

A posteriori primitivism

Michael Watkins

Published online: 3 April 2009
© Springer Science+Business Media B.V. 2009

Abstract Recent criticisms of non-reductive accounts of color assume that the only arguments for such accounts are a priori arguments. I put forward a posteriori arguments for a non-reductive account of colors which avoids those criticisms.

Keywords Color · Primitivism · Alex Byrne · David Hilbert · Sydney Shoemaker

Visual experience represents objects as colored and it represents colors as monadic non-dispositional properties of objects. Moreover, visual experience is veridical, much of the time, or at least we have insufficient reason to deny that it is. But colors are not identical to the properties identified by science as causally responsible for color experience. Therefore, even though colors surely supervene on the properties of interest to color science, and they might even be realized by those properties, they are identical neither to those properties, nor to some property constructed out of those properties. Or so claims Primitivism.¹

¹ As 'Primitivism' is commonly used in the color literature, to be a primitivist is to hold only that colors are not reducible to other properties. As such, Primitivism is neutral between Realism and Anti-Realism about colors. Not so here.

Versions of this paper were read at a conference on color at Florida State University, the Metaphysics and Epistemology Conference in Dubrovnik, the Dalhousie University Philosophy Department, and the Auburn University Philosophy Department.

M. Watkins (✉)
Auburn University, 6080 Haley Center, Auburn, AL 36849-5210, USA
e-mail: watkigm@auburn.edu

M. Watkins
Dalhousie University, Halifax, Canada

The details vary from primitivist to primitivist, but most primitivists endorse something like the above argument.²

Of course, similar arguments are common in other areas of philosophy, most notably in the philosophy of mind: we are confident that humans and other animals are sometimes in pain; but being in pain is not identical to the properties (states, etc.) identified by neuroscience as the physical correlates of pain experience. Therefore, although being in pain surely supervenes on the properties of interest to neuroscience, and it might even be realized by those properties, it is identical neither to those properties, nor to some property constructed out of those properties. Or so claims Non-Reductive Realism. Non-Reductive Realism has been popular amongst philosophers of mind at least since Putnam. Indeed, given the popularity of non-reductive accounts in other areas of philosophy, Primitivism's minority status is hard to explain. And given that many of the reasons commonly issued in support of Non-Reductive Realism in other areas of philosophy—e.g., the likelihood that certain favored properties are multiply-realizable by the physical—are equally applicable to colors, the resistance to Primitivism seems little more than a prejudice.³

In this paper, I argue for Primitivism against Reductive Physicalism (RP).⁴ My aim is not to defend Primitivism against all alternative accounts of color. Specifically, I will contend neither with dispositional accounts, nor with their functionalist cousins.⁵ I also will not argue against error-theories about colors, at least not directly. I will, however, put forward a version of Primitivism that is, I contend, preferable to RP. Towards that end, I will respond to recent criticisms of Primitivism from Alex Byrne and David Hilbert (2007), criticisms that, I show, leave at least some versions of Primitivism untouched. I will then argue that, given our best evidence about the causes of color experience, RP is implausible. The sketch of that argument is that RP cannot avoid treating colors as disjunctive properties, and it is implausible to treat colors as disjunctive properties. Indeed, to my mind, reductive physicalists are mostly in denial about the problems for disjunctive properties. Were there no plausible alternative, perhaps they could not be faulted. I intend to find fault.

Before beginning in earnest, some clarification. First, 'Primitivism' is often defined such that it is neutral between realism and anti-realism about colors. In this paper, Primitivism is understood as a realist position. More specifically, as 'Primitivism' is used here, Primitivism is committed to the view that objects are colored and that objects typically have the colors that ordinary human visual perception represents

² Philosophers explicitly endorsing Primitivism include John Campbell (1997), Josh Gert (2008), and Michael Watkins (2002, 2005). Other philosophers sympathetic with Primitivism include Justin Brookes (1997) and Stephen Yablo (1995).

³ The prejudice is aided by the label. Reductive Physicalism, in the color literature, is commonly referred to as "Physicalism." Primitivism about colors, then, being opposed to what is termed Physicalism, is sometimes taken to be to color what Cartesian Dualism is to the philosophy of mind. Contemporary versions of Primitivism, however, are better compared with non-reductive realism. See Watkins (2005) and Byrne and Hilbert (2007) for more on this point.

⁴ As it is typically used in the color literature, 'Physicalism' and 'Reductive Physicalism' are synonymous. Not so here. I count Byrne and Hilbert (1997a, b, 2007), J.J.C. Smart (1975), and Frank Jackson (1996) as representative of RP.

⁵ Cf. Jonathan Cohen (2004).

them as having. Second, I take Primitivism and RP to be “Primary Quality” views about colors. Both Primitivism and RP, as I will understand them here, treat colors as the categorical grounds of dispositions to look colored.⁶ Third, I take Primitivism to be compatible with what is commonly referred to outside the color literature as “Non-Reductive Physicalism,” and it is a version of Non-Reductive Physicalism (NRP) that I will defend. RP, then, is understood as the view that colors are identical to the properties of interest to color science, properties describable non-chromatically, or to properties constructed out of those properties. Fourth, I take the colors to include red, yellow, green, blue, black, grey, and white, as well as the more determinate shades scarlet, aqua, ochre, and slate-grey, but I remain neutral as to how determinate the colors might be. In particular, I remain neutral on whether the ultimately determinate colors are discernible by ordinary human or non-human perception. Last, I take Primitivism to be committed to the view that at least some colors are not identical to any property of interest to physical science. It may seem wildly implausible to think that some colors are identical to physical properties and others are not, and perhaps it is. In any case, Primitivism, as I will understand it, requires only that some colors are not identical to the properties of interest to color scientists. Perhaps better: I allow that Primitivism might be true of some colors, but not others. And I should add: I hold that Primitivism is true for all of the colors that anyone can see.

1 Varieties of primitivism

1.1 A priori primitivism or a posteriori primitivism

I claimed that the motivation for Primitivism is the purported fact that the colors are not identical to any of those properties identified by science as causally responsible for ordinary color experience. But we might reach that conclusion by two very different paths.

The first path is to argue that it is *a priori* impossible that colors are identical to those physical properties. For example, such a primitivist might argue that even if some physical property makes all of the causal contributions associated with some color, it might not have. If that color makes that causal contribution necessarily, whereas the physical property makes that contribution contingently, then, by Leibniz’s Law, that color is not identical to that physical property. Or, perhaps, such a primitivist might argue that the nature of colors is revealed by color experience whereas the relevant underlying physical features are not. Either way, the primitivist might argue, the question of whether colors are physical properties is not held hostage to whatever science discovers since no physical property could have the favored feature. Call this the *a priori* path to Primitivism.

⁶ My usage of ‘Primitivism’ here is more restricted than is common. Not only do I not include error-theories, I do not include all realists who are commonly treated as primitivists. Colin McGinn (1996), for example, argues that color supervenes on the disposition to look colored. Since, for McGinn, colors are reducible neither to dispositions nor to the physical properties that are the grounds for those dispositions, his account is commonly treated as a version of Primitivism. Since his account does not treat colors as the grounds for those dispositions, McGinn is not a primitivist as ‘Primitivism’ is understood here.

The second path is to argue that, as an empirical fact, the colors are not identical to physical properties. For example, such a primitivist might allow that, prior to the work of color science, for all we knew, colors are physical properties, but we now have reason to believe that no physical property makes the causal contributions made by colors. Or, perhaps, such a primitivist might argue that we now have reason to believe that the physical properties that realize colors do not bear the similarity relationships that colors bear to one another. For the primitivist taking this path, Primitivism is the default realist position about colors, at least for those wishing to maintain that colors are primary qualities. If the colors can be identified with physical properties, then so be it. If not, Primitivism takes the throne. Call this the *a posteriori* path to Primitivism.

These paths to Primitivism are mirrored in the philosophy of mind. Saul Kripke (1972), for example, famously argues that even if pain is not multiply realizable, even if there is some physical explanation common to all instances of pain in the actual world, the physical properties appealed to in that explanation will have modal features different than those had by pains. Kripke takes the *a priori* path to Non-Reductive Realism about pain. Sydney Shoemaker (2007), in contrast, claims only that it is empirically implausible to think that all instances of pain might be explained by the same physical properties, and so, he concludes, pain is not identical to those physical properties. Shoemaker takes the *a posteriori* path to Non-Reductive Realism about pain.

Although the two paths to Primitivism, and to Non-Reductive Realism more generally, are clearly distinct, they might be compatible. And, undoubtedly, not all arguments for Primitivism fit neatly into either category. Indeed, perhaps none do. Here I will take the *a posteriori* path to Primitivism, or at least a path that is more *a posteriori* than most. I remain neutral here on whether there is a viable *a priori* argument for Primitivism.

1.2 Metaphysical determination or nomological coextension

Another useful way to group versions of Primitivism is by how they treat the relationship between colors and the physical properties on which they supervene. Although it is possible to be a primitivist and not hold that colors supervene on the physical properties of objects, to my knowledge this is not a position that any contemporary primitivist takes seriously. Primitivists, these days, are generally non-reductive physicalists about colors. However, some versions of Primitivism hold that colors are metaphysically determined by those physical properties, while others hold only that colors and certain physical properties are nomologically coextensive. When it is important to treat these views separately, I will follow Byrne and Hilbert in referring to the former view as ‘MD Primitivism,’ the latter as ‘NC Primitivism.’

2 Arguments against primitivism

2.1 The argument against MD primitivism

Byrne and Hilbert contend that the best way to motivate Primitivism undermines the claim that colors are metaphysically determined by physical properties. The best

argument that Byrne and Hilbert can imagine for Primitivism assumes that the connection between colors and the physical properties correlated with them is merely contingent. We can, according to those thus motivated, imagine that something has the relevant physical property but fails to have the color property. The argument that Byrne and Hilbert imagine, then, takes the *a priori* path discussed earlier. But this motivation for Primitivism, Byrne and Hilbert argue, undercuts the claim that colors are metaphysically determined by physical properties. If colors are metaphysically determined by physical properties, then it is not possible that the relevant physical properties are instantiated where the colors are not. And so this motivation for Primitivism cannot motivate this version of Primitivism. MD Primitivism, then, requires some other motivation.

I note in passing that this argument does not close the door on the MD Primitivist wishing to take the *a priori* path. Such a primitivist might, for instance, argue that even if it is not possible that the relevant physical properties be instantiated while the color property is not, the reverse possibility remains: colors might be instantiated in some possible world even if none of the physical properties that determine the colors in our world are instantiated there. The MD Primitivist might also argue that even if the colors and the relevant physical properties never diverge in any possible world, the relevant physical properties do not (or could not) have the features necessarily had by colors. For instance, the colors bear certain similarity and difference relations to one another that, it might be argued, the relevant physical properties do not (or could not) bear to one another.

Regardless of whether these replies have merit, a primitivist has available another reply that I find more compelling. A primitivist who holds that colors are metaphysically determined by physical properties will likely be motivated, in part, by a view about how properties are individuated and by how the supervening properties are related to the physical properties on which they supervene. At least, I am thus motivated. On the account that I favor, the properties of concrete particulars are individuated by the causal contributions that their instantiations make.⁷ If we individuate properties by their causal contributions, then the way to think of how colors are related to the physical properties on which they supervene is to think of the instantiation of a color as contributing a proper subset of the causal powers contributed by the instantiation of any of the physical properties on which it supervenes.⁸ Here's an outline of that account. If properties are individuated by their causal contributions, then the different physical realizers of a color must contribute different causal powers. But since all such realizers realize the same color, the causal powers that they contribute must overlap. They all must, for instance, contribute the power to bring about the same color experience for relevant observers under relevant conditions.

⁷ Here I follow Sydney Shoemaker (1998, 2007). It might be thought that there is tension between treating colors as the categorical grounds of dispositions to look colored while individuating properties by the causal powers that they contribute. On my view this tension is the result of confusing the individuating (or identifying) conditions of a property with what that property is. See Watkins (2002, 2005) for more on this distinction.

⁸ See Watkins (2002) for such a theory. Shoemaker's (2007) is the manifesto for this approach, showing how the strategy might be developed and applied across a broad range of cases.

An interesting feature of this account is that it rejects token–token identity claims and so avoids a particular problem that plagues such accounts. If the instantiation of a color contributes a subset of the causal powers contributed by its physical realizer, then it cannot be that that instantiation of a color is identical to that instantiation of its physical realizer. If they were identical, then their causal contributions would be the same. And if their causal contributions were always the same, then it is hard to see how colors could contribute anything. On the realization view that I favor, although it will be true that no instance of a color makes a causal contribution that is not also made by its physical realizer, the contributions are not the same; the physical realizer contributes more. Compare: something's being cubical realizes its having a square-side; and the property of being cubical contributes everything contributed by the property of having a square-side, but it contributes more. This explains why appeals to colors and other multiply realizable properties will sometimes be explanatorily more salient than appeals to their realizers. At times we are interested only in what the instantiations of colors cause, for example, and not the more general causings of their physical realizers.

None of this, so far, distinguishes between MD Primitivism and NC Primitivism. The NC primitivist taking the approach sketched above would presumably claim that a property's causal features are partly the result of the laws of nature that obtain in our world. Such a primitivist would then conclude that the instantiation of one property realizes the instantiation of another as the result of those laws. Given that it is nomologically necessary that that property have the causal features that it has, it is also nomologically necessary that the instantiation of that property realizes the instantiation of any property that contributes a proper subset of the causal powers that the instantiation of the realizer property contributes. For an MD primitivist taking the approach that I recommend, the properties have their causal features necessarily. On such a view, the laws of nature are determined by the properties themselves.⁹ On such an account, colors are metaphysically determined by their physical determinates in virtue of its being impossible that anything having the relevant physical property fails to have the relevant color property. And it is impossible because it is impossible for the instantiation of any physical property to make the causal contributions that it necessarily makes without making the causal contributions necessarily made by the instantiation of the relevant color property.

Of course, there is nothing about this account alone that requires its adherent to accept Primitivism. The argument for Primitivism is partly metaphysical and partly empirical. The metaphysical part: monadic non-disjunctive properties are best suited to play the appropriate causal roles assigned to colors. The empirical part: no (non-chromatic) physical property plays those roles. I'll have more to say about this motivation later, but this much about my commitments should be clear. If there is a physical property that makes all and only the causal contributions made by some color, then we have reason to conclude that that color is that physical property. If there isn't, then that color is not identical to a physical property. Whether colors are reducible to (other) physical properties, then, is to be settled largely *a posteriori*.

⁹ See Shoemaker (1998, 2007).

2.2 The argument against NC primitivism

If colors and physical properties are merely nomologically coextensive, then presumably things might be physically as they are here but chromatically different. But then, Byrne and Hilbert argue, our seeing colors depends upon a pre-established harmony between colors and physical properties. Here's why, according to Byrne and Hilbert. Let P^g be the physical property identical to greenness, according to RP. Then, according to the primitivist holding that colors and those physical properties are merely nomologically coextensive, there is some possible world in which something has P^g but is not green. But then we can imagine a permuted world where the laws governing the physical properties are as they are here, but where the chromophysical laws are different. In such a world, there might be creatures very much like us who evolved much as we did. They respond to objects having P^g as we do. But in that world, due to the chromophysical laws obtaining there, P^g objects are red. These creatures will have the same nonrepresentational experiences that we have when confronting objects having the same physical properties, but they will not have veridical experiences of green objects. Since evolution is not sensitive to differences in chromophysical laws, that we are fortunate enough to see the true colors of objects would seem to depend upon a cosmic accident or some kind of preestablished harmony.

The argument above assumes that if colors are not identical to the physical properties with which they nomologically covary, then the laws governing them cannot be determined by the physical laws. The assumption is unmotivated. Indeed, on the view that I propose, it is false. Assume that some color, C, nomologically supervenes on the physical properties P and Q. On the NC-primitivist version of the view, any instantiation of P (or Q) will contribute the causal powers that it contributes as the result of the physical laws that govern our world. Let $\{p_1, p_2, p_3\}$ be the set of causal powers contributed by any instantiation of P in any world governed by the physical laws that govern ours. Let $\{p_1, p_4, p_5\}$ be the set of causal powers contributed by any instantiation of Q in any such world. Since C nomologically supervenes on P and Q, the causal powers contributed by an instantiation of C must be contributed whenever P is instantiated (or Q is instantiated) in any nomologically possible world. And so, presumably, the powers contributed by any instantiation of C will be a proper subset of those contributed by P and those contributed by Q. In our imagined case, any instantiation of C in such a world will contribute p_1 . And the instantiation of C will be necessitated by the instantiation of P (or by the instantiation of Q) in virtue of the laws of nature being what they are. On this view, any instantiation of P or any instantiation of Q will realize the instantiation of C given that the laws of nature are as they are. The laws of nature, then, determine the chromophysical laws. No cosmic accident or preestablished harmony is required.¹⁰

¹⁰ It might be objected that what I have claimed in defense of Primitivism might be thought compatible with RP. I remind the reader that, at this point, my aim is only to defend Primitivism against certain objections. I am not, yet, attempting to argue for Primitivism against RP. That will come later, in §3.

2.3 Worries about animals

It is now certain that most animals do not see the world as colored just as we do. Many objects that appear uniformly colored to us under normal lighting conditions will not appear uniformly colored to other animals. Some animals are sensitive to differences in light to which we are not sensitive. Some animals have more than three cone-types, some fewer. Some animals with three cone-types have cones with sensitivities different than the sensitivities of ours. And so it is *prima facie* plausible to conclude either that these animals see objects as having different colors than we see them as having, or that they do not see objects as colored but instead see objects as having other non-color properties. Byrne and Hilbert argue that neither option is available to the primitivist. To understand why they think this, we need to take a brief detour.

Much of the controversy over the nature of colors, especially as that debate concerns Primitivism, has concerned whether or not the nature of colors is revealed to us by ordinary color perception. Revelation, as Byrne and Hilbert understand it, consists in the conjunction of two theses. First, if it is in the nature of the colors that p , then after careful reflection on color experience it seems to be in the nature of the colors that p . Second, if after careful reflection on color experience it seems to be in the nature of the colors that p , then it is in the nature of the colors that p . This talk about the nature of colors is, to my mind, misleading. Primitivism is not committed to the view that all necessary facts about color are revealed by ordinary color perception. On this point, I assume, Byrne and Hilbert agree, since otherwise MD Primitivism would not count as a version of Primitivism. I will assume that Byrne and Hilbert have roughly this in mind: first, if some color is identical to some property, then we can know by color experience alone that that color is identical to that property; second, if color experience makes it seem to be the case that some color is identical to some property, then that color is identical to that property.¹¹

Byrne and Hilbert argue that Primitivism and Revelation are inseparable. Roughly, the reason is this. If Revelation is true, then, since it is not revealed to us by color experience that colors are identical to underlying physical properties, it follows that colors are not those underlying physical properties. If Primitivism is true, if colors are not identical to underlying physical properties, then it is plausible that color experience reveals to us everything there is to be revealed about what colors are.

For our purposes, the critical claim is this: if Primitivism is true, then, if it is in the nature of colors that p (i.e., if the colors are identical to certain properties), then after careful reflection on color experience it seems to be in the nature of colors that p (i.e., the colors seem to be identical to those properties). It is this claim that drives Byrne and Hilbert's argument that Primitivism cannot hold that animals see objects as having colors that are different than those that we see objects as having. For non-human animals see objects as colored, then, presumably, the colors that non-human animals see objects as having share some nature in common with the colors

¹¹ That this is roughly what Byrne and Hilbert (2007) have in mind is further evidenced by their defining Primitivism as the view that colors are not identical physical properties.

that we see objects as having. Why else say that they see objects as *colored*? But this shared nature is certainly not revealed to us by ordinary color experience. Thus, according to Byrne and Hilbert, allowing that the properties that non-human animals see objects as having share some nature in common with the colors that we see objects as having is tantamount to abandoning Primitivism.

But claiming that animals do not see objects as colored is not, according to Byrne and Hilbert, plausible. For if the primitivist claims that non-human animals see objects as having only non-color properties, then it is a mystery as to how creatures with similar mechanisms see objects as having unrelated properties. As they put it, “although there may be similarities in the causal pathways underlying the perception of goldfish c-properties, howler monkey c-properties, and so on, the c-properties perceived by different species are not fundamentally related. This version implausibly supposes that different types of animals use similar physiological machinery, sensitive to very similar types of environmental features, to detect unrelated properties” (p. 30).

On the view that I favor, the causal contributions of any instantiated color property will be a proper subset of the causal contributions of any of its instantiated realizers. If Paul likes red and Susan likes only scarlet, then something’s being scarlet will be causally relevant for both Susan’s and Paul’s liking it (since nothing could be scarlet and not be red). Something’s being red, however, is causally relevant only for Paul’s liking it. Likewise, if the physical properties P and Q are among the properties on which being scarlet supervenes, then something’s having P will result in that object’s looking scarlet to ordinary perceivers under normal conditions. The same goes for something’s having Q. Of course, P and Q, although they make some of the same causal contributions, must make different contributions as well. Otherwise, there would be no reason to think that we have two properties (P and Q) instead of one.

Now let’s return to the challenge raised by Byrne and Hilbert. It does not follow from my view that non-human animals see objects as colored. Nor does it follow that they do not. What does follow, I contend, is that it doesn’t much matter. On my view, the colors that we see objects as having and the properties that other animals see objects as having are realized by (at least many of) the same physical properties. Their “shared nature” is explained, then, by appeal to those physical realizers. Call these physical properties “colors,” if you like, although no one and no animal is likely capable of visually discriminating them. And remember that these physical properties, too, are realized by yet further properties. Somewhere along the way, no one will be inclined to say that we are speaking of colors. Where? My advice: when given the choice between trying to answer that question and getting another cappuccino, it’s time to visit the barista.

Byrne and Hilbert believe that the primitivist can give no adequate answer to the question What do the colors that we see and the colors that animals see essentially share? Part of the reason, I surmise, is that they assume that whatever it is it will be plausibly thought of as a color, and if it is, then it is certainly not a feature that is revealed by color experience. This reasoning makes two assumptions that I reject. The first assumption is that if Primitivism is true of some color, then it must be true of all colors. But it is possible that one and only one physical property determines

some shade of color, especially if we allow that the ultimately determinate shades are very fine-grained (more fine-grained than either we or other animals are able to discriminate), while other colors have many physical determinates. If we individuate the properties of concrete particulars by their causal contributions, then it will be reasonable to conclude that the former color is identical to some physical property; the other is not. And it is appeal to the former (whether we choose to call these colors or not) that explains how our colors and those of other animals are essentially linked. The second assumption is that Primitivism and Revelation are not only necessarily linked, but also that the latter must be the support for the former. And this is to assume that we must settle the question of whether Revelation is true prior to determining the nature of colors. But even if Primitivism and Revelation are intricately linked, even if Primitivism is true if and only if experience reveals to us the nature of color, Primitivism does not require that experience reveal to us that it has revealed to us the nature of colors. If we discover that some color is not identical to any non-chromatic physical property, then we can conclude that experience reveals to us the nature of that color. We will have discovered that no non-chromatic property of interest to science is that color. Color experience, then, is our only access to that color. Otherwise, color experience does not reveal everything about the nature of that color; science then has more to tell us about what that color is, and not just what physical properties realize that color. Color experience, then, even if it is revelatory, does not reveal that it is.

3 The nature of colors

Byrne and Hilbert assume that the only path to Primitivism is the *a priori* path. Why? Here's a diagnosis. If Primitivism is merely the default view, if it is the view that wins only if no non-chromatic physical properties are found to identify with colors, then Byrne and Hilbert are prepared to declare that the relevant non-chromatic physical properties are at hand. Colors are, according to Byrne and Hilbert, spectral reflectance properties. But the mere fact that colors covary with spectral reflectance properties, if indeed they do, does not license our identifying colors with spectral reflectance properties. First, notice that the spectral reflectance properties with which Byrne and Hilbert would identify with colors are disjunctive properties. There is no non-disjunctive spectral reflectance property that covaries with a particular shade of yellow, for instance. An object that reflects light only in the so-called red and green ranges might be indiscernible in color to an object that reflects light only in the so-called yellow and blue ranges, at least for normal human observers under normal viewing conditions. Both objects might, for instance, appear the same shade of yellow to normal humans under all normal lighting conditions. Presumably, both objects are yellow, and they are according to Byrne and Hilbert. For Byrne and Hilbert, something's being yellow is its having one of a set of spectral reflectance properties. But even if we countenance such properties, and even if such a property covaries with yellowness, more work is required before we conclude that yellowness is this disjunctive property. After all, other physical properties also covary with yellowness, at least if we are willing to countenance

disjunctive properties e.g., the property of having one of the many intrinsic physical properties that realize the spectral reflectance properties (which, in turn, constitute the disjunctive spectral reflectance property that Byrne and Hilbert favor).¹²

Since the empirical evidence underdetermines which properties the colors are, we cannot determine what colors are simply by doing more science. Metaphysical considerations must be invoked. But now that we have ascended from physics to metaphysics, we can inquire into whether these disjunctive spectral reflectance properties are best suited to do the causal work. More generally, we can ask whether colors are best thought of as the property of having some non-chromatic physical property or another, or whether they are best thought of as properties that are realized by, but not reducible to, those non-chromatic properties.

Let x and y be two objects, and let P and Q be two non-disjunctive properties. If we allow for disjunctive properties and place no constraints on them, if there is such a property for every disjunctive construction we could make, then x and y have a property in common regardless of whether the contributions of P and Q are related or not: the property of having P or Q . But then it would seem that this “property” is merely a logical construct. At the very least, it does not contribute to the causal order. Where we are tempted to treat objects having P or Q as having a property in common, it is where the causal contributions of P and Q overlap. It is because anything having P or Q will, under certain circumstances, bring about some of the same effects. But this reason, it seems to me, is a reason to think that every object having any one of these properties has a non-disjunctive property in common. To see why, consider the following cases.

Case 1. Imagine that there is some property D having P and Q as its only realizers. And imagine that we can construct a machine capable of detecting the instantiation of D . Now there are two ways such a machine might do this. It might do this by being responsive to some causal power contributed by the instantiation of D , and so responsive to some causal feature that belongs to each of P 's and Q 's causal profiles. Alternatively, it might have a mechanism responsive to the instantiation of P , and another responsive to the instantiation of Q . On the second alternative, although the machine might well inform us of the instantiation of D , it is not, I take it, responsive to D . The instantiation of D is not causally efficacious with respect to this machine's outputs. What is causally efficacious with respect to this machine are the instantiations of P and Q .

Case 2. Imagine, now, that D is purely disjunctive. That is, the properties the having of which constitute the having of D share no causal features. Then, the only way to construct a machine capable of detecting D is to construct a machine that is responsive to P and Q in different ways. Were this the case, I take it, D would make no causal contributions and we have good reason to treat D as a mere logical construction. D , then, is not a property that we should countenance. To have “ D ” would just be to have P or to have Q .

To distinguish between Case 1 and Case 2 is to distinguish between a case in which ‘ D ’ denotes a real property and one in which it does not. And to distinguish

¹² Jackson (1996) argues for this position. Gert (2008) argues that the plethora of options available to the physicalist itself favors Primitivism.

between the two machines in Case 1 is to distinguish between a machine that is responsive to a particular property and a machine that is responsive only to the realizers of that property. But it isn't clear how there could be these differences if D in case 1 is thought of as a disjunctive property. In case 1, what is the causal contribution of D, if D is a disjunctive property? Just this: the causal contribution of either P or Q. If D is a disjunctive property, then D's contribution is just its realizer's contribution. Any instantiation of D, then, would be identical to the instantiation of its realizer. And since both machines in Case 1 are responsive to those realizers, both machines would seem to be responsive to D if D is a disjunctive property. And this also suggests that, if D in Case 1 is merely a disjunctive property, then there could not be a metaphysical difference between D in Case 1 and D in Case 2. Of course, where the causal profiles of P and Q overlap (as they do in Case 1), knowing that either P or Q is instantiated is helpful for then, regardless of which property is realized, we will know something about the causal potential of whatever has either of those two properties. So there is an epistemological difference between Case 1 and Case 2. What we wanted, however, was a way to distinguish real properties from faux properties, and that requires the stuff of metaphysics.

My point might be further illustrated by thinking about an example of J.J.C. Smart's (1975). Smart, in defending disjunctive properties, has us imagine Smith who stands on his head whenever confronted with a tomato, rainbow, bulldozer, or archbishop. To explain Smith's behaviour, we might posit the property snarkhood which Smart introduces in this way: "snarkhood is the property which causes or which explains [Smith's] peculiar behaviour; it is the property such that it is a lawlike proposition that, if and only if Smith is presented with something possessing the property, then he stands on his head" (1975, p. 56). According to Smart, snarkhood is best thought of as a disjunctive property. It is the property of being a tomato or being a rainbow or being a bulldozer or being an archbishop. Smart claims that snarkhood is a perfectly respectable property and a property that will likely be of interest to both Smith and his psychiatrist. And certainly Smart is correct that appealing to snarkhood might be quite useful in predicting Smith's behaviour. But if appeals to snarkhood are to be truly explanatory, snarkhood cannot be the disjunctive property that Smart contends that it is, and our work above puts us in a position to see why.

Things might go different ways for Smith. Smith might have four problems, for example, instead of only one. He might have a peculiar reaction to tomatoes in virtue of their being tomatoes, rainbows in virtue of their being rainbows, and so forth. Alternatively, he might have his peculiar reaction in virtue of some non-disjunctive feature shared by tomatoes, rainbows, and so forth. Only in the latter case, I take it, would snarkhood be explanatory. Only in the latter case would snarkhood be causally efficacious with respect to Smith. Imagine that Smith's reaction to tomatoes, rainbows, bulldozers, and archbishops is the result of a peculiar allergy. Smith's psychiatrist is of no help. He needs a good allergist instead. Is snarkhood of interest to Smith's allergist? If and only if Smith's reactions result from a single allergen shared by all tomatoes, rainbows, bulldozers, and archbishops. If and only if Smith's reactions are caused by some non-disjunctive property shared by tomatoes, etc. Otherwise, I take it, the assumption that Smith is

responding to some feature shared by tomatoes, etc. is mistaken. Smith's reactions, of course, will be the same either way, but the causes of those reactions, and so the explanations of those reactions, will be importantly different. If all we care about is predicting what will happen to Smith, we have many options. We might even appeal to the "property" of being a tomato or a rainbow or a bulldozer or an archbishop. If what we care about is why Smith reacts as he does, if we want to explain and not just predict, if what we care about is treating Smith's ailment, our options are limited.

Now imagine Fred, who is fascinated by each particular shade of red. Every red object is, for Fred, an object of fascination, but not in virtue of its being red. Red objects also fascinate Tom, but Tom is fascinated with their redness. It may be difficult to discern the difference between Fred and Tom. Nonetheless, the causes of their behaviours will be different. When we turn to objects having a particular shade of redness, the instantiation of that particular shade of redness will be realized by the instantiation of some particular physical property in some cases, by another physical property in other cases, and so forth. Fred and Tom presumably see the object as having a particular shade of red. But to see it as having that particular shade of red is to see it as having something in common with other objects of the same color. To see it as having one or another of the relevant physical properties is to be responsive to those particular physical properties and not to some feature shared by everything having one of those properties. To be responsive to a disjunctive property is to be responsive disjunctively: it is to be responsive to an object in virtue of its having the one physical property or its having a second physical property or... But presumably that is not what Fred and Tom are responsive to, and if it were, if Fred and Tom are merely responding to all of the realizers of that color, then they are not responding to that object in virtue of its color.

The complaint that I have been raising against disjunctive properties is that the disjunctivist cannot distinguish between the causal potential of a property's instantiation and the causal potential of the instantiation of its realizer, nor can the disjunctivist distinguish between a "genuine" disjunctive property and a mere logical construct. Disjunctivists generally accept the burden of needing to distinguish genuine from artificial disjunctive properties. But it is, I think, a burden that they fail to shoulder. The approach taken by Smart, as well as by Byrne and Hilbert, is to isolate the genuine disjunctive properties by whether the disjuncts are relevantly similar, and especially with respect to their causal potential.¹³ But this suggestion places the (epistemological) cart ahead of the (metaphysical) horse. The advice is sound for determining whether there is a property. It helps us none at all in understanding how a disjunctive property could be that property, how it could do the work that color properties supposedly do. The disjunctivist has, in other words, provided us with additional reasons to be realists about the colors. And so, if colors are disjunctive properties, then we have good reason to think that there are disjunctive properties. But the only reason to conclude that colors are disjunctive properties is that we have no better alternative. Byrne and Hilbert have argued that

¹³ This is perhaps even more explicit in Jackson (1996).

we have none, or at least Primitivism is not among them. I have argued that their arguments fail.

4 Conclusion

What is required of a realist account of some color, red for example, is that it locate some feature, common to all red objects, the having of which is causally responsible for red objects appearing red. The traditional advantage of reductive physical accounts is that they appeal to features identified by science as causally responsible for color experience. The traditional disadvantage is that such accounts struggle to find a unifying feature, a feature shared by all objects of the same color. The traditional advantage of dispositional accounts is that they locate a unifying feature, a feature shared by all objects of the same color. The traditional disadvantage is that they struggle to show how that feature could play the required causal role. Disjunctive physical accounts attempt to locate a unifying feature. If objects of the same color fail to share some non-disjunctive physical property, they at least share the disjunctive property of having one or another of those non-disjunctive properties. But the advantage, if it is gained, is gained at the cost of losing the previous advantage of identifying a property that plays the appropriate causal role.¹⁴

What is it, then, that all red things have in common such that they look red? Well, we might think that, at the very least, they are red. If nothing more can be said, then Primitivism stands ready to take the throne. Primitivism remains the default position.

Acknowledgments I thank the audiences at those talks for their many helpful comments. I am especially grateful to Justin Brookes, Alex Byrne, Joshua Gert, David Hilbert, Sydney Shoemaker, Louise Antony, Boran Bercic, Jody Graham, Kelly Jolley, Duncan MacIntosh, Sheldon Wein, and Richmond Campbell. I also thank an anonymous referee for several helpful comments.

References

- Brookes, J. (1997). The autonomy of color, in Byrne and Hilbert 1997a, pp. 191–225.
- Byrne, A., & Hilbert, D. (Eds.). (1997a). *Readings on color, volume 1: The philosophy of color*. Cambridge, MA: MIT Press.
- Byrne, A., & Hilbert, D. (1997b). Colors and reflectances, in Byrne and Hilbert 1997a, pp. 263–288.
- Byrne, A., & Hilbert, D. (2007). Color primitivism. *Erkenntnis*, 66, 73–105. doi:[10.1007/s10670-006-9028-8](https://doi.org/10.1007/s10670-006-9028-8).
- Campbell, J. (1997). A simple view of color, in Byrne and Hilbert 1997a, pp. 177–190.
- Cohen, J. (2004). Color properties and color ascriptions: A relationalist manifesto. *The Philosophical Review*, 113, 451–506. doi:[10.1215/00318108-113-4-451](https://doi.org/10.1215/00318108-113-4-451).
- Gert, J. (2008). What colors could not be: An argument for color primitivism. *Journal of Philosophy*, 105, 128–155.
- Jackson, F. (1996). The primary quality view of color. *Philosophical Perspectives*, 10, 199–219.
- Kripke, S. (1972). *Naming and necessity*. Cambridge: Harvard University Press.
- McGinn, C. (1996). Another look at color. *The Journal of Philosophy*, 97, 537–553. doi:[10.2307/2941048](https://doi.org/10.2307/2941048)

¹⁴ There are reasons, too, to worry that disjunctive accounts fail to locate a unifying feature. For why, see Watkins (2005).

- Shoemaker, S. (1998). Causal and metaphysical necessity. *Pacific Philosophical Quarterly*, 79, 59–77. doi:[10.1111/1468-0114.00050](https://doi.org/10.1111/1468-0114.00050).
- Shoemaker, S. (2007). *Physical realization*. Oxford: Oxford University Press.
- Smart, J. (1975). On some criticisms of a physicalist theory of colour. In Chung-yin-Chen (Ed.), *Philosophical aspects of the mind-body problem* (pp. 54–63). Honolulu: University Press of Hawaii.
- Watkins, M. (2002). *Rediscovering colors*. Dordrecht: Kluwer Academic Publishers.
- Watkins, M. (2005). Seeing red: The metaphysics of color without the physics. *Australasian Journal of Philosophy*, 83, 33–52. doi:[10.1080/00048400500043936](https://doi.org/10.1080/00048400500043936).
- Yablo, S. (1995). Singling out properties. *Philosophical Perspectives*, 9, 477–502. doi:[10.2307/2214231](https://doi.org/10.2307/2214231).