

## **A Dilemma for Jackson and Pargetter's Account of Color<sup>1</sup>**

Frank Jackson and Robert Pargetter (1987)<sup>2</sup> have argued for a version of reductive physicalism about color which they claim can accommodate the basic intuitions that have led others to embrace dispositionalism or subjectivism about color. Jackson (1996) has further developed the view and provided responses to some objections to its original statement. While Jackson and Pargetter do not have much company in endorsing their specific form of color physicalism, elements of their view have shown up in other realist accounts, including the relativized account of color offered by John Spackman (2002), the disjunctivism of color properties endorsed by Peter Ross (2000), and the subjectivist strain present in Sydney Shoemaker's (1994) discussion of color.<sup>3</sup> Additionally, Mark Johnston (1992) has used Jackson and Pargetter's view as a principal target in his arguments against color physicalism.

According to Jackson and Pargetter, color terms are non-rigid designators having subjective definitions, but colors are primary, physical properties of objects in the same way that shape and motion are. One particularly attractive feature of the view is that, if it succeeds, it can resolve much of the tension between pre-theoretical reflection and empirical research, each of which exerts a strong pull on how we think of

color. Commonsense understands colors to be out in the world, as properties of objects that cause our color experiences. When an apple looks red to me, I take the experienced red quality to have been caused by the redness of the apple. Further underscoring the commonsense view's connection between color experiences and colors, it is natural for us to think of something's *being* red as very closely tied to its *looking* red. However, the conclusion of empirical investigation into the nature of color is that the causes of color experiences are highly variable, depending on the constitution of the perceiver, the physical structure of the object perceived, and the conditions in which the object is viewed.<sup>4</sup> *Prima facie*, the highly variable nature of the causes of color experience makes it hard to see how there could be an objective, physical property of objects that can be identified with, for example, redness. For Jackson and Pargetter, color properties are objective, physical properties of objects that are causally responsible for our color experiences, but the determination of which physical property is which color is a subjective matter, depending on who is doing the viewing and in what conditions.<sup>5</sup> It is in this way that they propose to reconcile folk theory's link between looking red and being red with what color science tells us about the heterogeneous causes of color experiences.

In this note, I will argue that Jackson and Pargetter's account is confronted with a serious difficulty. Their analysis of color properties in terms of the causing of color experiences undercuts their claim that colors are nondispositional, objective properties of objects. Thus Jackson and Pargetter are left with a dilemma: either they give up what they contend is an obvious truth about color concepts – that color properties are

the properties objects look to have when they look colored - and find some other route to physicalism about color or they altogether abandon their claim that colors are objective, primary properties of objects.

## 1. The Arguments

Jackson and Pargetter's strategy is rather straightforward: they pair what they take to be a conceptual truth about the relation between colors and color experiences with an empirical, scientific claim about what causes color experiences, in order to arrive at the conclusion that colors are physical properties of objects. Their argument is:

### (1) *Jackson and Pargetter's Physicalist Argument*

1. [Conceptual Truth] Redness = What causes (in the right way) the experience of red in normal perceivers in normal circumstances.
2. [Empirical Truth] Physical properties cause the experience of red in normal perceivers in normal circumstances.
3. Therefore, Redness is a physical property.

Since Premise 1 in the above argument is put forth as a conceptual truth, its truth rules out dispositional accounts of color *a priori*. The anti-dispositionalist argument developed from Jackson and Pargetter's conceptual truth goes as follows:

### (2) *Jackson and Pargetter's Anti-Dispositionalist Argument*

1. Dispositions do not cause anything, their categorical bases do.
2. Redness does cause things (viz., experiences of red).
3. Therefore, Redness is not a disposition.

Jackson and Pargetter grant that dispositionalism is picking up on something fundamentally peculiar about the way colors are presented to us. This is also a point which Jackson (1996) has continued to stress. It is quite natural to think that there is a close tie between something looking to have a certain color and it actually having that color. Despite their opposition to dispositionalism, Jackson and Pargetter rightly claim that, if true, their account captures the “dispositional truism” which is responsible for much of the appeal of dispositionalism.

(3)  $x$  is red if and only if  $x$  looks or would look red to normal perceivers in normal circumstances (pp.69-70).

Although dispositionalism is ruled out by the argument in (2), Premise 1 of the physicalist argument in (1) entails (3). If redness is what causes the experience of red in normal perceivers in normal circumstances, then an object will be red just in case it looks or would look red to normal perceivers in normal circumstances.

After demonstrating how their non-dispositionalist account can accommodate the core idea of dispositionalism, Jackson and Pargetter set out to show how their non-subjectivist account of color can nevertheless accommodate key claims on behalf of subjectivism. They take the following three claims to be the basis of the often persuasive, yet mistaken, arguments for subjectivism about color:

(4) *Subjectivist Truths*

1. “The fundamental ground for ascribing a certain colour to something is the colour it looks to have” (p.70).

2. “The colour something looks to have may be highly variable, depending both on viewing conditions and who is doing the viewing” (pp.70-71).
3. There are cases in which the apparent color of an object differs from one set of circumstances to another, and there is no principled way “to settle on which colour, in which set of circumstances, should be the guide in ascribing a colour to the object” (p.71).

The challenge facing Jackson and Pargetter is to avoid subjectivism while granting these claims.

## **2. Redness and the Property of Being Red**

Instead of directly addressing subjectivism about color, Jackson and Pargetter begin by discussing Jonathan Bennett’s example of phenol, which tastes bitter to roughly 70% of the population and is tasteless to the remainder of the population. There seems to be no principled way of deciding which group’s testimony to accept in determining whether phenol is tasteless or bitter. How, in this case, is one to avoid subjectivism about bitterness? Jackson and Pargetter propose to “avoid subjectivism by saying that bitterness for those to whom phenol tastes bitter is a *different* property from bitterness for those to whom phenol is tasteless” (p.71). The *experience* of bitterness is not different for the two groups, but the properties presented to the groups in their experiences are different. Although they admit that this response might sound strange to some, Jackson and Pargetter cite in their own behalf “the [familiar] idea that pain for humans may be different from pain for dolphins, that what fills the pain-role may differ from

one group of organisms to another” (p.71). Extending to color their handling of the cases of pain and bitterness, Jackson and Pargetter become functionalists about color; on their account, redness is the property that plays the causing-red-experiences-role. Thus if we imagine a population of color perceivers that can be divided into two subpopulations, A and B, which are physiologically alike except that the As are constituted in such a way that the property  $\phi$  of objects causes red experiences in them whereas the Bs are constituted in such a way that the property  $\psi$  of objects causes red experiences in them (and  $\phi \neq \psi$ ), then redness is a different property for the As than it is for the Bs. Nonetheless, the property that is redness for each subpopulation ( $\phi$  for the As and  $\psi$  for the Bs) is an objective, physical property, but it is subjectively determined which objective, physical property is redness for each population.

Jackson (1996) acknowledges that one is sure to end up with a relativized account of color, if one accepts both that colors cause color experiences and that empirical research is correct in concluding that the causes of color experiences can be highly variable across physical properties, perceivers and viewing conditions.<sup>6</sup> What color science tells us makes it impossible to identify a unique type of physical property that is the cause of red experiences for all perceivers in all circumstances. This recognition led Jackson and Pargetter to revise their original claim that redness is what causes red experiences. They are instead now offering an account of redness for a particular subject (or perhaps redness for a particular class of similarly constituted color perceivers) at a particular time and in a particular circumstance. Thus they are no longer talking unqualifiedly about redness.

(5) Redness for subject S in circumstances C at time t is the property which causes (or would cause) objects to look red to S in C at t. (p.72)

Jackson and Pargetter contend that (5) affords them a satisfactory means of response to anti-objectivist objections based on the variability of apparent color which have been raised by subjectivists.

Consider now the question, “Is such-and-such an object (e.g., a ripe tomato) red?” Jackson and Pargetter have switched from talking about redness to talking about redness for S in C at t, but they realize that they must offer some way of evaluating the truth-value of color statements which do not involve reference to a perceiver (as is the case with most color-attribution statements), such as ‘The ripe tomato is red’. Their account of the truth-conditions of color-attribution sentences reflects a general position often found in discussions of color:

(6) ‘x is red’ is true if and only if x has redness for normal perceivers in normal circumstances (however ‘normal’ is cashed out). (p.77)

If we take their earlier analysis of colors as the causes of color experiences (Premise 1 of (1)) together with (6), Jackson and Pargetter end up saying:

(7) x is red =<sub>df</sub> x has the property that causes the experience of red in normal perceivers in normal circumstances.

At this point, it is fair to ask: What, then, is the property of being red? Based on (7), Jackson and Pargetter’s view is:

(8) The property of being red = the property of having the property that causes the experience of red in normal perceivers in normal circumstances.

It turns out that the property shared by red things is a second-order response property, not the primary, physical property Jackson and Pargetter started out saying red things have in common. Thus, because of their analysis of color properties in terms of color experiences, Jackson and Pargetter appear to be forced into a position in which they have to give up the brand of physicalism about color they set out to defend.

Although they do not actually explore it, Jackson and Pargetter's most promising line of response to this criticism would seem to be to mark a distinction between redness and the property of being red, and thus avoid turning colors into the second-order response properties of (8). In fact, they are committed to the claim that redness for normal perceivers in normal circumstances cannot be the same property as the property of being red. Context-independent designators of the type 'the property of being F' are always rigid, whereas context-dependent designators, such as Jackson and Pargetter's 'redness for normal perceiver's in normal circumstances', designate non-rigidly. Thus the property picked out by the former kind of designator will be the same in all possible worlds, whereas the property picked out by the latter can vary from world to world. It follows that the properties picked out by the context-independent and context-dependent designators will differ in at least some of their modal properties and, therefore, by Leibniz's Law, they cannot be identified with one another. Thus we have the following example:

- (9) 'My favorite property' is a context-dependent non-rigid designator; in other possible worlds, I might have a different favorite property, and thus the designator would pick out a different property than it does in the actual



world. However, 'the property of being my favorite property' does designate rigidly; it will pick out the same second-order property in all possible worlds that it does in the actual world. Thus the property of being my favorite property is not to be identified with my favorite property.

Other examples in which 'the F' (or 'Fness') and 'the property of being F' do not pick out the same property are 'the winner of the race' and 'the property of being the winner of the race', and 'the color of most mailboxes' and 'the property of being the color of most mailboxes'. The idea is to extend the same sort of remarks to 'redness' and 'the property of being red' so that the latter designates rigidly, but the former does not. Thus they are not one and the same property, and it is still open to type-identify colors with physical properties of objects.<sup>7</sup>

An initial concern about this maneuver is that it looks as though there is an asymmetry between (9) and the case of color. There clearly is little reason to doubt that my favorite property and the property of being my favorite property can come apart, but one is left to wonder what else redness could be except for the property of being red. Unlike the case described in (9), it seems rather difficult, if not impossible, to conceive of a scenario in which an object has the property of being red but lacks redness. Perhaps Jackson and Pargetter could respond by saying that the reason for the difficulty is that colors are not usually thought of as functional properties, and the naive, pre-reflective conception of color in some way prevents one from likening the case of color to that described in (9). They might claim that once we jettison the old, misguided way of thinking, the parallel between (9) and the case of color will become evident. Even if we grant that this worry about (9) can be satisfactorily answered, there

looms a further, and much more damaging, problem for Jackson and Pargetter's account.

### 3. Disjunctive Properties

Despite examples like (9) providing some hope of distinguishing between redness and the property of being red, so that colors do not have to be identified with second-order response properties, Jackson and Pargetter are not yet in the clear. In order to arrive at a physicalistic account of color, Jackson and Pargetter require that there is a *unique* physical property that causes the experience of red in normal perceivers in normal circumstances. This results from the use of '*the* property that causes the experience of red' in the right hand side of (7). If there is no physical property at all that causes the experience of red in normal perceivers in normal circumstances, or if more than one property does so, then physicalism is false.

It is easy to see why, if there is no physical property which causes the experience of red in normal perceivers in normal circumstances, physicalism is false. But, what if more than one physical property caused the experience of red in normal perceivers in normal circumstances? In that case, we would end up with red things having in common that they each have a physical property which causes them to look red to normal perceivers in normal circumstances. Once that is done, (7) has to be rewritten as

- (10)  $x$  is red  $=_{df}$   $x$  has a property that causes the experience of red in normal perceivers in normal circumstances.

If this is so, there is no single physical property shared by all red objects in virtue of which they cause the experience of red in normal perceivers in normal circumstances. From this it follows that colors cannot be type-identified with physical properties. In that case, the distinction between redness and the property of being red collapses, because the only reason we had for marking a distinction between the two properties in the first place was to allow us to type-identify Jackson and Pargetter's population- and circumstance-relative color properties with primary, physical properties of objects while also granting that all red objects have in common the second-order response property of being red. It is my goal in what follows to show that it is very doubtful that there is a single physical property shared by all red things in virtue of which they cause the experience of red in normal perceivers in normal circumstances, and thus that there is no reason to accept Jackson and Pargetter's physicalistic account.

As was suggested in the Subjectivist Truths cited earlier in (4), subjectivists are often quick to point out that any number of different physical properties could cause an object to look red, and thus colors would seem to resist type-identification with objective, physical properties of objects. This point also threatens Jackson and Pargetter's revised talk of redness for S in C at t. Even if we restrict ourselves to a given subject, in a given circumstance, and at a given time, it is empirically possible that there would be any number of different physical properties which would cause an object to look red to S in C at t. In order to maintain both physicalism and the explanation of color properties in terms of color experiences, Jackson and Pargetter take seriously the possibility that redness is a disjunctive property of the following sort:

- (11) Redness for S in C at t is the disjunctive property each disjunct of which does or would cause an object to look red to S in C at t. (p.75)

Thus

- (12) x is red for S in C at t =<sub>df</sub> x has the disjunctive property which does or would cause an object to look red to S in C at t.

From (12) we are led to

- (13) x is red for S in C at t =<sub>df</sub> x has a property which is a disjunct included in the disjunctive property which does or would cause an object to look red to S in C at t.

Jackson and Pargetter contend that, given their analysis of color terms, a standard objection to taking color properties to be disjunctive - that the individual disjuncts are not related to one another (at least not in the "right sort of way") - can be handled; what the disjuncts have in common is that they cause things to look red to S in C at t (p.76). However, (11)-(13), together with the account of color properties in terms of their causing color experiences, raise a question regarding whether the disjuncts are, in fact, related in the way required for legitimately taking the disjunctive property they form to be redness.

Before discussing disjunctive properties any further, it should be pointed out that Jackson and Pargetter offer a second means of response to the problem of possible multiple causes of color experiences. They say:

- (14) The second response is to rest content with an account of the redness of O for S in C at t, the redness of O for S in C at t being the property of O which

does or would cause O to look red to S in C at t. In this case, the redness of O for S in C at t must actually be a property of O; a property which may or may not actually be causing O to look red to S in C at t, for S may not actually be looking at O. (p.76)

This response is supposed to avoid the appeal to disjunctive properties, because it talks about *the* property of an object O which causes or would cause it to look red to S in C at t. The idea, I take it, is that there is a unique physical property which causes or would cause O to look red to S in C at t, and thus there is no need to identify colors with disjunctive properties. Jackson and Pargetter claim to have no preference as to which means of response to choose.

One possible objection to Jackson and Pargetter's second response is that it leads to an excessively relativized account of color. Jackson and Pargetter have already given up talking about redness *simpliciter* in favor of redness for normal perceivers in normal circumstances and redness for S in C at t. Some might complain that relativizing the account of color even further, by including reference to particular objects, amounts to abandoning anything resembling our folk theory of color, with which Jackson and Pargetter are interested in remaining consistent (at least in some form). By narrowing the target of their account in this manner, it is hard to see what contact Jackson and Pargetter's account still has with the folk theory of color, which would seem to include more general kinds of beliefs (viz., beliefs about there being *something* shared by *all* red objects in virtue of which they look red) rather than more specific beliefs about what is causally responsible for a particular object looking red. This objection is not without

merit. However, there is a deeper problem with the second response, one which makes it vulnerable to the anti-disjunctivist objections that will follow.

To see that the second response also requires an appeal to disjunctive properties, consider the following case, which is adopted from Averill (1985). Suppose that an artist uses two pots of paint, A and B, to paint a canvas. The paint in each pot looks to normal perceivers in normal circumstances to be the same shade of red. The artist first uses paint from pot A to paint a figure on the canvas. After that is done, paint from pot B is used to fill in the entire background. Once the artist is finished, an observer, S, walks by at  $t_1$  and looks at the canvas, viewing the canvas in circumstances  $C_1$  (viz., normal sunlight). The entire canvas looks a uniform shade of red to S in  $C_1$  at  $t_1$ . However, it turns out that the paints in pots A and B, although they look to be the same shade of red, are of very different physical natures. Thus there is not a single physical property that is causing the canvas to look red to S in  $C_1$  at  $t_1$ . This is possible whether one identifies colors with combinations of wavelengths of light or spectral reflectance profiles. In the former case, this is because of the well-known fact that a variety of different combinations of wavelengths can look the same color.<sup>8</sup> In the latter case, the phenomenon of metamerism is responsible; metamers are stimuli having (possibly very) different spectral reflectance distributions that produce the same experienced color.<sup>9</sup> Since there is no unique physical property which is causally responsible for the redness of the canvas for S in  $C_1$  at  $t_1$ , it looks as though Jackson and Pargetter are once again forced to appeal to disjunctive properties. If so, I see no reason for them not to drop altogether the highly relativized account of the second response and to try to make the less relativized account of the first response work.

Returning our attention to the appeal to disjunctive properties, a problem seems to have crept in regarding what property it is that all red objects have in common in virtue of which they look red to normal perceivers in normal circumstances.<sup>10</sup> Jackson and Pargetter state that all the properties constituting the disjuncts of redness have in common that they each cause or would cause their bearers to look red to normal perceivers in normal circumstances. However, saying that is not the same as saying that there is some characteristic shared by each of the disjuncts in virtue of which each disjunct causes or would cause its bearer to look red to normal perceivers in normal circumstances. More simply, there seems to be no common underlying nature to the disjuncts that accounts for them causing objects to look red. In (11), each disjunct *by itself* is a property which does or would cause an object to look red. Since no reason is given for supposing that there is a common underlying nature to its disjuncts in virtue of which they cause objects to look red, it is difficult to view Jackson and Pargetter's disjunctive property as being causally responsible for an object's looking red. Certainly the disjunctive property cannot "inherit" the causal powers of its disjuncts by the simple maneuver of insisting that inclusion of a property in the disjunction demands that that property cause the experience of red. The disjunctive property itself seems causally inefficacious, and thus it has no significant role in explaining why an object looks red.

Keeping in mind Jackson and Pargetter's analysis of redness as what causes objects to look red, if the proposed disjunctive property is not what causes objects to look red, then that property has no legitimate claim to the title 'redness'. Redness will

turn out to be a disparate property which resists type-identification with any one objective, physical property of objects; instead there will be any number of different properties which could cause an object to look red. Thus what red things have in common is that they have a property which causes things to look red, not that they have *the* property which causes things to look red. By failing to identify colors with a causally efficacious property, Jackson and Pargetter do not have on offer an acceptable physicalistic, primary quality account of color.

I am not arguing here that all disjunctive properties are causally inefficacious. What I am insisting on, however, is that wildly or excessively disjunctive properties cannot be causally efficacious. This is a claim with which even Jackson (1996) has explicitly stated agreement when considering objections to his and Pargetter's view.<sup>11</sup> Of course, Jackson thinks that the disjunction for redness is not of a problematic sort. He suggests that the disjunctivist's best reply to objections raised based on the need for unity amongst the disjuncts which are supposed to comprise color properties is

- (15) ... to urge that the disjunction is not excessively disjunctive. Even if most red things do not belong to a kind responsible for them normally looking red, there will turn out to be, all the same, sufficient similarity between what typically makes things look red for us to be able to identify red with a disjunctive property that is sufficiently unified to count as a cause. For it is hard to believe that there is not enough rhyme or reason to things looking red given the evolutionary importance of color vision, the role of color difference



in the detection of shape, the phenomenon of color constancy . . . and the phenomenon of color stability . . . to unify the disjunction.<sup>12</sup>

This passage indicates that Jackson is well aware of worries, such as those voiced in this note, about the causal efficacy of certain kinds of disjunctive properties. However, Jackson believes that the disjunctive properties with which colors are to be identified can be unified in the right sort of way. To show that Jackson and Pargetter cannot get the disjunction unified in the way they require, let us first examine the case of a causally inefficacious disjunctive psychological property and then take a look at what science has to say about the causes of color experience.

Consider J.J.C. Smart's example of snarkhood, which, despite his claims otherwise, should reinforce the view that highly disjunctive properties lacking an appropriate unifying feature are not causally efficacious. Smart asks us to entertain the fictional case of a fellow, Smith, who suffers from a rather odd neurosis. If, and only if, he sees a tomato, a rainbow, a bulldozer, or a bishop, Smith goes red in the face and stands on his head. Smart supposes that there should be some "property corresponding to tomato  $x$  or rainbow  $x$  or bulldozer  $x$  or archbishop  $x$ " which will be of interest to both Smith and his psychiatrist," a property which is "perfectly objective . . . but because of its peculiar disjunctiveness . . . it is both a disjunctive and idiosyncratic property."<sup>13</sup> Call this property 'snarkhood'. Smart claims that "[snarkhood] is the property which *causes* or which *explains* the peculiar behavior; 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."<sup>14</sup> Should we go

along with Smart in taking snarkhood to be a property with genuine causal powers? That is, is it legitimate to think that snarkhood is causing Smith's odd behavior?

I submit that we should not take snarkhood to be causally efficacious. Let us consider what looks to be a principal means of distinguishing between "Cambridge"-type disjunctive properties and disjunctive properties with genuine causal powers - that the latter have a legitimate role in scientific explanations whereas the former do not. I would venture that snarkhood has little or no explanatory power. Since the property is quite idiosyncratic and the disjuncts have little or no connection between them apart from their evoking from Smith the same type of behavior, there is no underlying nature which the disjuncts have in common. In that case, if we were good psychiatrists and wanted to know *why* snarkhood caused Smith's odd behavior, we would be at a loss. Nothing about snarkhood itself would satisfactorily explain Smith's odd behavior; there would always remain a question of why it was snarkhood, and not some other highly disjunctive and idiosyncratic property, that causes Smith to act in that way. It cannot be a brute fact that snarkhood causes Smith to go red in the face and stand on his head. To get a satisfactory explanation in this case (i.e., to eliminate any further "why?" questions), we would have to instead look at the nature of each of the disjuncts individually (i.e., bulldozerhood, bishophood, etc.) and determine what it is about them that causes Smith to act as he does when he sees them. Snarkhood, therefore, looks explanatorily impotent. Thus we should take the disjuncts of snarkhood to be the truly causally efficacious properties and 'snarkhood' becomes

nothing more than a convenient way to refer to distinct stimuli that elicit the same behavior.

When reflecting on what empirical research tells us about the nature of color, Leda Cosmides and John Tooby comment that

**(16)** . . . color is not already out there, an inherent attribute of objects. We know this because we sometimes see physically identical objects or spectral arrays as having different colors – depending on background, circumstance, context – and we routinely see physically different spectral arrays as having the same color. The machinery that causes these experiences allows us to identify something as the same object across situations despite the different wavelength composites that it reflects from circumstance to circumstance.<sup>15</sup>

The physical properties of objects that are causally responsible for our color experiences are a highly heterogeneous lot. Like the causes of Smith's bizarre behavior, different physical properties can cause qualitatively identical color experiences and there need not be any common nature to the various causes. Furthermore, the many-to-one relation points not only from physical properties to experiences, but also in the opposite direction; think of Smith seeing a bishop and hopping around on one leg instead of going red in the face and standing on his head. The same physical stimulus can cause qualitatively different experiences in similarly constituted perceivers (e.g., normal humans) or in the same perceiver at different times.<sup>16</sup> Within the human population alone, there are sex-based differences in apparent color when viewing certain stimuli.<sup>17</sup>

Observations such as these make the diverse physical causes of color experiences poor candidates for unification.

As was noted at the outset of the paper, color vision depends on three critical elements, the physical nature of the object perceived, the constitution of the perceiver's perceptual mechanisms, and the conditions under which the object is viewed. If we interrogated Jackson and Pargetter's disjunctive redness in the same way we did Smart's snarkhood, asking why *this* property elicits the response it does, we would be at a loss in trying to make sense of how redness causes red experiences. Giving an explanation of how redness causes red experiences – or developing meaningful predictions of whether an object will look red - cannot be done by pointing to a property that exists only as an assemblage of various red-experience-causing properties, especially when there are circumstances in which some of those properties will not cause red experiences. We would have to take the next step of looking at each of the disjuncts of redness – and the nature of the perceiver and the conditions of viewing - to understand how any red experience is caused. In that case, disjunctive redness is not a causally efficacious property.

While Jackson and Pargetter deny that color is a psychological property (i.e., colors exist only in the minds of perceivers), the subjective element that they wish to accommodate within their account of color leaves us with no straightforward explanation of how disjunctive, physical color properties could be unified. Jackson (1996) assumes in the passage quoted in (15) that evolution and the important role of color vision in our everyday lives will point us to something “physically interesting”

that unifies the disjunctive color properties. That is a thin reed to grasp at. All that it is safe to say about the evolutionary function of color vision is that it developed to allow us to detect and discriminate object surfaces, motion and so forth by means of their reflection of light. Color vision makes creatures better-equipped for tasks such as breaking down the camouflage of prey and identifying conspecifics.<sup>18</sup> Surface reflectance carries information about the perceived object that is of consequence to survival, reproduction and overall well-being, but from that one should not conclude that color experience is picking up on a unified property of objects, especially in the light of the fact that a one-to-many relation can point in either direction between physical causes and color experiences. The further recognition and discrimination of some distinct property of objects – the kind that would yield a type-reduction of the distal causes of color experiences to physical properties of objects – is not included in the function of color vision.

That color vision tracks physical properties of objects, allowing for detection, discrimination and re-identification of things in our environment, does not guarantee that the format in which those properties are represented in our experience is faithful to the actual nature of the properties tracked. Color vision is simply a means of acquiring information about various kinds of states of objects in our environment, helping us determine whether, *inter alia*, fruit is ripe for eating, a potential mate is ready for intercourse, and a nearby creature is a legitimate threat to one's safety. Even if that information is not represented in a format entirely true to the objective nature of what is tracked and a type-type matching between the physical properties tracked and their

representation in experience is not possible, what is central to the utility of color experience is that that information is represented at all in our experience. The “illusory format” of representation and the potential for a one-to-many relation between kinds of experiences and kinds of physical states are irrelevant, so long as the information color experience makes available to cognition leads to reasoning and behavior that further the ends of the organism.

#### **4. Spectral Reflectances**

Jackson and Pargetter’s reliance on a unifying feature to bestow causal efficacy upon disjunctive color properties underscores one of the most troubling issues surrounding highly disjunctive properties, one that was alluded to earlier. The disjuncts cannot be unified in the right sort of way for counting the highly disjunctive property they form as causally efficacious without there being some property shared by all the disjuncts which *accounts for* the causal powers of the disjunction they form; certainly, not just any shared feature will do. However, if one can come up with such a unifying property, why go to the trouble of opting for disjunctivism in the first place? It would seem far simpler, and more accurate, to identify colors with the relevant unifying property, since it would either have or otherwise sufficiently explain the “original” causal powers from which the causal powers of the disjuncts, and the highly disjunctive property they form, are derived. Thus having already failed in isolating a unique property responsible for causing color experiences, the prospects of Jackson and Pargetter coming up with a satisfactory unifying property do not look very good, either.

Take the case of spectral reflectance profiles, which Jackson (1996) submits as a plausible candidate for the unifying feature shared by the disjuncts of color properties.<sup>19</sup> Although the details are more complex, it will do for our purposes to say that the spectral reflectance profile of an object is given by specifying the percentage of incident light reflected by that object at each wavelength or over particular bandwidths. David Hilbert has argued that colors are to be identified with types of spectral reflectance profiles.<sup>20</sup> However, spectral reflectances are dispositional properties of objects; dispositions to reflect a certain percentage of incident light at each wavelength or over particular bandwidths. Jackson exploits the dispositional nature of spectral reflectances in his argument against Hilbert, which is the same as his and Pargetter's anti-dispositionalist argument cited earlier in (2): Since dispositions cannot be causes, and spectral reflectances are dispositions, and colors cause color experiences, it follows that colors should not be identified with spectral reflectances.<sup>21</sup> Jackson instead wants to use spectral reflectance profiles as the unifying feature possessed by each of the disjuncts that form the disjunctive properties with which he identifies colors.

Since spectral reflectances are dispositions, Jackson is certainly right to claim that colors should not be identified with them. However, their being dispositional properties would also seem to rule them out as being what unifies the highly disjunctive color properties with which Jackson is concerned. We are looking for something which lends support to Jackson's claim that the highly disjunctive property of redness is unified in the right sort of way to be considered causally efficacious. The property offered by Jackson that is supposed to be shared by all the disjuncts of redness, though, is itself causally inert, because it is a disposition. It is the categorical

bases of dispositions, and not dispositions themselves, that have causal powers. Furthermore, the categorical basis of a disposition can vary from object to object, and the only thing those categorical bases need have in common is their effects; there does not have to be a shared nature to the categorical bases themselves. Due to their multiple realizability and the earlier mentioned phenomenon of metamerism, spectral reflectances are themselves not a unified bunch. There are multiple multiply realizable spectral reflectance profiles that could be associated with any given color, none of which need have anything in common with each other besides the effect their categorical bases produce in perceivers. Thus it is rather dubious to appeal to them to unify anything.

To reiterate the point made at the beginning of this section, it is not enough to unify the disjuncts of redness (in the right sort of way) that they each share *some* common feature. The feature shared must be of a sort which bestows certain causal powers upon the disjuncts and thereby the disjunction they form or it should at least lead us to suppose that there is something sufficiently similar about the causal powers of each disjunct. If the disjuncts have nothing in common in virtue of which they each cause things to look red and what they do have in common (spectral reflectance profiles) is completely lacking in causal efficacy and is itself not unified, then it is unreasonable to suppose that the disjunctive property they form is unified in such a way to be causally efficacious. Dispositions, because they are second-order properties that arise *from* their causally efficacious categorical bases, cannot explain the causal powers of *anything*; nothing has its causal powers because it has a particular



disposition. How, then, could a disposition unify a highly disjunctive property in the way required for taking that property to be causally efficacious? Spectral reflectances simply cannot lend (or underwrite) causal powers to the disjunctive properties Jackson wants them to unify.

## **5. Conclusion**

It should now be clear that Jackson and Pargetter's view is saddled with crippling problems due to their attempt to give a physicalistic, primary quality account of color properties in terms of the causing of color experiences. The spectral reflectance profiles Jackson (1996) cites are themselves unacceptable candidates for identification with colors and they are disqualified as a possible unifier of the disjunctive properties Jackson and Pargetter resort to. Thus Jackson and Pargetter have to either give up the attempt to offer a physicalistic account of color which takes color terms to be non-rigid designators having subjective definitions or hope that empirical research eventually provides a suitable candidate for the required unifying feature. This puts their primary quality view of color on very shaky ground, at best.

## 6. Notes

<sup>1</sup>I would like to thank an anonymous referee from this journal for helpful comments and Michael Tye and Kent Johnson for lively discussion of this topic. A debt of thanks is also owed to Jonathan Cohen and Leopold Stubenberg, both of whom provided insightful comments on conference presentations of an ancestor of this paper.

<sup>2</sup>References to Jackson and Pargetter (1987) will appear in the text and will be given by page number.

<sup>3</sup>While none of these authors explicitly aligns himself with Jackson and Pargetter (in fact, only Spackman cites them), they all share Jackson and Pargetter's goal of remaining faithful to the pre-theoretical intuition that the way objects look to be colored is strongly tied to them actually being a certain color, while also respecting the results of empirical investigation into the nature of color. From this common starting point, Ross, Shoemaker and Spackman are each led to an account of color that intersects with Jackson and Pargetter's at important points.

<sup>4</sup>Hurvich (1982), p.67 and Gregory (1997), p.134.

<sup>5</sup>Jackson and Pargetter (1987), p.79 and Jackson (1996), p.206.

<sup>6</sup>Jackson (1996), p.204.

<sup>7</sup>Jackson and Pargetter (1987) (and Jackson (1996)) clearly think that color terms (e.g., 'red') are non-rigid designators and they are on record as accepting the claim that 'the property of being F' designates rigidly; see Jackson (1980), p.29-31 and Jackson, Pargetter, and Prior (1982), pp.213-14. In the same places, they also endorse the sort of

reasoning employed here to refute identities of the sort 'F = being F' when 'F' is a non-rigid designator. See also Tye (1981a and b).

<sup>8</sup>Gregory (1997), p.124.

<sup>9</sup>Byrne and Hilbert (1997c), p.265.

<sup>10</sup>In what follows, I use 'looks red to normal perceivers in normal circumstances' (or just 'looks red') instead of Jackson and Pargetter's 'looks red to S in C at t' for reasons of simplicity only. Similar remarks to those which follow would apply even if one employed the latter.

<sup>11</sup>Jackson (1996), pp.214-17.

<sup>12</sup>Jackson (1996), p.214.

<sup>13</sup>Smart (1975), p.3.

<sup>14</sup>Smart (1975), p.5.

<sup>15</sup>Cosmides and Tooby (1995), p.xi.

<sup>16</sup>Kuehni (2001), pp.63-5.

<sup>17</sup>Neitz and Jacobs (1986), p.625.

<sup>18</sup>Regan (2000), pp.207-10.

<sup>19</sup>Jackson (1996), p.215.

<sup>20</sup>Hilbert (1992) and Byrne and Hilbert (1997c).

<sup>21</sup>Jackson (1996), pp.202-4, 215, and 219n6.

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