The right kind of content for a physicalist about color

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Abstract: Color experiences have representational content. But this content need not include a propositional component, particularly for reflectance physicalists such as Byrne & Hilbert (B&H). Insisting on such content gives primacy to language where it is not required, and makes the extension of the argument to nonhuman animals suspect.

As a materialist and a color realist, I find much in Byrne & Hilbert's (2003; henceforth B&H) article to agree with. I do find one issue to be unsatisfying, however. This is their view of the representational content of color experience.

The particular problem with B&H's view is that part of the content of color visual experience is a proposition. For example, according to the authors, when I reach to pick a lemon from the tree in daylight, part of the content of my visual experience is a proposition something to the effect that "there is a yellow object hanging from the branch." The problem is that there is no need of such content for a reflectance-based view of physicalism about color. Indeed, insisting on such content gives primacy to language where it is not required, and makes the extension of the argument to nonhuman animals suspect.

A physicalist about color does not need propositional content in order to account for the content of experience. When experiencing a color, the physical property which is identified with the color – reflectance – is all that is needed for the content of an experience of that color (Dretske 1995; Tye 1995). Stripped to its most basic form, when I experience the yellow of the lemon, I experience the physical property yellow (the reflectance). The content of my experience is this property. There are thus only two physical properties in play here: the experience in my head, and the property yellow. I experience yellow; yellow is the content of my experience (Skokowski 2002). No propositional content is called for, since the property of yellow reflectance exemplified by the lemon *is* the content of the experience.

Later in their article (sect. 3.3), the authors argue for the plausibility of color vision in other animals. But surely we cannot attribute propositional content to the representational content of the color experience of other organisms. Assuming that such animals do not have language, how could propositional content ever be a part of their experiences of color? The most satisfying explanation for a reflectance physicalist surely must be that the contents of color experiences for nonhuman animals are real, physical colors (reflectances) in the world, not abstract objects such as propositions, which in any case are not accessible to beings without language. In my view, the authors should embrace their physicalism wholeheartedly, and accept that color contents, and experiences, are real properties of the world in their own rights. They should reject the appeal to propositional contents as a part of the content of color experience, much as they rejected the sense data view, and for similar reasons: both are epiphenomena that serve no causal or explanatory purpose for a physicalist.

Physicalism plus intentionalism equals error theory

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Abstract: Byrne & Hilbert (B&H) combine physicalism about color with intentionalism about color experience. I argue that this combination leads to an "error theory" about color experience, that is, the doctrine that color experience is systematically illusory. But this conflicts with another aspect of B&H's position, namely, the denial of error theory.

Part of what is appealing and distinctive about the position advanced by Byrne & Hilbert (2003; henceforth B&H) is the combination of a certain sort of physicalism about color with intentionalism about color experience. But one can argue that this combination leads naturally to an "error theory" about color experience! If this argument is sound, we may conclude, contrary to the main thrust of B&H's article, that there is an element of truth – I do not say it is the whole truth – in the Gallillean view that color is an illusion.

Suppose I am looking at a tomato in good light. In that case, as B&H make clear, the world seems to me to be a certain way. And, as they also point out, I may go on to ask whether the world is in fact the way that my experience presents it as being. This question implicitly distinguishes two possible worlds, without prejudicing whether we may ultimately identify or differentiate between them: (1) the visual world, the world that is presented to me in visual experience, and (2) the actual world, the world as it really is. From this point of view, the error theory about color experience says that, in a certain systematic sense having to do with color, the visual world is different from the actual world. So when I say that intentionalism and physicalism combine to yield the error theory, I mean that, if these positions are both true, the visual and actual worlds *are* different in this sense – that is, in relation to color (rather than, e.g., shape) and the difference is systematic (rather than haphazard).

But what is the argument for this conclusion? Well, to say that physicalism about color is true, is to say that it is true in the actual world. This gives us our (truistic) first premise:

P1. If physicalism is true, physicalism is true at the actual world.

Of course, to say that physicalism is true in the actual world is not to say that it is true in the visual world, in view of the possibility that the two worlds diverge. This then raises the question: What theory of color is true for/in the visual world? From the perspective of intentionalism, this last question is about which theory of color is best suited to tell the truth, not about the nature of colored objects, but about the phenomenology of color experience.

There would seem to be three possibilities here, corresponding to the three (realist) theories of color distinguished by B&H. (I regard the ecological view as a version of dispositionalism and so will not discuss it explicitly.) The first possibility is that physicalism is true for the visual world. But this is extremely implausible. To say that physicalism is true for or in the visual world is to say that the physical nature of colors – assuming them to have a physical nature – is evident to one simply on the basis of experience; or, at any rate, that it could become evident given only experience and sufficient reflection and suggestion. But even physicalists – those who think physicalism is true in the actual world – don't think that the physical nature of colors is evident in this sense. So physicalism is not true at/for/in the visual world.

The second possibility is that dispositionalism is true for/in the visual world. But this too is implausible, for related reasons. To say that dispositionalism is true for/in the visual world is to say that the dispositional nature of colors – assuming them to have a dispositional nature – is evident to one simply on the basis of experience, or that it could become evident given only experience and sufficient reflection and suggestion. But even dispositionalists –

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those who think dispositionalism is true at the actual world – don't think, in general, that the dispostional is evident in this sense. (Langsam 2000 is a counterexample to this generalization; but see Byrne 2001 for criticism.) So dispositionalism too is not true for/in the visual world.

The third possibility is that primitivism is true for/in the visual world. This is in fact an extremely plausible thesis. Even physicalists about color often say things which suggest – in our terms – that primitivism is true at the visual world:

> [it] is surely right that, for example, the sensible quality of redness looks to be an intrinsic (non-relational) property of certain surfaces. Phenomenally, the primary and secondary cannot be separated . . . [T]he secondary qualities appear as lacking in "grain" . . . So much for the way it seems. (Armstrong 1987 in Byrne & Hilbert 1997, pp. 36–37)

If we suppose that primitivism is true at the visual world, we now have our second premise, which is intended to be true on the basis of phenomenology:

> P2. If intentionalism is true, primitivism is true in/for the visual world.

If we assume in addition that the truth of primitivism in a world excludes the truth of physicalism in that world (and vice versa), it follows from P1 and P2 that the visual world does not coincide with the actual world. But that is simply to say that the error theory is true.

This argument refutes neither physicalism about color nor intentionalism about color experience, or their conjunction. It is open to physicalists and intentionalists to say that color experience is misleading in various ways (e.g., Thau 2002). But B&H are intentionalists and physicalists who say that color experience is not misleading; indeed, for them, color realism is true for that very reason. In sum, their color realism stands in conflict with their physicalism about color and their intentionalism about color experience.

Authors' Response

Color realism revisited

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Abstract: Our reply is in four parts. The first part, R1, addresses objections to our claim that there might be "unknowable" color facts. The second part, R2, discusses the use we make of opponent process theory. The third part, R3, examines the question of whether colors are causes. The fourth part, R4, takes up some issues concerning the content of visual experience.

Our target article had three aims: (1) to explain clearly the structure of the debate about color realism; (2) to introduce an interdisciplinary audience to the way philosophers have thought about the issue; (3) to argue that colors are certain sorts of physical properties ("productances").

We are very grateful to the commentators in this continuing commentary for their criticism and constructive suggestions.

R1. Ordinary intuitions and unknowable color facts

As **Dennett** notes, the target article emphasizes that the problem of color realism is not about color words, or the folk category of color. As we conceive it, the problem concerns certain properties that are represented by the human visual system and those of a variety of other animals. However, Dennett thinks that our methodology does not fit happily with the touted "scientific" nature of the problem: We place too much weight, he claims, on "ordinary intuitions about color."

But, in fact, we do not place any weight on ordinary intuitions about color. (**Dennett** himself seems to think that ordinary intuitions should be accorded *some* weight: An account of color should be "largely consonant with everyday usage." We disagree.) Dennett's one example of our alleged reliance on ordinary intuitions is our rejection of the idea that there are different kinds of colors: surface, volume, and illuminant (see sect. 3.1.2 of the target article). Although the ordinary person might well find this idea odd – tomatoes, glasses of Burgundy, and stoplights are all red! – this was not our reason for rejecting it. Rather, our objection was that surfaces, volumes, and illuminants can all look the same in respect of color – a fact which might be revealed by training an animal to press a bar in the presence of a type of light, and then noting that the animal generalizes the rule to certain surfaces and volumes. This fact is best explained, we said, by supposing that there is a common property visually represented. Whether or not we are right about this, the argument certainly does not make any appeal to ordinary intuitions.

Dennett suggests that our claim that it may be unknowable whether a chip is unique green is "counterintuitive." He might mean by this that ordinary intuition rules out such a possibility (thus implicitly accusing us of arbitrarily picking and choosing between intuitions), but we doubt it, because surely ordinary intuition has no clear opinion on the matter. In any case, whether or not Dennett himself is resting any weight on ordinary intuition here, he offers another consideration entirely. Dennett claims that the conclusion that there are no unknowable color facts follows from the "coevolutionary coordination of color vision and reflectance properties," and obviously this argument does not appeal to everyday usage or the opinions of the folk.

Dennett does not spell out his argument in any detail; still, it is instructive to set out an argument that is naturally suggested by his remarks. (We emphasize that we are not attributing this argument to Dennett. See also Dennett 1991, pp. 375–83, which we lack space to discuss.) (1) Evolution fine-tuned the colors of certain fruits so they were readily visible to certain fruit eaters, and evolution also fine-tuned the fruit eaters' color vision (in particular, the spectral sensitivities of their cone pigments) to detect the colors of the fruits (see Regan et al. 2001). Hence: (2) in normal conditions the fruit eaters will correctly perceive the colors of fruits. Hence: (3) in normal conditions the fruit eaters will correctly perceive the colors of things generally. Hence: (4) our claim that most people misperceive unique green chips in normal conditions is incorrect.

There are three main problems with this argument, apart from the fact that the coevolution hypothesis is not an established fact. First, and perhaps most seriously, on any remotely defensible elaboration of (1), it does not imply (2). The most (1) could imply is that the fruit eaters are by and large correct: any evolutionary fine-tuning of fruits and cone pigments would leave plenty of room for minor misperceptions of determinate shades, and minor variations between individuals (see sect. R2.6 of our Response to the

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