

## Color Eliminativism\*

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We can hold that the colors are qualities, and objective qualities at that, even they never do in fact pervade surface or volumes but are only appear to do so  
– Mark Johnston

### 1. Introduction

Philosophical theories of color divide over two issues. First, there is the issue of Reductionism versus Primitivism. *Reductionism* holds that colors are identical with physical properties, dispositional properties, or other properties specifiable in non-chromatic terms. *Primitivism* holds that Reductionism is false. If there are color properties at all, they are *sui generis*. Second, there is the issue of Realism versus Eliminativism. *Realism* maintains that external objects possess color properties. *Eliminativism* maintains that it is not the case that external objects possess color properties.

As between Reductionism and Primitivism, I favor Primitivism. In my view, the various forms of Reductionism fail, leaving us with no choice but to embrace Primitivism. Here I will simply be taking Primitivism for granted.<sup>1</sup> Once we accept Primitivism, we still face the choice between Realism and Eliminativism. Recently, many have opted for *Realist Primitivism*: they accept the irreducibility of color but accommodate Realism by maintaining that objects have primitive color properties over and above their physical properties, somewhat as G. E. Moore claimed that some states of affairs have a primitive property of goodness over and above their natural properties. This view is thought

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\* This paper (from 2006) is now defunct. The argument is discussed in Cohen *The Red and the Real*, pp. 65-74; and in my NPDR review of that book. My paper "The Manifest Image as Illusion" will incorporate material from this paper, as well as "Can Disjunctivists Explain Our Access to the Sensible World?"

<sup>1</sup> One argument for Primitivism is founded upon "Revelation" (Campbell 1992); another is founded upon the apparent contingency of the connection between colors and properties outside the family of color properties (Chalmers 2006, 81). As noted, I think that the best argument for Primitivism is rather an argument from failure: the available forms of Reductionism fail. For arguments against Reductive Physicalism (Byrne and Hilbert 2003, Tye 2000) deriving from color structure, see Boghossian and Velleman (1991) and Hardin (1988, 66). For arguments against Reductive Dispositionalism (McGinn 1983) deriving from circularity and other problems, see Boghossian and Velleman (1989) and McGinn (1996).

to avoid the problems with Reductionism (Boghossian and Velleman 1989, 1991; Hardin 1988) while at the same time accommodating our commonsense conception of the world as populated with colors.<sup>2</sup>

Realist Primitivism comes in two importantly different versions. *Response-Independent Realist Primitivism* holds that what primitive colors objects instantiate is a mind-independent affair.<sup>3</sup> John Campbell (1993) defends this type of view. It is the non-reductive analogue of Reductive Physicalism about color. By contrast, *Response-Dependent Realist Primitivism* holds that what primitive colors objects instantiate is constitutively linked to what color experiences those objects produce in us. Necessarily, an object instantiates a certain primitive color just in case it has the disposition to produce experiences as of that primitive color under normal conditions. Colin McGinn (1996) defends this type of view. It is the non-reductive analogue of Reductive Dispositionalism.

Once we accept Primitivism, we might also opt for Eliminativism. This paper is a defense of this option – a kind of Eliminativist manifesto. Eliminativism has a long and distinguished history, having been defended by Galileo, Newton and Locke. Yet today many dismiss Eliminativism because it conflicts too violently with our commonsense conception of the world (Tye 2000, chap. 7; Byrne and Hilbert 2003, 59).<sup>4</sup> In fact, in this era of post-Moorean modesty, philosophers generally give short shrift to theories that overthrow large parts of our commonsense conception of the world. But I will argue that, once we accept Primitivism, we are no longer entitled to this common attitude in the case of color. The reason is simple: once we accept Primitivism, the

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<sup>2</sup> Realist Primitivism is clearly defended by Campbell (1993), Cornman (1975), Hacker (1987), McGinn (1996), Watkins (2005), and Westphal (2005). Yablo (1995), Stroud (2000), and Johnston (unpublished MS) also appear to accept Realist Primitivism, but they are more difficult to classify. When I say that Primitivism has it that colors are not physical properties, I have in mind a rather narrow sense of ‘physical’, where its meaning is tied to definability in terms of some privileged list of predicates. As noted, many Primitivists claim that colors supervene on physical properties. Therefore, on a more liberal definition of ‘physical’, primitive colors might count as physical.

<sup>3</sup> In this paper, I will often use the expression ‘primitive colors’. By this term, I do not mean a special class of colors, distinct from ordinary colors. In my view, color terms are unambiguous and there is only one set of properties which deserve the name ‘colors’: the properties presented in color experience. Instead, when I use ‘primitive colors’, I am in the context assuming Primitivism, the view that these properties – the referents of color terms in English - are primitive; and I am using ‘primitive colors’ to highlight this assumption.

<sup>4</sup> Nevertheless, some form of Eliminativism is defended by Averill (2005), Boghossian and Velleman (1989, 1991), Chalmers (2006), Hardin (1988), Jackson (1977), Mackie (1976), and Maund (1995).

available forms of Realism violate common sense no less than Eliminativism. Therefore, once we accept Primitivism, such “Moorean” considerations cannot be availed upon to justify acceptance of Realism over Eliminativism. Nor are there any other good arguments for preferring Realist Primitivism over Eliminativism. But, I will argue, there is an obvious reason for preferring Eliminativism to Realist Primitivism. It is common practice to invoke this benefit in deciding matters of ontology. For instance, philosophers have invoked simplicity considerations to argue for Eliminativism about composite objects, abstract objects, and so on. I will argue for Eliminativism over Realist Primitivism on the basis of its greater simplicity. Realist Primitivism requires a kind of dualism at the surfaces of objects. Eliminativism avoids such a dualism. In other words, I will revisit John Mackie’s “economy of postulation” argument for Eliminativism.<sup>5</sup>

The defense of Eliminativism to be given here has two unique features. First, a natural response to Mackie’s simplicity argument is that there are countervailing arguments to accept Realist Primitivism over Eliminativism: for instance, that Realism is part of common sense, that we can just *see* that objects are colored, and so on. This is a type of response that Mackie did not consider. In effect, my chief aim here is to argue that this response fails. Once we accept Primitivism, warrant for accepting Realism is unobtainable. Therefore, in deciding between these theories, it is reasonable to appeal to considerations of simplicity. Second, the version of Eliminativism I defend is atypical. I will argue that, although there are no colored objects, there are *color properties*. Further, I will argue that nothing at all instantiates these properties. Not only are they not instantiated by external objects. They are also not instantiated by sense data, regions of the visual field, our own experiences, or our own brains. Colors, I will argue, only live in the intentional contents of our color experiences.

My plan is as follows. First (§§2-11) I will remove three arguments for accepting Realist Primitivism over Eliminativism: the *Moorean Argument*, the *Perceptual Argument*, and the *Psychosemantic Argument*. Then (§12) I will develop a Mackie-style argument for accepting Eliminativism over Realist Primitivism.

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<sup>5</sup> Mackie (1976, 168-9) took for granted Primitivism about colors (or, as he put it, “colors as we see them”) and argued (17-19) on the basis of simplicity considerations for Eliminativism over Realist Primitivism.

## 2. Response-Independent Primitivism

Of the three arguments just mentioned, I will devote by far most attention to the “Moorean Argument”. I shall begin (§§2-6) by investigating the Moorean Argument for Campbell’s Response-Independent Realist Primitivism. I will raise a problem for the argument concerning evolution and error. Then (§§7-9) I will consider whether the Moorean Argument fares any better as an argument for McGinn’s Response-Dependent Realist Primitivism. I will argue that it is a case of out of the frying pan, into the fire: the Moorean Argument for Response-Dependent Primitivism avoids the problem about evolution and error but faces other problems concerning variation in color vision.

To begin with, some preliminaries. Recall that Response-Independent Primitivism holds that what primitive colors objects instantiate is independent of their sensory effects on us. Campbell combines Response-Independent Primitivism with *Supervenience*: any two worlds alike in pattern of instantiation of physical (for instance, light-reflecting) properties of objects are alike in the pattern of instantiation of the primitive colors (1993, 258). Relying on what might be called “proportionality considerations”, Campbell (1993, 263-264; see also Yablo 1995) argues that his view avoids Epiphenomenalism: the color *C* and not any of the underlying physical properties counts as the cause of our color experience of *C*. I disagree with this, but I will assume that Response-Independent Primitivism avoids Epiphenomenalism for the sake of argument.

In evaluating both Response-Independent Primitivism and Response-Dependent Primitivism, I will make three additional assumptions concerning color experience and color thought. My first assumption is that a certain type of view of the phenomenal character color experience is correct. This type of view is best introduced by contrasting it with a rival picture. On the rival picture, there are possible cases of “altered spectrum” in which two individuals, Bargle and Argle, have phenomenally different color experiences of some object *f*, even though *f* does not look different in *color* to them – in other words, even though they do not experience *f* as having different *colors*. On one version of this view, they have different color experiences of *f* because they have experiences with different “color-qualia”. On another version, they have different experiences of *f* because, although their expe-

periences represent it as having the same color, they represent it as having different “appearance properties” (Shoemaker 1994). As against this, I will assume that, necessarily, if two individuals have phenomenally different color experiences of some object  $f$ , then  $f$  looks different in *color* to them – in other words,  $f$  presents different (primitive) colors to them. Theories which are in agreement with this assumption include standard versions of Intentionalism (e. g. Tye 2000), Disjunctivism (Campbell 2002), Property-Complex Theory (Johnston 2004, McGinn 1999) and the Multiple Relation Theory (Alston 1999). This assumption fits with the intuitive description of altered spectrum cases as cases in which the same objects present different *colors* to two individuals; it is granted by the Realist Primitivists I will be examining here (Campbell 1993, 268 and 2002; McGinn 1999); and Realist Primitivists are arguably committed to it. They are arguably committed to it because they argue for Primitivism on the basis of the character of color experience, and such arguments are persuasive only if there is a tight connection between the character of color and the character of our experience (Byrne and Hilbert 1997, xxiv).

My second assumption concerns color talk and thought. On Primitivism, the color red is a primitive monadic property presented in color experience. In the formal mode: the predicate nominal ‘red’ denotes a primitive monadic property which is presented to us in color experience. If this is correct, then it is very natural to hold that, when we claim that something is red, we are attributing the very same property to the object. More generally, it is natural for the Realist Primitivist to accept a *Simple Semantics*: roughly, a color attribution ‘ $a$  is  $C$ ’ is true iff  $a$  instantiates primitive  $C$ .<sup>6</sup> The literal truth of our color statements and

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<sup>6</sup> This is much too simple. Like almost all predicates, color predicates are vague, and vague expressions are typically context-dependent, as the vagueness is differently resolved in different contexts depending on our interests. There are other sources of context-dependence in color predications. Consider an example due to Travis (1994): a leaf, turned brown, is painted green for decoration. The painted surface of the leaf is green, but not what is under the painted surface. Is it green? It depends on whether we are sorting leaves for decoration or to identify their species. Likewise, consider a book with a green dust jacket, but a black cover and white pages. Is it green? To handle such cases, the Color Primitivist might have to say that the predicate ‘ $x$  is green’ is context-dependent in yet another way: its standing meaning is something like  $x$  *has some contextually-salient part that instantiates primitive green*. (This adapts the proposal of Zoltán Gendler Szabó (2001).) But these complications will not matter in what follows. The important point is that, according to the Color Primitivists I will be examining here, the truth of a color predication requires that an object, or an appropriate part of an object, actually instantiates a primitive color.

beliefs requires that external objects actually instantiate the primitive colors presented to us in color experience. So, for example, if  $f$  presents primitive red to Bargle and primitive brown to Argle, and Bargle and Argle take their experiences at face value, Bargle attributes primitive red to  $f$  and Argle attributes primitive brown to it. It is not the case that they merely believe that  $f$  is disposed to produce experiences of these primitive colors (Jackson 1977a, 128); or that they believe that  $f$  has the reflectance which is the basis of these dispositions (Chalmers 2006, 92); rather they believe that  $f$  has the very primitive colors presented to them in color experience. On this view, primitive colors play a dual role. They enter into the contents of our experiences and thereby configure their phenomenal characters. In addition, they serve as the semantic values of color predicates and, if our color predications are true, are instantiated by external objects. (For defenses of this claim, see McGinn 1996; Stroud 2000, 145ff and Johnston 2006, 264.) This assumption is utterly natural and Realist Primitivists are arguably committed to it. They are arguably committed to it because if the assumption were false Realist Primitivism would be entirely unmotivated. For, in that case, one could be a Conciliatory Eliminativist (§11): one could hold that our color experiences are veridical and our color beliefs are true, without having to hold that external objects actually instantiate the primitive colors presented to us in color experience.

My third and final assumption concerns variation in color vision. For instance, there are vast differences between humans and pigeons in neural machinery and color-related behavior. I will assume that, when a human and a pigeon look at the same objects, they have different color experiences of those objects. That is to say, given my first assumption, the objects look different to them in color (Thompson et al. 1992). In general, I will assume that different species, with different types of color vision, experience the same objects as having different colors. In fact, my assumption about variation in color vision is somewhat stronger than this. The visual systems of a human and a pigeon are sensitive to different reflectance properties. For instance, the pigeon visual system is sensitive to UV light. But I assume that there can be differences in color phenomenology even when the reflectance properties tracked are held constant. For instance, consider the following case. Bargle and Argle belong to different species. If Bargle and Argle view a fruit  $f$ , the same reflectance property  $R$  causes the same ratio of stimulation in their

wavelength-sensitive cones. (Perhaps  $R$  is a reflectance-type in the sense of Byrne and Hilbert 2003.) The fruit  $f$  is an important source to Bargle's species but not to Argle's: members of Argle's species have a diet which does not include  $f$ . Therefore  $R$  normally causes quite different color processing in Bargle and Argle beyond the cones. In consequence, Bargle is easily able to pick out  $f$  from the background foliage, while Argle has difficulty in this task. As for  $f$ , so for other objects: the same reflectance properties  $R_1, R_2, R_3, \dots$  of objects normally cause in Bargle and Argle different neural states. They normally produce in Bargle  $P_1, P_2, P_3, \dots$  (respectively), and they normally produce in Argle  $Q_1, Q_2, Q_3, \dots$ . We might suppose that these neural states differ in whatever neural respect underlies the distinction the experience of "pure" colors like red and the experience of "mixed" colors like purple (Hardin 1988, De Valois and De Valois 1993). Further, we might suppose that  $P_1, P_2, P_3, \dots$  stand in different relations of similarity and difference to one another than  $Q_1, Q_2, Q_3, \dots$  stand to one another. In other words, Bargle and Argle have different internal similarity metrics for the same range of external stimuli. For these reasons, they differ markedly in their sorting, discrimination, recognition and other color-related behavior with respect to the same objects. I assume that, in a suitably elaborated version of this case, the same objects present different apparent colors to Bargle and Argle in color, just as they do to a human and a pigeon.

This assumption is reasonable even if Response-Independent Primitivism is correct, and the actual colors of objects are independent of their sensory effects on perceivers. Suppose that primitive brown supervenes on  $R$ , the relevant reflectance property of  $f$ . Suppose further that, as they view the fruit  $f$ , primitive brownness and not  $R$  counts as the cause of Bargle and Argle's visual states. Likewise for other objects: the same primitive colors count as the normal causes of their visual states. Still, in view of their vastly different neural machinery and color-related behavior, it is plausible that the same objects present different apparent colors to Bargle and Argle: on viewing these objects, they have experiences "as of" different colors. It follows from this that simple, pure input-based theories of color content are mistaken. For instance, the *Simple Causal Theory* holds, roughly, that an individual has an experience as of  $F$  iff the individual is in a visual state that is normally caused by  $F$ , in a mere statistical sense of *normally*. This theory is mistaken because it falsely predicts that, as they view  $f$ , Bargle and Argle have experiences

as of the same color. The case against this theory is overdetermined; its inadequacy is also shown by standard variation in color vision (§9), normal misperception, the distance problem, and so on.<sup>7</sup>

Some clarifications are in order regarding the assumption about variation in color vision. First, I do not derive it from any simple “linking hypothesis” connecting neural activity with how things look in color. The assumption is plausible independently of any general principle. Further, it may be that overall functional organization, rather than neural activity, determines color phenomenology. Second, this assumption is not tantamount to the controversial thesis of Internalism. Internalism is a neural sameness thesis: total neural *sameness* yields phenomenal *sameness*. By contrast, the present assumption is only that suitable *differences* in color processing and color-related behavior are accompanied by differences in color phenomenology. This is quite compatible with Externalism. Externalists can and should accept this claim (Byrne and Tye 2006, 249).

### 3. The Moorean Argument for Response-Independent Primitivism

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<sup>7</sup> Campbell appears to have once endorsed the Simple Causal Theory (1993, 189). More recently, Campbell (2002) has put forward a different theory. Campbell asserts that the character of an experience is determined by the actual layout of objects, together with the subject’s standpoint. Thus, “two ordinary observers standing in roughly the same place, looking at the same scene, are bound to have experiences with the same phenomenal character” (2002, 116). As he elsewhere puts it (forthcoming), experience is a three-place relation between a perceived object, a subject, and a standpoint. Since presumably a different story must be told for hallucination, this is a Disjunctivist view. It might be thought that this theory is incompatible with my assumption that factors besides the stimulus play a role in determining how things look in color. But if it is incompatible with this assumption, then the proper moral is to apply *modus tollens*. In that case, the theory is shown to be false by the human and the pigeon, Bargle and Argle, two individuals with individual differences in color vision viewing the same color chip (Kuehni 2004), and so on. In all these cases, two normal individuals view the same object from the same standpoint, but the object looks different to them in color. Perhaps Campbell (forthcoming) would handle these cases by claiming that “standpoint” involves more than just position; it also includes details about one’s present wiring, state of adaptation, neural processing, and so on. But then the theory becomes very complicated and does not accommodate the intuition that phenomenal differences are constituted by ostensible differences “out there”. It seems to me that there is a better theory. On the Theory of Appearing (Alston 1999), having a non-hallucinatory experience consists in an object, an apparent property of the external object, and a person standing in the three-place *relation x appears y to z*. In effect, this view replaces Campbell’s *standpoints* with *apparent properties*. On this view, in the cases described, the difference in experience consists in the fact that, owing to the internal differences, the *ostensible color property* is different, although the object and standpoint are the same. This is quite intuitive. In any case, any plausible theory must, in my view, make room for the fact that factors besides stimulus play a role in determining how things look.

Why should we accept Response-Independent Primitivism? Once we grant that colors are irreducible, why not accept Eliminativism? And if we grant that we have some reason to accept Realism, why not accept Response-Dependent Primitivism instead? The question of justification is especially pressing for Campbell's version of Response-Independent Primitivism. Campbell combines Primitivism with Supervenience. On this view, there are strictly necessary connections at the surfaces of objects between physical properties and wholly distinct primitive color properties. Some may find such necessary connections unintelligible. While I believe that the view is intelligible, it is evidently ontologically inflationary. We are entitled to view it with suspicion until a strong case has been presented in its favor.

Campbell appears to endorse what I will call the *Moorean Argument*. He suggests that Response-Independent Primitivism (he calls it 'the Simple View') is the commonsense view (1993, 258). Thus, he apparently thinks that the components of this view - Primitivism, Realism and Response-Independence - are part of common sense. (Or perhaps he thinks that *Revelation* is part of common sense, that is, the claim that we can know the essences of colors on the basis of color experience; and he believes that *Revelation* requires Primitivism.) Perhaps he also thinks that it is part of common sense that colors cause our color experiences, which requires Supervenience. In any case, he appears to hold that Response-Independent Primitivism is the view of common sense, and that this endows it with some kind of default status. This would explain why his argument for the view consists in arguing that various reasons for abandoning it are unpersuasive. (For this interpretation, see also Byrne and Hilbert forthcoming, 25.) One might view this argument as relying on a common conservativist approach to philosophy. We come to philosophy with a stock of commonsense or "Moorean" beliefs. In this era of post-Moorean modesty, many doubt the power of philosophy to supply arguments that genuinely undermine such beliefs. At the very least, many have the attitude that we are entitled to accept such beliefs unless extremely strong arguments may be given for abandoning them. Without worrying too much about Moore interpretation, I call this the *Moorean Argument*, because it obviously bears some similarity to Moore's argument for belief in the external world. This type of argument is widespread in philosophy. For instance, many would say that if our commonsense beliefs about physical objects re-

quire a dualism about things and their material constitutors, we are justified in accepting such a dualism. Ontological inflationism is justified if it is required by our most deep-seated pretheoretical beliefs.

#### **4. The Evolution of Color Vision**

I will argue that the Moorean Argument for Response-Independent Primitivism fails for a simple reason. On inspection, this view violates our commonsense conception of color just as much as Eliminativism.

Hardin (1988, 60-1) persuasively argues that Cornman's (1975) brand of Response-Independent Primitivism does not accommodate the commonsense view of color. Cornman is a Realist Primitivist who does not uphold Supervenience. Hardin argues that Cornman's view implies that the colors of objects do not make a difference to our color experiences. But then, barring a pre-established harmony, it is not likely that our color experiences are generally veridical. Even when our color beliefs are true, Hardin points out, they would be true by "blind luck"; and this is hard to square with the commonsense view that our color beliefs amount to knowledge.

By contrast to Cornman, Campbell upholds Supervenience. For the sake of argument, I have granted that on his view the response-independent primitive colors of things count as causes of our color experiences. So, I have in effect granted that Hardin's argument fails when it is applied to Campbell's version of this view.

But I will argue for the same conclusion from a different premise. I will argue that, while Campbell's view may imply that the response-independent primitive colors of objects make a difference to our *color experiences*, it cannot allow that they make a difference to *the evolution of color vision*. In the present section, I will clarify and defend this claim. In the following section, I will use it to argue that Campbell's Response-Independent Primitivism has the same deeply anti-commonsensical consequences as Cornman's version. As we shall see, the problem is avoided by McGinn's Response-Dependent Primitivism.

Before I clarify and defend my claim about evolution, we must have before us some background on the forms of color vision and their evolution. *Dichromats* possess two wavelength-sensitive receptor-types; *trichromats* possess three receptor-types; and *tetrachromats* possess four. Call these the *basic* classes. It is believed that dichromats have one opponent channel, trichromats have two, and tetrachromats have at least

three (Thompson et al. 1992). Birds, fishes, amphibians and reptiles are generally tetrachromats (Neumeyer 1991). By contrast, mammals are comparatively impoverished in color vision, typically possessing different forms of dichromatic color vision (Jacobs 1981). Humans and some other primates are unique among mammals in having trichromatic color vision. There is also variation within each basic class. Incredibly, among squirrel monkeys, there are three different forms of dichromacy and three different forms of trichromacy (Jacobs 1986). It is plausible that the same objects present different colors to the members of these different classes of perceivers, just as it is plausible that the same objects present different colors to Bargle and Argle.

What explains the evolution of color vision? To some extent, there may be no adaptationist explanation. Only a fanatical adaptationist would claim that every feature of the color vision of every species is an adaptation to some feature of the environment. But to some extent variation may be explained. In general, what explains why traits evolve in the first instance is that they enhance adaptive fitness. (I ignore genetic drift, pleiotropy, and the like.) Color vision in particular was presumably selected in order to enable percipients to detect, identify and segregate objects which are important to them given their particular habits, dietary needs, predators, and environments (Mollon 1989). There is variation in color vision because different species had different habits, dietary needs, predators, and environments. For instance, according to one hypothesis, most of the mammals of today are dichromats because their ancestors were typically small, nocturnal creatures with limited need for color vision (Goldsmith 1990, 306). By contrast, the birds of today possess various forms of tetrachromacy because the lineages leading to birds never went through a nocturnal stage, so that their color vision was allowed to develop more fully.

As noted, *homo sapiens* and some other species are unique among mammals in possessing trichromatic color vision. There were probably a few factors involved in the evolution of trichromacy in humans and some other mammals. These factors involve the habits, dietary needs, and environments of our ancestors. (i) Our mammalian ancestors acquired day-time habits, so that improved color vision became important (Bowmaker 1980). (ii) Trichromats are better than dichromats at discriminating ripe fruit and young leaves (Smith et al. 2003). So, it is plausible to suppose that trichromatic color vision evolved to help

with the detection of ripe fruit and young leaves (Sumner and Mollon 2003). It may be that this was especially important to our mammalian ancestors because Climatic cooling at the end of the Eocene made young leaves an important food source (Dominy et al. 2003). (iii) Among mammals our primate ancestors were unique in having midgut ganglion cells. For reasons I will not go into here, this made the evolution of trichromacy more likely in our primate ancestors than in other mammals (Vorobyev 2004, 235).

My argument that Response-Independent Primitivism violates the commonsense view will be founded upon the following thesis:

*Independence:* If objects have primitive colors, what color vision system evolves in a given lineage is completely independent of what primitive colors objects possessed prior to the evolution of color vision.

Here is a more precise formulation. On Response-Independent Primitivism, certain physical properties necessitate certain primitive colors. We might call these the *chromatic laws*, although they are supposed to hold with metaphysical necessity rather than with nomological necessity. Independence says that what color system evolves in any given lineage is independent of the chromatic laws.

Independence follows from two claims. (i) The color vision system a population possesses is determined by a series of minute mutations. The unique set of selection pressures that operated on the population – the kind of factors outlined above - helped to determine which mutations were selected against and which mutations remained in the population. (ii) What response-independent primitive colors objects had prior to the evolution of color vision neither determined which mutations occurred nor which mutations were selected against and what remained.

Now (i) is common ground. The case for (ii) is simple. Evidently, what primitive colors objects had prior to the evolution of color vision did not influence what mutations occurred. Nor did they determine which foods were important to individuals and which were not; nor which animals are important predators and which are not; and so on. In short, they did not influence the types of factors listed above. If prior to the evolution of color vision objects had response-independent

primitive colors, they were not *biologically significant* properties. Evolution did not care about them. Hence they also did not determine which mutations were selected against and which ones remained. How could they? What might the mechanism be?<sup>8</sup>

To illustrate, consider an individual, Bargle, belonging to some population. Bargle could be a human, a squirrel monkey, or a hypothetical creature: it does not matter. First, consider an unhappy case in which Bargle's color vision system is unreliable. Millions of years ago there was a certain species of frog. Prior to the evolution of Bargle's population, its physical properties necessitated a dull primitive color, for instance grey. In fact, this was the only primitive color of the frog. But it turned out to be very important to the members of Bargle's population that they were able to recognize the frog, for the skin of the frog was highly poisonous. Therefore, his population evolved a color system that makes the frog look bright red. Other species evolved color systems that make the frog look other striking colors. The result is regular misperception. This illustrates Independence: the fact that the frog was primitive grey did not have any causal influence on the evolutionary processes. Now consider a happier case. There is a certain nutritious fruit. Prior to the evolution of color vision, it possessed primitive red. To different species, it presents different striking colors. As it happens, Bargle's population evolves a color system that makes it look red. Therefore, on viewing the fruit, Bargle gets it right. Even though Bargle gets it right, this case also illustrates Independence. The fact that the physical properties of the fruit necessitate red had no causal influence on the evolutionary process that lead to his possessing a color system that make the fruit look red.

Independence is not true of primary quality perception. The difference, I suggest, is due to a difference in the metaphysics of primary qualities and secondary qualities. The shape of a thing affects considerably its pattern of interaction with other things. Shape systems evolved in order to make percipients' behavior in step with the shape-endowed causal powers of things. This selection pressure determines that species will come to perceive objects as having roughly the shapes they actually do have. Hence, in the case of shape perception, enhancing fitness is

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<sup>8</sup> Campbell (1993, 264) in effect asserts that Independence is false, yet he does not provide any account of how the response-independent primitive colors of objects could have helped to causally influence the evolutionary process.

the same as enhancing veridicality. By contrast to shapes, colors are fairly acausal. I have granted that Campbell's Response-Independent Primitivism avoids Epiphenomenalism: primitive colors at least cause our color experiences. Maybe we can even say that on this view the primitive colors of objects make a difference to color mixing. Nevertheless, on any view, primitive colors are *fairly* Acausal: they do not much affect how objects interact with one another or our bodies. They do not determine whether foods are healthy or poisonous, or whether animals are dangerous or innocuous. Indeed, this is a point which Campbell himself emphasizes: color, he says, does not have "wide cosmological role" (1993, 264). As Stroud (2000, 176) puts the point, billiard balls behave the same way whatever their color. Color systems cannot evolve in order to make our behavior in step with the color-endowed causal powers of things: there are not any. Therefore, the actual primitive colors of objects (the "chromatic laws") cannot have influenced what color systems evolve in this manner. And there is no other mechanism by which the primitive colors of objects might have influenced the evolution of color vision. Evolution completely ignores them.<sup>9</sup>

Of course, if the Simple Causal Theory of color content were true, then Independence would be false. On this view, we were bound to evolve to normally experience the colors that were actually out there because we were bound to experience whatever colors of objects our

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<sup>9</sup> Independence should not be confused with another thesis about the evolution of color vision. According to this thesis, as between the two factors identified above, namely (i) selection pressures and (ii) chance factors, chance factors play the dominant role in determining what color vision system evolves in any given lineage. For instance, there are many different color-schemes that would allow a population to distinguish fruit from the background foliage. Exactly which color-scheme evolves in the population is largely undetermined by selection pressures; instead, it is determined by the series of mutations that happen to occur in a lineage. Call this *Unconstraint*. Of course, this thesis comes in different degrees depending on the extent to which one believes that selection pressures fail to constraint what color vision system we evolve. Chalmers (2006, 69) endorses Unconstraint when he says that evolutionary processes are "indifferent between" communities that have different forms of color vision. (But Chalmers tells me that he only endorses a weak form of Unconstraint according to which that selection pressures are indifferent only to certain *types* of variation in color-schemes.) The difference between Independence and Unconstraint is plain. Even if Unconstraint is false and every feature of color vision is a strict product of selection pressures, Independence is still true because the selection pressures operating on a population are independent of the primitive colors of objects. Independence is not the claim that what color vision system evolves in a lineage is not determined; it is rather that it is determined by factors independent of the actual primitive colors of objects (the actual "chromatic laws"). The argument to be given only relies on Independence; Unconstraint plays no role.

color systems came to causally detect. On this view, it was a bit of luck that, before we came on the scene, fruit and the background foliage possessed highly contrasting primitive colors, so that, when we did come on the scene, we were able to easily distinguish them. (As we shall see in §8, Response-Dependent Primitivism offers a rather different picture: rather than what objects colors possess determining what colors they came to look to have, what colors they came to look to have determined what colors they came to possess.) But cases like that of Bargle and Argle (§2) show that the Simple Causal Theory is false. If objects possessed primitive colors prior to the evolution of color vision, the colors we came to perceive objects as having was not wholly determined by what primitive colors the states of our color systems are normally caused by.<sup>10</sup>

Independence is also not threatened by Campbell's assertion that the primitive colors of objects cause our color experiences. Even if the response-independent primitive colors of objects and not the underlying reflectance properties count as causes of our color experiences, this does not guarantee that we so evolved that every primitive color normally causes an experience of that very primitive color. For instance, this does not mean that primitive grey objects could not regularly cause in some population experiences of bright red, as in the unhappy case described above. In short, even if there is chromatic causation, this does not prevent there being non-matching chromatic causation.

##### **5. Against the Moorean Argument for Response-Independent Primitivism**

I begin by using Independence to argue that the simplest version of Response-Independent Primitivism entails that there is widespread

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<sup>10</sup> The thesis of *co-evolution* also does not impugn Independence. Suppose that a fruit has reflectance  $R$ . It benefits the fruit if it is not eaten until it is ripe and its seeds are ready for dispersal. In addition, it benefits some animal population if it is able to discriminate ripe fruit from the background. Suppose that, as a result, the fruit evolves so that it has reflectance  $R^*$  when it is ripe, and that the animal population evolves a color vision system which interacts with  $R^*$  objects to produce an experience as of a vivid primitive color, for instance bright red. It is controversial whether such co-evolution takes place (Regan et al. 2001). But even if it does, it does not threaten Independence. Maybe the response-independent chromatic laws are that  $R$  necessitates a shade of grey, and that  $R^*$  necessitates an even duller shade of grey, so that there is illusion throughout this process of co-evolution. Maybe, by a happy coincidence,  $R$  necessitates a shade of red, and  $R^*$  instantiates an even brighter shade of red, so that there is veridicality throughout the process of co-evolution. Either way, the chromatic laws did not make a difference to the process.

chromatic error and ignorance. In the subsequent section I will generalize the result to other versions.

There are two views on non-human color vision. (i) Human color space contains all the possible colors. There are no “alien colors” – colors other than those experienced by humans. Different species experience different colors from the same color space. So, for instance, where a fruit looks red to us, it might look green to a squirrel monkey. (ii) There are color spaces besides human color space, containing colors alien to our color space. Different species experience colors from different color spaces. For instance, where a fruit looks red to us, it might present to a squirrel monkey some color we cannot imagine. Our color space contains unitary colors red, green, yellow and blue, as well as colors that are in some perceptual composites of the unitaries. The alien spaces may have a similar structure (Thompson et al. 1992). If one accepts this view, one might hold that objects can have more than one color. An object might have a color from human color space and a color from an alien color space.

The *One Color Version* of Response-Independent Primitivism rejects this last claim. It is neutral on whether there are alien color spaces. But it denies that objects can have more than one color:

*Strong Exclusion:* If  $C$  and  $C^*$  are distinct minimal color shades (e. g. unitary red<sub>17</sub> and red-yellow<sub>28</sub>), then they exclude. In other words, necessarily, no surface instantiates both  $C$  and  $C^*$ . This is so even if there are alien color spaces, and  $C$  and  $C^*$  belong to different color spaces. A *minimal shade* is a color which is such that there is no more specific shade of that color. (This qualification is needed because an object can have two non-minimal color shades: for instance, some objects are red and bright red, purple objects are reddish and bluish, and so on. Indeed, maybe an object can be reddish and greenish (Hardin 1988, 125). These are not counterexamples to Strong Exclusion.)

*One Color:* Consequently, even if there are alien colors, every object has only one response-independent minimal primitive color.

Should the Response-Independent Primitivist accept Strong Exclusion? Here is an argument for Strong Exclusion. In general, determinates under a common determinable exclude. For instance, distinct shapes exclude. Even if two colors belong to different color spaces, they fall under a common determinable: both are colors. So we have reason to believe that all colors exclude. This argument is not decisive. Indeed, it may seem that the Realist Primitivist should hold that there are alien colors, and that a single surface might instantiate a color from our color space and an alien color. But I do not think that the situation is fundamentally altered if we move to such liberal versions of Realist Primitivism. Therefore, to illustrate the argument, I begin with the simple case.

Consider the fruit  $f$  that looks different in color to Bargle and Argle (§2). For instance, maybe it looks bright red to Bargle and dull brown to Argle. On the One Color Version,  $f$  cannot have both of these primitive colors. Maybe it is only dull brown. Then Argle gets it right while Bargle gets it wrong. This, it might be said, is objectionable because it “imposes an asymmetry on what otherwise seems to be a quite symmetrical situation” (Chalmers 2006, 68) or because it requires “ad hoc stipulation” (Cohen 2004, 256). My objection is rather that Independence means that the One Color Version has the same anti-commonsensical consequences as Cornman’s epiphenomenalist version of Realist Primitivism. First, barring a pre-established harmony, it entails that it is probable that every species fails to perceive the true color of most every object. Call this *Widespread Error*. Second, it entails that, in cases where an individual does get it right, he occupies a Gettier-like scenario in which he gets it right by blind luck. Intuitively, this means that, even in cases where he gets it right, he cannot be credited with chromatic knowledge. Call this *Ignorance*.

It is obvious that the conjunction of Independence and the One Color Version entails that there is widespread error across the animal kingdom at large. On this view, the fruit  $f$ , for instance, has only one color, say  $C_3$ . Given variation, it presents different colors  $C_1, C_2, C_3, C_4, \dots$  to different species. Presumably, these colors belong to completely different color categories. Therefore, the One Color Version implies that many species regularly perceive it as having a color that differs considerably from its actual primitive color. But we may make a stronger claim. The conjunction of Independence and the One Color

Version entails that it is very probable that there is widespread chromatic error *within* every species. Given Independence, there was no supernatural force that saw to it that any one species evolved a color system that makes every object look to have exactly the color that it had prior to the evolution of color vision. Therefore, chromatic error is probably evenly distributed among the animal kingdom. Given the great variety in the forms of color vision, all creatures endowed with color vision, including human beings, are likely to regularly perceive a great many objects as having colors that differ considerably from their actual primitive colors. Indeed, it is possible that the primitive colors of some objects are not correctly perceived by any species. To see this, just run through a thought-experiment. Imagine another planet before the evolution of creatures with different forms of color vision. If the One Color Version and Independence are true, then it is very likely that every species will evolve a color system that makes most objects look to have colors that differ considerably from their actual primitive colors. Call this the *Independence Argument*.

Of course, even if the One Color Version and Independence are true, it is *possible* that one species won the chromatic lottery with respect to every object. For instance, maybe, by a grand coincidence, the series of mutations that occurred in the ancestors of squirrel Monkeys, together with the unique set of selection pressures operating on them, resulted in their possessing a color system that makes every object look to have a color that more or less coincides with the single primitive color it possessed prior to the evolution of color vision. All other species, include *homo sapiens*, are completely in the dark as to the colors of things. But this is improbable in the extreme.

Consider next the claim that the conjunction of Independence and the One Color Version entails Ignorance: that we cannot be said to know even in those cases in which we happen to get it right. Suppose that we are victims of chromatic error with respect to objects *a, b, c, d, e, . . .* But, with respect to fruit *f*, we happen to get it right. Maybe, prior to the evolution of color vision, *f* possessed the primitive color bright red. And maybe the series of mutations that occurred in our ancestors, together with the unique set of selection pressure operating on them, resulted in our possessing a color system that makes *f* look bright red. Given Independence, this had nothing to do with the fact that the physical properties of *f* necessitated bright red. Rather, it was a lucky

coincidence. Other species were not so lucky. To them, *f* looks brown, green, or maybe an alien color. Now ordinary people may be *justified* in believing that *f* is red: after all, it looks red to them and, not knowing the truth of the One Color Version and Independence, they have no reason to doubt the reliability of color vision. Yet, intuitively, if Independence and the One Color Version are true, then their belief that *f* is red does not constitute *knowledge* because they have a true belief about the color of *f* by “blind luck”.<sup>11</sup> Consider an analogy: imagine using some measuring instrument that, unknown to you, is calibrated entirely by chance. Consequently it is miscalibrated with respect to nearly all objects but happens to be correctly calibrated with respect to one object. Your belief about this one object is true, but it intuitively does not constitute knowledge. Likewise, I say, in the present scenario. (Mark Johnston (2006, note 20) holds that in the “good cases” experience discloses the actual instantiations of colors by objects, yet he would seem to agree that in the present type of case individuals cannot be credited with knowledge.) I do not derive this judgment from a Sensitivity Principle or a Safety Principle or some principle to the effect that a certain kind of epistemic luck is incompatible with knowledge. I found my judgment on my intuition about the single case. In my view, our intuition about the case is on firmer ground than any general principle.<sup>12</sup>

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<sup>11</sup> This case differs from most of Bonjour’s (1980) cases in two respects. First, in all of the Bonjour’s cases, an individual is using a belief-forming method that is completely reliable. By contrast, in this scenario, we using a method, namely color vision, which is unreliable with respect to most objects, but which happens to be reliable with respect to *f*. (Therefore a reliability theory endorses my intuition. Indeed, on this view, not only does our belief not constitute knowledge: it is not even justified.) Second, in most of Bonjour’s cases, the individuals involved do have some reason of an internalist sort to doubt the reliability of the methods they are using. By contrast, in the scenario described, ordinary individuals do not know the truth of the One Color Version or Independence and therefore have no reason to doubt the reliability of color vision.

<sup>12</sup> As noted, Chalmers’s (2006) main objection to the One Color Version is that it requires “asymmetrical color facts”. But he also very briefly suggests that this view raises a skeptical worry. In response, Byrne and Hilbert (forthcoming, 21) claim that Chalmers’s argument requires, what they claim is false, that “that mutations producing genes for spectrum inversion could easily have occurred”, so that “it easily could have happened that many or all humans existing in the 21st century were inverted in one way or another”. The present argument differs from Chalmers’s argument. First, my primary aim is to undermine the Moorean Argument for the One Color Version by showing that the One Color Version has an anti-commonsensical *metaphysical* result, namely that we are very probably the victims of widespread chromatic error. The claim that the One Color Version entails Ignorance is secondary. Second, the present argument invokes Independence, while Chalmers’s argument appears to invoke Unconstraint (see my note 9). Third, Chalmers’s argument for Ignorance appears to hinge on

But even if one does not share my intuition that the conjunction of the One Color Version and Independence entails Ignorance, the fact that it entails Widespread Error is enough to defeat the Moorean Argument for the One Color Version of Response-Independent Primitivism. The Moorean Argument has it that we should accept Response-Independent Primitivism over Eliminativism because it accommodates our pretheoretical, commonsense beliefs better than Eliminative Primitivism. But we have found that, at least in the case of the One Color Version, this is simply not true. On this view, it is overwhelmingly likely that we are the victims of widespread chromatic error. This view entails that objects have colors but that they are cognitively closed off from us. This is hardly the commonsense view. Now I will now argue that the problem extends to liberal versions of Response-Independent Primitivism which maintain that every object has several primitive colors.

#### **6. Liberal Versions of Response-Independent Primitivism**

Consider the following exclusion theses, the first of which we have already encountered:

*Strong Exclusion:* For all colors  $C$  and  $C^*$ , if  $C$  and  $C^*$  are distinct minimal shades, then they exclude, whether they belong to the same color space or to different color spaces.

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the claim that people have a justification of the internalist sort for believing that color vision is unreliable, namely that “only a very small subset of the class of . . . possible perceivers will normally have veridical experiences, and there is no particular reason to think that we are among them” (2006, 69). This argument does not show that ordinary unreflective people fail to know what the colors of things are. Of course, ordinary unreflective people, not knowing that Independence and the One Color Version are true, are not in possession of such a theoretical reason to doubt the reliability of color vision. (Chalmers tells me that he only intended to show that theorists who accept the views in question do not know because such theorists are in possession of such a theoretical reason to doubt the reliability of color vision.) My argument differs from this argument. It is designed to show that, if the One Color Version is correct, then even when *ordinary people* get it right they lack chromatic knowledge for an *externalist* reason, namely that they have true color beliefs by luck. Finally, the argument I develop does not require the possibility of “inversion mutations”, or any other special assumptions about mutation history. Therefore it avoids Byrne and Hilbert’s objection. It only requires Independence: that what mutations actually did occur, and what mutations were selected against and what remain, was independent of the actual primitive colors of objects.

*Exclusion within Every Color Space:* For every color space  $S$  and all colors  $C$  and  $C^*$ , if  $C$  and  $C^*$  are distinct minimal shades and both belong to  $S$ , then  $C$  and  $C^*$  exclude.

*Exclusion within Human Color Space:* If  $C$  and  $C^*$  are minimal shades and both belong to human color space, then  $C$  and  $C^*$  exclude.

In the previous section, I considered a version Response-Independent Primitivist which upholds Strong Exclusion, and hence all the weaker exclusion theses listed here. And there is, indeed, reason to accept all of them. Intuition strongly supports Exclusion within Human Color Space. How could the same surface be unitary red<sub>17</sub> and red-yellow<sub>28</sub> all over, for instance? Given Exclusion within Human Color Space, one could argue by analogy that Exclusion holds within every color space. And, as noted in the previous section, one could argue for Strong Exclusion on the ground that in general determinates falling under a common determinable exclude.

Nevertheless, we can imagine versions of Response-Independent Primitivism which discard one or more of these principles. For simplicity, let us start with views that claim that there are two color spaces: Human Space and Alien Space. As we shall see, the points I will make extend to views according to which there are multiple color spaces (e. g. one for each species with color vision). In particular, consider the following views:

*Moderately Liberal Response-Independent Primitivism:* Exclusion within Every Color Space is true, but Strong Exclusion is false. Every object has only two minimal shades: one from Human Space, and one from Alien Space. For instance, an object might have a shade of yellow but no other color from Human Color Space; and a color from the Alien Color Space but no other color from that space.

*Radically Liberal Response-Independent Primitivism:* All color-exclusion theses are false. Every object instantiates every color from every color space – perhaps as a matter of metaphysical necessity.

Does the Independence Argument developed in the previous section extend to these forms of Response-Independent Primitivism? The Independence Argument extends to Moderately Liberal Version. To see this, consider the following analogy involving dart boards. There are two dart boards, representing the Human Space and the Alien Space. The analogy is apt because, ignoring saturation and brightness, a color space (or at least human color space) can be represented by a circle in which the “unitary” colors are at 12 o’clock, 3 o’clock, 6 o’clock and 9 o’clock and the “binary” colors are in-between (Hardin 1988). Each dart board is divided into countless segments. On each dart board one narrow segment is lit up, while the rest are dark. The lit up segments represent the two actual primitive colors of some object  $f$ ; the dark segments represent the countless primitive colors which  $f$  does not possess. You are to throw a dart at the boards. But you are not to aim at the lit up areas; the actual lit up areas do not control where you throw the darts. Rather, some other factors determine where the dart will go. This feature of the case is analogous to Independence. Obviously it is very likely that you will hit a segment that is not lit up; and if you do hit one of the two lit up segments, you do so by accident. Furthermore, adding more dart boards does not affect the situation. It remains very likely that you will hit a segment that is not lit up; and if you do hit one of the two lit up segments, you do so by accident.

It is exactly the same in color vision. If  $f$  has two minimal colors from two different color spaces but no other colors from those spaces, and if in accordance with Independence these primitive colors do not determine what color systems evolve, then many species probably perceive  $f$  as having one of the many colors that it does not have, and there is a clear sense in which those species which perceive  $f$  as having one of the two primitive colors it does have do so by accident. Furthermore, as long as Exclusion within a Color Space is retained, adding color spaces does not change the situation. Given Independence, it is still true that it is very likely that a species will perceive  $f$  as having one of the many primitive colors that it does not have; and where a species does perceive  $f$  as having one of the primitive colors it does have, it does so by luck. This is an inevitable consequence of Independence and Exclusion within a Color Space. Therefore, the Moderately Liberal Version, no less than the One Color Version, entails the likelihood of Widespread Error and Ignorance.

Of course, the Radically Liberal Version does not entail Widespread Error. On this view, every object has every color, so that color illusion is not possible. The Radical Liberal may even say that it is a necessary truth that every object has every color. Then it is impossible to have false color beliefs! Some may say that this would mean that we could be credited with knowledge of the colors of things. But this view violates Exclusion within Human Color Space, which I regard as apriori. In any case, when it comes to accommodating common sense, it can hardly be said to have any advantage over Eliminativism.

I conclude that there is no version of Response-Independent Primitivism for which Campbell's argument is successful. It may be objected that the Independence Argument overgenerates. By the same reasoning, most of our ordinary beliefs are false or do not constitute knowledge. Since this is absurd, the argument must go wrong somewhere. My reply is that the Independence Argument does not overgenerate. The argument is local and conditional. For these reasons, it does not necessarily extend to other domains, such as mathematics or morals. The Independence Argument is local because it depends on Independence, and Independence is not true of other belief-forming systems. For instance, as we saw in §4, it is not true of shape systems. In the case of shape, enhancing fitness is tantamount to enhancing veridicality. The same is arguably true of our other beliefs about the world. The argument is also conditional. I only say that, if Response-Independent Primitivism is true, then Widespread Error and Ignorance follow. I do not say that all theories have these consequences. For instance, Matthen's (2005) account of color is tailored made to accommodate variation in color vision. In fact, I do not even say that all versions of Realist Primitivism have these consequences: McGinn's Response-Dependent Primitivism avoids them, as we shall now see.

### **7. Response-Dependent Primitivism**

Let us, then, turn to McGinn's quite different version of Realist Primitivism. Previously McGinn (1983) accepted *Reductive Dispositionalism*. He held that colors are identical with dispositions to produce color experiences. Recently (1996), he has converted to Primitivism: colors are primitive, non-dispositional, non-relational properties. But he retains an element of his old theory. For, unlike Campbell, he holds that what primitive colors objects instantiate is determined by their sensory ef-

fects on us and other perceivers. Necessarily, for every primitive color  $C$  and surface  $x$ ,  $x$  instantiates  $C$  iff  $x$  has the disposition to produce experiences of primitive  $C$  in creatures of kind  $K$  under normal conditions. McGinn (1996, 1999) holds that having an experience with a certain character consists in representing or being aware of a certain color property  $C$ . Thus, on his view, a color property “gets to be instantiated by objects in virtue of the fact that objects produce experiences in which that property is represented” (1996, 550).

It would be a mistake to say that on Response-Dependent Primitivism primitive colors are relational properties. A property  $P$  is *relational* iff  $P$  is identical with a complex property with the logical form or “real essence” of *bearing  $R$  to  $a$* , or *bearing  $R$  to something or other*. Since Response-Dependent Primitivism asserts that colors are simple properties with no logical form, it *entails* that they are *non-relational*. They are non-relational properties that are necessarily co-extensive with relational properties. This is a brute necessary connection.<sup>13</sup> As McGinn notes (1996, 546), his view therefore requires the rejection of the necessary co-extension criterion for property-identity.

In claiming that colors supervene on relational properties but are themselves non-relational, McGinn puts forward a theory that simulates Reductive Dispositionalism (more generally, relational views of color) while avoiding its unpalatable consequences. As McGinn explains, it avoids circularity and the phenomenologically implausible claim that colors are relational properties. In addition, it avoids the semantically implausible claim that there are hidden parameters in color predications concerning types of observers and viewing conditions. When he accepted Reductive Dispositionalism, McGinn said that ‘ $a$  is  $C$ ’ is true iff  $a$  looks  $C$  to normal humans under normal conditions. But now he may accept a Simple Semantics (§2): roughly, a color attribution ‘ $a$  is  $C$ ’ is true iff  $a$  instantiates primitive  $C$ . Likewise he may say that the belief that  $a$  is  $C$  is true iff  $a$  instantiates primitive  $C$ ; and

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<sup>13</sup> McGinn says that on his view it may be that “color properties themselves are categorical, simple, monadic, intrinsic features of objects, despite the fact that the properties they supervene on are dispositional, complex, extrinsic features of objects” (1996, 545). In my view, the claim that colors might be intrinsic even if sensory dispositions are extrinsic is not something which McGinn may accept. The notions of intrinsicness and extrinsicness are modal notions: roughly, a property is intrinsic iff it is independent of accompaniment. On McGinn’s view, colors and sensory dispositions are necessarily coextensive. They have the same modal profiles. So colors are extrinsic iff the sensory dispositions are extrinsic, and intrinsic iff sensory dispositions are intrinsic.

that a color experience in which an object *a* appears primitive *C* is veridical only if *a* instantiates *C*. On this view, only the supervenient simple property, not the complex relations to perceivers on which it supervenes, enters into the contents of our color assertions, beliefs, and experiences (McGinn 1996, 545).

Notice that on Response-Dependent Primitivism, by contrast to Response-Independent Primitivism, long-term color illusion is not possible. If a creature regularly responds to an object with an experience of primitive color *C*, then that object instantiates primitive *C*. This is an extremely important difference between Response-Independent Primitivism and Response-Dependent Primitivism. As we shall see in the next section, it means that McGinn's Response-Dependent Primitivism may avoid the problem about evolution and error that afflicts Campbell's Response-Independent Primitivism.<sup>14</sup>

## 8. The Moorean Argument for Response-Dependent Primitivism

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<sup>14</sup> Like me, Chalmers (2006) and Byrne and Hilbert (forthcoming) argue against Realist Primitivism. But, in my opinion, their arguments are not sufficiently *general*. In particular, McGinn's Response-Dependent Primitivism escapes their arguments. Chalmers says that the possibility of inverted spectra creates a dilemma for the Realist Primitivist: either he must accept that every object actually has only one color, or else that every object actually has every color. Against the first option, Chalmers claims that it requires that in cases of inverted spectra at most one individual gets it right, which requires an "unappealing asymmetry" (68). Against the second option, he says that it is implausible because it entails that all color experiences are veridical. As noted earlier (§5), I am not sure what is wrong with unappealing asymmetries (see also Byrne and Hilbert forthcoming, 19-20), and I would rather claim that the second option is unsatisfactory because it violates Exclusion. But there is a more basic problem. The dilemma is a false one: on McGinn's view, which Chalmers mentions but does not discuss, it is not the case that every object actually has every color because it is not the case that every object is actually disposed to produce every color experience under normal conditions; yet in hypothetical inverted spectra cases both individuals get it right, so "unappealing asymmetries" are avoided. Byrne and Hilbert argue that, depending on the version, Realist Primitivism either requires a "pre-established harmony" between the true colors of things and the apparent colors of things, or else is unmotivated. But McGinn's view, which Byrne and Hilbert mention but do not discuss, does not require a pre-established harmony; as we have seen, on this view, veridicality under normal conditions is assured by the modal profile of primitive colors. Nor is it unmotivated: as we shall see, it may be motivated by a revised version of the Moorean Argument. (Byrne and Hilbert also raise a general objection: that the Realist Primitivist – presumably even an Eliminativist Primitivist – cannot allow the possibility of alien colors because our color space is closed. But here I did not see the problem. Even if we grant that our color space is closed, why could not there be spaces of primitive colors completely closed off from human space?) As will become apparent, my argument against Realist Primitivism differs from these arguments. And it is a general argument that applies against any form of Realist Primitivism: it applies equally to McGinn's Response-Dependent Primitivism and Campbell's Response-Independent Primitivism.

Suppose that we have an argument for Reductive Dispositionalism. We do not need a further argument for Realism. For, on this view, colors are identical with properties of external objects, namely dispositions to produce color experiences. But McGinn now accepts Primitivism. Once we accept this view, why should we say that objects have primitive colors over and above their sensory dispositions? Why not accept Eliminativism, according to which objects have the sensory dispositions but not primitive colors? And if we accept Realism, why should we favor McGinn's view that primitive colors supervene on sensory dispositions over Campbell's view that they supervene on response-independent physical properties? We are justified in looking upon such a strange supervenience claim with suspicion until a strong argument is given. McGinn has little to say on these questions. He starts by simply assuming that it is desirable to treat colors as both "subjectively constituted and yet also features of external objects in space" (1996, note 1). But he gives no justification for continuing to accept this conception of color once the irreducibility of color is acknowledged.

I will consider some arguments for combing Primitivism with Response-Dependence. I will criticize the traditional *apriori* arguments of the kind which McGinn (1983) put forward when he accepted Reductive Dispositionalism. Then I will suggest that the only available argument for Response-Dependent Primitivism is a revised version of the Moorean Argument.

First, the traditional *Apriori Argument*. Part of Campbell's argument for Response-Independent Primitivism (§3) appears to be that it is part of common sense that colors, like shapes, are, in his words, "mind-independent". But many have said the opposite: that the commonsense view is that colors are response-dependent. Indeed, many philosophers, including the erstwhile McGinn (1983), have said that something like the following *Biconditional* is *apriori*: for all  $x$ ,  $x$  is red iff  $x$  produces experiences of red under normal conditions. This would provide an argument for combing Primitivism with Response-Dependence. As a bonus, the case for Realist Primitivism over Eliminativism would be straightforward: since some objects normally appear red, and since it is *apriori* that an object is red iff it normally appears red, we can infer that some objects are red.

The main problem with this argument is that the Biconditional is not *apriori*. (The objections to follow also apply to the claim that a ri-

gidified version of the Biconditional is apriori.) The claim ‘*a* looks red under normal conditions but is not red’ is not incoherent. Neither error under normal conditions nor wholesale Eliminativism about colors can be ruled out apriori merely by reflection on our color concepts (Tye 2000, 170). Nor is it apriori that if something is red, it looks red under normal conditions. For all we know apriori, there exists in the actual world a red object which is constitutionally forbidden to look red under normal viewing conditions. For instance, we may imagine a red microscopic object for which ‘normal viewing conditions’ seems undefined.<sup>15</sup>

Next, let us consider the *Argument from Variation*. Previously McGinn used this type of argument to show that colors are *identical with* relations to perceivers, and in particular, dispositions to look colored (McGinn 1983; see also Cohen 2004). But here we are assuming McGinn’s Primitivism, according to which colors are simple, non-relational properties. So we are assuming that this view is false. Still, one might think that the argument may be used to show that primitive colors *supervene on* such relations to perceivers. Indeed, McGinn (2000) appears to think that the argument may be so used. Here I will criticize only this appropriation of the argument.

The argument is as follows. Consider, for instance, a case of the kind discussed in §2. Suppose the fruit *f* looks primitive red to Bargle under normal conditions, and it looks primitive green to Argle under normal conditions. Bargle says ‘that is red’ and Argle says ‘that is green’. (I assume that both speak something like English.) There are three options. *One Wrong*: one gets it wrong and the other gets it right. *Both Right*: both get it right. *Both Wrong*: both get it wrong. The argu-

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<sup>15</sup> Insofar as intuition supports the Biconditional, I believe that the intuition may be explained away. Even if objects have colors, they are fairly Acausal (§4). This means there is no “Independent Test” in the case of color (at least not one that is readily available): the only possible way of coming to justified opinion as to whether or not something has a certain color is by looking at it. This is true even if colors are response-independent. So even if colors are response-independent, we might be inclined to think, mistakenly, that there is no gap between the chromatic “evidence” (that something looks red under normal conditions) and the chromatic facts (that it is red), because we know that the chromatic evidence cannot be defeated in the future by other methods. Thus we might be inclined to think that to have a color is just to look to have that color under normal conditions. Consider by contrast shape. There are many tests for whether an object has a certain shape besides visual perception. Therefore we have no tendency to think that the facts about shape reduce to facts about shape appearance. Since we would have a tendency to believe that colors are response-dependent even if colors were response-independent, it is difficult to treat it as evidence of response-dependence.

ment now has two stages. The first stage is a plausibility argument for Both Right. Since Biconditional is not apriori, Both Right does not follow apriori from the facts of the case; the idea of the present argument is that it is in some sense the *best* option. One Wrong requires that the physical properties of *f* necessitate one primitive color rather than another, and this may seem arbitrary (see §12). To accept Both Wrong in every such case is to accept Eliminativism, and hence is revisionary. The best option, then, is Both Right. The second stage goes from Both Right to Response-Dependent Primitivism. Of course, the argument generalizes to other variation cases. If in all such cases the object instantiates both the presented primitive colors, this suggests that what primitive color an object instantiates supervenes on what color experiences it produces in percipients.

Both stages are problematic. The first stage is problematic for two reasons. First, it is not obvious that Both Right is the best option. True, One Wrong requires arbitrary color facts and Both Wrong is revisionary. But Both Right has a cost too. Intuitively, Both Right cannot be right. Intuitively, when Bargle says ‘that is red’ and Argle says ‘that is green’, they are expressing incompatible beliefs. Likewise, when two individuals with slight differences in their color vision systems look at the same chip, and one says ‘that is unique blue’ and the other says ‘that is green-blue’ (§9). Of course, on an appropriate theory, their beliefs are not incompatible; but it must be admitted that many people have the strong pretheoretical intuition that their beliefs *are* incompatible, so that any theory that violates the intuition has a cost. The fact that all the options have problems is reflected in the fact that ordinary people are at a loss as to what to say about such cases. Some favor Both Right; some are moved to thoughts of Eliminativism; and some think that there is a hidden fact as to who gets it right. It is not as if they all hone in on Both Right. Second, suppose we all did find Both Right the best option. If colors are primitive, why should this be evidence that Both Right is correct, that is, that the object instantiates both primitive red and primitive green? If colors are primitive, why should their pattern of instantiation obey our offhand judgments? For these reasons, given Primitivism, the plausibility argument for Both Right is very weak. This, in my view, is the main problem the Argument from Variation. But its second stage is problematic as well, because even if Both Right is correct in such cases, this does not show that primitive colors

are constitutively tied to dispositions to look colored. It may be that primitive colors are response-independent, but Both Right is correct because objects have many colors.

In the end, I believe that the Response-Dependent Primitivism has no choice but to resort to the *Moorean Argument*. Response-Dependent Primitivism is not susceptible to the Independence Argument. On Response-Dependent Primitivism, Independence is false. It is not the case, on this view, that the primitive colors of things and what color system evolves in a certain population are independent. We evolved so that objects present certain primitive colors to us owing to the unique set of selection pressures operating on our ancestors. Nutritious fruits and their leafy backgrounds present to us highly contrasting primitive colors. On Response-Dependent Primitivism, they consequently possess those primitive colors. Other creatures evolved so that objects present different primitive colors to them. On Response-Dependent Primitivism, they consequently instantiate those primitive colors also. McGinn is a chromatic liberal: all species generally get it right, on his view. On Response-Independent Primitivism, primitive colors of objects *co-evolve* with color systems. So, when we get it right, this is no accident. Further, no matter what color system we had evolved, we would have had generally true color beliefs. Our color beliefs are guaranteed to track the truth in a wide range of counterfactual worlds. There is no sense in which they are true by luck. Therefore, McGinn's view not only accommodates the commonsense belief that we generally get it right; on a broadly anti-luck account of knowledge, it also accommodates *Knowledge*: the commonsense belief that we have chromatic knowledge. This suggests the Moorean Argument may succeed when it is applied to Response-Dependent Primitivism. Campbell holds that Revelation, Realism and Response-Independence are part of common sense. But, given Independence, his view accommodates Response-Independence at the cost of implying Widespread Error and Ignorance. The Response-Dependent Primitivist may say that the core components of the commonsense view are Realism and Knowledge, and that the folk have no opinion on Response-Independence and Response-Dependence, as witness their variable responses to variation cases. In fact, then, maybe the version of Primitivism which best accommodates our commonsense view of color is not Response-Independent Primitivism but Response-Dependent Primitivism. The

case for accepting Response-Dependent Primitivism, once we accept Primitivism, is not that Response-Dependence is a priori. Rather, it can only be that the resulting view accommodates Knowledge as well as Realism, and hence best accommodates our commonsense view of color. This is not the argument offered by McGinn; but it seems to me that it is the best argument available to him. Of course, epistemological arguments for Response-Dependent theories of a subject matter are hardly new: consider Berkeley's epistemological argument for Phenomenalism over Lockean Realism, or epistemological arguments for Mathematical Constructivism over Platonism.

I believe that the present application of this type of argument is misguided. Given a certain theory of content, I can see how commonsense considerations justify one *reductive* theory over another. Redness is identical with physical property *P* iff the semantic value of 'red' is *P*. On a *Best Fit Theory* of content (Lewis 1984), the semantic value of 'red' is the property that best fits our commonsense beliefs, such as Realism, Knowledge, and Revelation, together with our beliefs about what is red in actual and counterfactual circumstances. In other words, such beliefs are *subject-determining*. Suppose that the *disposition to produce red experiences* (rather than, say, a certain reflectance property) best fits our beliefs and use. Then it follows that 'red' refers to this property. (This is only an illustrative example. Johnston (1992) in effect argues that the Best Fit Theory of how color terms refer leads to referential indeterminacy, so that what theory of color we accept becomes a matter for conceptual revision guided by pragmatic considerations.) Thus the best fit theory explains how commonsense beliefs may have a role in justifying one philosophical theory over another. But, once Primitivism is accepted, I find it mysterious that our commonsense beliefs should matter. Grant that Knowledge is true only if the non-relational primitive colors of objects somehow necessarily march in step with their perceptual effects on human beings. How does this raise the epistemic likelihood that this is indeed the case? Why should we assume that nature is so obliging? This would seem to be mere wishful thinking. To answer this question, I do not see how the Best Fit Theory of content could help.

But even if we set aside skepticism about the use of Moorean considerations to justify Response-Dependent Primitivism, the Moorean Argument for Response-Dependent Primitivism fails on its own terms.

As we shall now see, while it may avoid Widespread Error and Ignorance, it has other anti-commonsensical consequences. In fact, in my view, it may be ruled out apriori.

### **9. Against the Moorean Argument for Response-Dependent Primitivism**

Depending on the version, Response-Dependent Primitivism violates Exclusion or has equally implausible consequences. The problems arise out of biological variation and standard variation in color vision. The Reductive Dispositionalist may avoid the problems by adopting a contextualist theory of color attributions. But the Response-Dependent Primitivist cannot overcome the problems in this way.

Exclusion states that no surface can have distinct minimal shades. It may be that the Reductive Dispositionalist can accept Exclusion (McGinn 1983). For he may adopt a contextualist semantics (McLaughlin 2003, Cohen 2004). A simple version of contextualism might hold that a color predication '*a* is *F*' expresses a truth in context *C* iff *a* looks *F* under each of the conditions that are "relevant" in *C*. A *condition* is a fine-grained specification of a subject's internal wiring and the conditions under which he views an object. In the case of humans, the relevant conditions are linked to human beings. Now, on this semantics, the sentence 'no surface have distinct minimal shades' expresses a truth in context *C* iff no surface can look to have distinct minimal shades under each of the conditions that are relevant in *C*. Since a surface cannot look to have distinct minimal shades under *any* single condition, 'no surface have distinct minimal shades' is bound to express a truth in every context.

But now consider Response-Dependent Primitivism. On this view, there is a single, non-relational property *red*. Further, *x* instantiates primitive *red* (simpliciter) iff *x* is disposed to normally produce an experience as of primitive red in some kind of creatures *K*. But what creatures? One answer is humans. But this is deeply implausible. It is not implausible to suppose that the truth-conditions of some *sentences* of English are linked to humans. After all, they are sentences of our language. But it is implausible that the instantiation-conditions of a *primitive non-relational property* are necessarily linked to humans. Primitive red might be perceived by other creatures, for instance monkeys or Martians. Why should the instantiation-conditions of primitive red be linked to humans rather than to monkeys or Martians? To avoid inex-

plicable arbitrariness, the Response-Dependent Primitivist should first try the following:

*The Liberal Version:* For every primitive color  $C$  and surface  $x$ ,  $x$  instantiates primitive  $C$  iff  $x$  is disposed to normally produce experience of primitive  $C$  in *some creature or other* – not necessarily humans.

This seems to be McGinn's view. He says that, if objects present different primitive colors to Martians than they present to us, then Martians get it right too (1996, 545-46). This seems to require the Liberal Version. But biological variation in color vision means that the Liberal Version violates Exclusion. In a case of biological variation, the same object normally produces experiences of different colors in individuals from different species. Consider one of McGinn's favorite examples. In some possible world  $W$ , an object is disposed to produce experiences of the monadic property *red* in humans and is disposed to produce experiences of the monadic *green* to Martians. So it is disposed to look *red* to some creature or other, and it is disposed to look *green* to some creature or other. On the Liberal Version, it follows that in  $W$  the apple instantiates both the monadic property *red* and the monadic property *green*. Don't say: the Liberal Version only implies that it instantiates *red relative to humans* and *green relative to Martians*. Although he holds that they supervene on relational properties, McGinn holds for phenomenological reasons that *red* and *green* are monadic, non-relational properties. They are on a par with electric charge. Therefore, on his view, such locutions make no sense. The Liberal Version entails that in  $W$  the apple instantiates redness *simpliciter* and greenness *simpliciter*. Given the Simple Semantics and standard rules for modal operators, the Liberal Version further entails 'no surface can be red and green' expresses a falsehood in the actual world. In fact, we can imagine a world in which, for every object  $x$  and every color experience  $E$ , there is some creature  $C$  such that  $x$  is disposed to produce  $E$  in  $C$ . In such a world, according the Liberal Version, every object instantiates every primitive color. Therefore, while the Reductive Dispositionalism of the erstwhile

McGinn might accommodate Exclusion, the Liberal Version of his new theory squarely violates it.<sup>16</sup>

In my view, Exclusion is apriori and non-negotiable. At least, it is more plausible than any theory of color. Primitivists, especially, have no business rejecting it. On a Primitivist theory, colors are non-relational properties on a par with shape or electric charge. Therefore we have no more reason to doubt that distinct colors exclude than we have reason to doubt that distinct shapes or electric charges exclude. For these reasons, I believe that we have heard enough to rule out the Liberal Version. But a weaker point applies. In rejecting Exclusion, the Liberal Version violates a central component of the commonsense conception of color. Indeed, it may even be a more central component of our commonsense conception than Realism. (Many would accord to Exclusion an apriori status, but no one would claim this status for Realism.) This significantly undercuts any attempt to justify acceptance of the Liberal Version with the Moorean Argument.

At this point, the Response-Dependent Primitivist might opt for:

*The Chauvinistic Version:* For every primitive color  $C$  and surface  $x$ ,  $x$  instantiates primitive  $C$  iff  $x$  is disposed to produce an experience of primitive  $C$  in *humans* under normal conditions.

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<sup>16</sup> McGinn could not resist this argument by adopting a Relative Truth Theory of color predications. (For a discussion of the type of theory I have in mind, see Egan, Hawthorne and Weatherson 2005.) For the purposes of illustration, suppose we accept a Russellian framework according to which propositions are structures of objects and properties or relations. If we adopt this framework, the Relative Truth Theory claims that 'is red' expresses a two-place relation  $R(x, y)$  whose first place is filled by an *object* and whose second place is filled by a *type of creature*. This relation might be glossed as follows:  $x$  is disposed to normally produce red experiences in creatures of type  $y$ . On this view, then, the semantic value of the sentence 'the apple is red' is an unsaturated entity. For 'is red' contributes the two-place relation  $R(x, y)$ ; 'the apple' contributes an object which is filled by the first slot of this two-place relation; but the second slot remains unfilled. In effect, on the Relative Truth Theory, the semantic value of 'the apple is red' is a *property* – a property of types of creatures. Therefore, it is not something which is true or false *simpliciter*, but something which is true or false (instantiated or not instantiated) only relative to a type of creature. This would allow one to say that the semantic value of the sentence is true relative to humans but false relative to Martians. McGinn (1996) cannot accept this theory because his chief aim is to establish on phenomenological grounds that the color red – the semantic value of 'is red' – is a monadic, non-relational property. Therefore his view is incompatible with the claim that it is a relation between objects and types of perceivers.

The Chauvinistic Version avoids the counterexample to Exclusion involving Martians. The object normally presents primitive red to humans and primitive green to Martians. On the Chauvinistic Version, the object instantiates *primitive red* but not *primitive green*. Martians are subject to long term color illusion. But, as noted above, this type of view faces an *Arbitrariness Problem*. Consider the Special Composition Question: under what conditions do  $x$  and  $y$  have a fusion? It would be implausible to answer: iff  $x$  and  $y$  are edible by humans. For it is implausible that the basic modal facts about composition essentially involve humans. The same is true for the conditions under which an object instantiates a given primitive color. Consider primitive red. Objects produce experiences of primitive red in Martians as well as humans. According to the Chauvinistic Version, the pattern of instantiation of primitive red in nature is necessarily connected with humans. But why should it be humans and not Martians or pigeons or bears or dogs that matter? There is no way to “explain” this necessity as arising of semantic conventions. Rather, it would be a bizarre, synthetic, *in re* necessity.

So far I have discussed cases of *biological* variation: cases in which the same objects normally look different in color to individuals belonging to different species. But Response-Dependent Primitivism also faces problems arising out of cases of *standard* variation in color vision: cases in which the same objects normally look different in color to individuals belonging to the same species. For instance, because of slight differences between John and Jane’s retinal apparatuses and optic nerves, a color chip might look true blue<sub>4</sub> (a blue not tinged with any other colour) to John and greenish-blue<sub>5</sub> to Jane (a shade of blue slightly tinged with green). Nevertheless, by ordinary standards, neither individual has defective color vision. Individual differences in color vision are rife (Kuehni 2004). The same objects look different fine-grained colors to different perceivers, even where none of the perceivers counts as having defective colour vision. Further, it appears that standard variation may be quite extreme (Malkoc et al. 2005). While the chip looks blue to John, it might present to other normal individuals shades belonging to completely different color categories: for instance shades of *purple*. Now the problem for the Response-Dependent Primitivism is as follows. Let the *fine-grained condition* under which a subject views an object include the precise state of his retina and the wiring leading from the retina to his visual cortex, the subject’s states of adaptation, and

the external lighting and other relevant external conditions. The Response-Dependent Primitivist claims that a surface  $x$  instantiates true blue<sub>4</sub> iff  $x$  produces an experience of true blue<sub>4</sub> in creatures of kind  $K$  under normal conditions. But how are we to interpret *under normal conditions*? What fine-grained conditions are normal? This is a problem for the defender of the Liberal Version and the defender of the Chauvinistic Version alike.

The Reductive Dispositionist might handle standard variation by accepting a contextualist semantics of color predications of the kind I described above (see also McLaughlin 2003 and Cohen 2004). On this view, there is no need to decide once and for all what viewing conditions are relevant: the relevant viewing conditions are supplied by the context of utterance, so that what viewing condition is relevant varies from context to context. On this view, when John says ‘the chip is true blue<sub>4</sub>’, he expresses a truth, because the chip looks true blue<sub>4</sub> to him under the fine-grained conditions under which he views the chip. Likewise, when Jane says ‘the chip is greenish-blue<sub>5</sub>’, she expresses a truth, because the chip looks greenish-blue<sub>5</sub> to her under the fine-grained conditions under which she views the chip. Yet, strictly speaking, Exclusion is also accommodated because in every context ‘the chip cannot have two minimal shades’ expresses a truth.

But in answering the present ontological question the Response-Dependent Primitivist cannot go contextual. The Response-Dependent Primitivist believes that there is a single, non-relational, monadic, primitive color property *true blue<sub>4</sub>*. While the semantic value of a linguistic item can vary from context to context, it makes little sense to say that the instantiation-condition of a single property can vary from context to context. Therefore standard variation is much more problematic for the Response-Dependent Primitivist. He must give a single answer to the question, “What fine-grained conditions are relevant to the instantiation of true blue<sub>4</sub>?” As far as I can see, there are only three options available to him.

First, the Response-Dependent Primitivist might claim that many fine-grained conditions fall within the range of normal. In particular, the fine-grained condition under which John views the chip and the fine-grained condition under which Jane views the chip both count as normal. Further, he might hold that, necessarily,  $x$  instantiates maximally specific primitive color property  $C$  iff  $x$  is disposed to produce an

experience of primitive  $C$  in humans under *some normal fine-grained condition or other*. But this option, together with standard variation in color vision, entails that the chip instantiates a wide range of different non-relational, minimal color properties: true blue<sub>4</sub>, greenish-blue<sub>5</sub>, various shades of purple, and so on. Indeed, because standard variation is rife and extreme, it follows that every surface has a wide range of non-relational, minimal color properties – a range that spans different color categories. In my view, this view may be ruled out a priori. In any case, this result significantly undercuts any attempt to justify the acceptance of this view over Eliminativism with the Moorean Argument.

Second, the Response-Dependent Primitivist might claim that many fine-grained conditions, including the conditions under which John and Jane view the chip, are normal, but adopt a strict view:  $x$  instantiates primitive  $C$  iff  $x$  is disposed to produce an experience of primitive  $C$  in humans under *every* normal fine-grained condition. But this entails that no surface has any minimal color. The reason is simple: for every surface  $x$ , there is no *minimal* color property  $C_n$ , such that  $x$  produces an experience of  $C_n$  under *all* fine-grained conditions within the range of normal. For instance, owing to standard variation, the color chip does not look true blue<sub>4</sub> under all normal fine-grained conditions, as witness Jane. Nor does it look greenish-blue<sub>5</sub> under all normal fine-grained conditions, as witness John. Therefore, the present option entails that the color chip instantiates neither of these primitive colors. Similarly for every other minimal shade. In fact, the situation is more extreme. Because, as noted above, standard variation may be quite extreme, the chip does not look to have the *determinable* color *blue* under all normal fine-grained conditions. Under some normal fine-grained conditions, it may look *purple* to a subject (Malkoc et al. 2005). If this is correct, then the present option entails that the chip is neither blue nor purple. Thus, the present option yields an *error theory* of color. Objects have no determinate colors and arguably no determinable colors. This view is hardly better than Eliminativism.<sup>17</sup>

Third, the Response-Dependent Primitivist might take a rather desperate view. Let  $C_{77}$  be the condition under which John views the chip

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<sup>17</sup> Of course, the apparent empirical finding of Malkoc et al. 2005 may be denied. It may be said that the chip looks blue under every normal fine-grained condition. But then, together with Simple Semantics, the second option entails that ‘the chip is blue’ is (determinately) true but every instance of the chip is  $C_n$  is (determinately) false, where  $C_n$  is a minimal shade of blue. This is deeply counterintuitive.

and let  $C_{78}$  be the condition under which Jane views the chip. The Response-Dependent Primitivist might declare that, necessarily,  $x$  instantiates color-shade  $C_n$  iff  $x$  is disposed to produce an experience of  $C_n$  in humans under the very specific condition  $C_{77}$ . This option delivers the verdict that the chip instantiates true blue<sub>4</sub> but not greenish-blue<sub>5</sub>. However, this option faces the Arbitrariness Problem. Why is the instantiation of true blue<sub>4</sub> tied to  $C_{77}$  and not  $C_{78}$  or  $C_{79}$  or  $C_{80}$  or . . . There is no way to “explain” this necessity as arising of semantic conventions. Rather, it would be a bizarre, synthetic, *in re* necessity. This view defies belief. As if this is not bad enough, it is also in tension with Knowledge. Briefly, the problem is as follows. On this view, the instantiation of colors across all worlds is rigidly tied to condition  $C_{77}$ . Now it is in some sense a matter of luck that we so evolved as to regularly view objects under conditions that are more or less similar to  $C_{77}$ . On the present view, that is to say that it is a matter of luck that we so evolved as to experience objects as having colors that are more or less similar to their actual colors. In short, on this view, our color beliefs – even our determinable color beliefs – are actually true by luck. Intuitively, this is in tension with the claim that they constitute knowledge.

We have come to an end to our evaluation of the Moorean Argument for accepting Realist Primitivism over Eliminativism. The Moorean Argument has it that the ontological inflationism of Realist Primitivism is justified because it is required to accommodate our most deep-seated pretheoretical beliefs about the colors. The argument fails for a simple reason. The facts about evolution and variation in color vision mean that the available forms of Realist Primitivism violate common sense no less than Eliminativism.

### **10. The Perceptual Argument for Realist Primitivism**

Where do we stand? We have found that the Moorean Argument for accepting Realist Primitivism over Eliminativism fails. But it may seem that there is a simpler argument (Stroud 2000, 206). Objects look colored to us. And we have no reason to believe that “defeaters” obtain. Therefore, even once we accept Primitivism, one might think we have some reason to accept Realism. Call this the *Perceptual Argument*. It is a bit of a misnomer to call it an *argument*: it does not say that our belief that objects are colored is justified by some further premise or belief. Rather, the idea is that to justify our belief that objects are colored no

sophisticated argument from philosophers is required. Our simply having experiences of a certain kind justifies the belief. Of course, this argument does not show which form of Realism is right. Nor does it answer the problems raised above. But, one might think, it does provide some reason to continue to accept Realism even once we have accepted Primitivism.

Let us stack the cards in favor of the defender of the Perceptual Argument by assuming that Pryor's Dogmatism about perceptual justification is correct (2000). Roughly, this theory holds that, if  $x$  looks  $P$  to  $S$  and  $S$  has no reason to believe that defeaters obtain, then  $S$  has a justification for believing that  $x$  is  $P$ . No other conditions need be in place. On this view, ordinary people are justified in believing that objects are colored, even if Primitivism is correct. After all, objects look colored to them; and they are not in possession of philosophical arguments that defeat the justification provided by experience. But we are considering whether experience might provide philosophers who accept Primitivism with justification for believing that objects are colored. I think not. For as soon as one accepts Primitivism, one is in possession of two philosophical arguments that defeat whatever justification experience may provide. This follows from what has already been said.

First, once one accepts Primitivism, the Independence Argument gives me some reason to believe that, even if objects have primitive colors, color vision is unreliable. If objects have primitive colors at all, then they are response-independent or response-dependent. Of course, if they are response-dependent, then the reliability of color vision under normal conditions is assured. But one has good apriori reason to believe that this view is false. It requires a counterintuitive necessary connection between non-relational and relational properties. And, as we have seen, most versions have apriori absurd consequences. So one has reason to believe that, if objects have primitive colors, then they are response-independent. But then, by Independence, it would be a lucky accident if humans so evolved that objects generally look to them to have the primitive colors those objects possessed prior to the evolution of human color vision. Therefore, as soon as one accepts Primitivism, one has very good reason to doubt the reliability of color vision.

Second, once one accepts Primitivism, one comes to see that Realism requires a kind of Dualism at the surfaces of objects: an object is red iff it instantiates the primitive property *red* over and above its physical and dispositional properties. Therefore, as long as one accepts Primitivism, one has yet another reason to doubt the reliability of color vision.

### **11. The Psychosemantic Argument for Realist Primitivism**

Now I will consider a last-ditch attempt to justify Realist Primitivism over Eliminativism. The idea is that the hypothesis that external objects have primitive colors is required in order to explain how it is that we have experiences of color at all. Unlike the arguments considered so far, this argument is highly theoretical. Before we can fully understand the argument, we must have before us a more detailed account of Eliminativism.

Although it is not often done, it is important to distinguish between two forms of Eliminativism. *Strong Eliminativism* holds more than that it is not the case that objects have color properties; in addition, it holds that color properties do not exist. Analogy: not only is there no object which contains phlogiston, there is not even such a property as *containing phlogiston*. Note that Primitivism, as I have defined it, is compatible with Strong Eliminativism. Primitivism is the view that it is not the case that color properties are identical with physical or dispositional properties. That might be so because color properties do not exist at all. *Weak Eliminativism* says that color properties exist, but physical objects do not instantiate them. There are colors, and we are in some sense related to them in color experience; but there are no colored things. Color properties only live in the contents of our experiences. Analogy: one might think that there is such property as being a winged horse – I just referred to it. But it is not instantiated: nothing possesses this property. It only lives in the contents of our thoughts.

I accept Weak Eliminativism. There is a strong motivation for accepting Weak Eliminativism over Strong Eliminativism. We may distinguish between first-order and second-order claims about colors. First-order claims attribute color properties to objects. For instance, the claim that lemons are yellow is a first-order claim. Second-order claims attribute properties to colors themselves. For instance, the claim purple

is a binary color, or that shades of blue resemble shades of purple more than shades of green, are second-order claims. Second-order claims are about color properties rather than colored things (Jackson 1977b). Even if we reject first-order claims, visual experience justifies the acceptance of such second-order claim. Furthermore, while Independence provides a reason to doubt the reliability of first-order claims about the colors of things §10, there is no reason to doubt the reliability of such second-order claims. Since such claims require for their truth the existence of color properties, and since there is good reason to accept such claims, there is good reason to accept the existence of color properties even if we deny that external objects have these properties. However, the Mackie-style Simplicity Argument for Eliminativism that I shall present in the next section is neutral as between Weak Eliminativism and Strong Eliminativism.

Versions of Eliminativism vary along another dimension. *De Jure Eliminativism* holds that it is metaphysically necessary that physical objects do not instantiate colors. *De Facto Eliminativism* holds that physical objects do not instantiate colors, but that it is possible that they do (Johnston 2004b). It is sometimes said that Eliminativism leads to De Jure Eliminativism. For it is claimed that, if colors are not in fact instantiated, there can be no answer to the question: under what conditions *would* they be instantiated (Shoemaker 1994, 26; Tye 2000, 166)? But the Primitivist will say that there is an answer to this question. Since colors are simple properties, the answer is not very interesting: an object would instantiate red iff it would instantiate red. As far I can see, there is no simple argument that Eliminativists are committed to De Jure Eliminativism. The argument for Eliminativism I will offer here is neutral on this issue as well.

Boghossian and Velleman (1989) and Jackson (1977a) are Eliminativists who hold that colors are instantiated by mental objects of a certain kind, namely regions of the visual field. They are Eliminativists because they hold that colors are not instantiated by external objects. In my view, this theory of color experience is mistaken. Eliminativism should be combined with Intentionalism. On this combination of views, having a 'reddish' experience consists in "sensorily entertaining" the proposition that something is red, where sensorily entertaining is a special propositional attitude relation involved in experience (§2). But nothing has the color red: not an external object, not a mental object,

and certainly not the experience itself. What version of Intentionalism the Eliminativist can accept depends on what form of Eliminativism he endorses. The Weak Eliminativist can accept a *Russellian Intentionalism*: on this view, the proposition that something is red is a complex entity into which redness enters as a constituent. There are a variety of different versions of this view. On one version, the relevant proposition might be represented by the ordered pair <redness, being instantiated at  $l$ >, where  $l$  is a perceiver-relative location. The guiding idea is that redness exists but it is not instantiated: it only lives in the contents of our experiences. This view would require uninstantiated simple properties; but I do not see why we should be more dubious about them than we should be about abstract objects more generally. Not believing in redness, the Strong Eliminativist cannot accept this form of Intentionalism. But he can still accept Intentionalism. For instance, he might claim that the relevant proposition is built up from the concept of red rather than redness itself, and that this concept does not determine a property. Alternatively, he might claim that the proposition is a “seamless whole”, rather than a construction of more basic entities.

Like the Realist Primitivists I have examined, I accept the Simple Semantics (§4). In conjunction with the Simple Semantics, Eliminativism yields an error theory. On Simple Semantics, when we say ‘lemons are yellow’, we are attributing to lemons the very property that ostensibly enters into the contents of our experiences of lemons and determine their phenomenal character. On Eliminativism, it is not the case that lemons instantiate this property. The Eliminativist might resist this result. Often philosophers accept an eliminativist theory about a subject matter, but combine it with a semantics that allows them to say all that the realist says. Consider, for instance, the mereological nihilist who says that there is a table because there are atoms arranged tablewise. Likewise, the Weak Eliminativist might accept the following *Conciliatory Semantics*. On this semantics, the color *nominal* ‘yellow’ denotes a primitive property. Yet the color *predication* ‘the lemon is yellow’ is true as said by a human iff the lemon is disposed to normally produce in humans experiences that represent primitive yellow. In a sense, this is not a Dispositionalist view because it maintains that colors – the referents of color nominals – are primitive properties, not sensory dispositions. Yet it provides a dispositional analysis of color predications. (In effect, this is the conciliatory semantics of Jackson (1977a,

128), but with one difference: whereas on Jackson's semantics color nominals denote primitive properties of sense data, on the present semantics they denote uninstantiated primitive properties represented by our experiences.) On this semantics, our commonsense color judgments might be true even though Eliminativism is correct. So if this type of view could be maintained, then the Moorean Argument against Eliminativism would not even get off the ground. What is my argument for the Simple Semantics and an Error Theory over the Conciliatory Semantics? My argument is simply that the Simple Semantics is intuitive. Intuitively, in making a color predication, we are expressing our belief that an object has the very property presented to us in the color experience (Stroud 2000, 145ff; Johnston 2006, 264). We are naïve about color. So if it turns out that the object does not have the relevant property, we are simply wrong.<sup>18</sup>

We may now address the Psychosemantic Argument for Realist Primitivism over Eliminativism. Tye writes that, on Eliminativism, “[s]ince color qualities . . . are now simple qualities that exist only in the intentional contents of experiences, there seems to be no satisfactory way of explaining *how* our experiences represent *those* qualities as instantiated” (2000, 166; italics original). (See also Byrne and Hilbert 2003, 59.) This common worry might be developed into an argument for Realist Primitivism over Eliminativism. The argument may be divided into two premises. The first premise states that there must be some reductive explanation of how our experiences represent primitive colors – a “psychosemantics”. The second premise states that the true reductive psychosemantics will require that primitive colors are instantiated at some point in our evolutionary history. For instance, on the

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<sup>18</sup> Chalmers (2006, 92) is an Eliminativist who provides a different type of Conciliatory Semantics. On his semantics, by contrast to the semantics in the text, a color singular term such as ‘yellow’ does *not* denote the primitive color property that determines the phenomenal character of experiences of yellow by figuring in their intentional contents. Instead, it denotes a reflectance property that does not contribute to the phenomenal character of any color experience; and ‘lemons are yellow’ is true iff lemons have this reflectance property. Since lemons have the relevant reflectance property, ‘lemons are yellow’ comes out true. On his view, there is no name in English for the primitive (and uninstantiated) color property that figures in the contents of our experiences – it is completely ignored by language. It seems to me that the Conciliatory Semantics described in the text is superior to Chalmers’s semantics because, unlike Chalmers’s semantics, it accommodates the intuition that color names refer to properties that figure in the contents of our experiences and configure their characters. Still, as noted in the text, I reject any Conciliatory Semantics as unmotivated and counterintuitive.

Simple Causal Theory, an individual has an experience of primitive red iff he is in a sensory state that is caused by the primitive redness of physical objects under normal conditions. This requires Realist Primitivism.

I have stated the first premise in a rough way that entails the existence of primitive color properties – something which the Strong Eliminativist would deny. A better formulation is as follows: there must be some reductive account of how we “sensorily entertain” propositions according to which things are colored. This might be true even if Strong Eliminativism is correct, and the relevant propositions do not have primitive colors as constituents. Nevertheless, I shall continue to work with the rough formulation.

The first thing to notice about this argument is that the Response-Dependent Primitivist cannot accept it. Its second premise asserts that the instantiation of primitive colors by objects is primary, and that what primitive colors we represent is somehow explained in terms of the primitive colors of objects. The Response-Dependent Primitivism cannot accept this because he takes the reverse view. For him, the representation of primitive colors in experience is primary; and the instantiation of primitive colors by external objects is determined by facts concerning the representation of colors in experience. Therefore, the Response-Dependent Primitivist, like the Eliminativist, must provide an account of the representation of primitive colors that does not appeal to their prior instantiation by external objects. Response-Dependent Primitivism and Eliminativism are on a par as regards the psychosemantic issue.

The Psychosemantic Argument, then, can only be endorsed by the Response-Independent Primitivist. But, even as put forward by the Response-Independent Primitivist, the Psychosemantic Argument is unsuccessful. There are no arguments for either of its two premises; and there are arguments against them both. Consider its first premise: that there is some reductive theory of the representation of primitive colors. What is the argument for that? Maybe the argument is that there must be a reductive theory of *everything*. But remember: we are assuming Primitivism. We are considering the question of whether, once we accept Primitivism about color, there is any argument for accepting Realist Primitivism over Eliminativism. Once we accept that color is irre-

ducible, it is hard to see what argument we might have for thinking that the representation of color is any different.

Further, there is an argument against the claim that there is a reductive theory of the representation of primitive colors: no one has even come close to specifying a correct reductive theory. Theories of representation divide into two categories: pure input-based (e. g. Tye 2000) and theories with output-based elements (e. g. Lewis 1983, note 2). In my view, pure input-based theories fail. For instance, as we have seen (§2), the case of Bargle and Argle shows that the Simple Causal Theory fails. Even if Bargle and Argle are in states that are caused by the same primitive color under normal conditions, they have experiences as of different primitive colors. I believe that the case also refutes more sophisticated input-based theories, which appeal to a teleological notion of normality rather than a statistical one. For Bargle and Argle are equivalent in all relevant respects. Indeed, the case against input-based theories is overdetermined. The failure of input-based theories is also shown by standard variation in color vision, the distance problem, normal misperception, and so on. Output-based theories, in my view, fail as well. Of course, I cannot here provide arguments against all the theories. But the track-record of failure makes skepticism rational.

Let us suppose, then, that reductionism about intentionality fails. Intentional facts cannot be reduced to other facts. The intentional relation we bear to colors (or propositions about the colors) is a primitive relation. Primitivism is the right view of the representation of colors as well as of colors themselves. Then the Psychosemantic Argument fails, for the Eliminativist may tell exactly the same story as the Realist Primitivist. The Realist Primitivist will tell something like the following story. Bargle and Argle view an object  $f$  with a certain primitive color. As a result, Bargle bears a primitive intentional relation to primitive red and Argle bears the same relation to primitive brown. (More accurately, they bear the relevant primitive intentional relation to different highly detailed propositions into which specific shades of these colors enter as constituents.) Bargle's bearing the primitive intentional relation to primitive red supervenes on his being in a certain extremely complicated physical-functional state  $F$ . Argle's bearing it to primitive brown supervenes on his being in a different extremely complicated physical-functional state  $G$ . Why does being in a certain physical-functional state necessitate bearing the primitive intentional relation to one prim-

itive color rather than another? If Reductionism about sensory intentionality fails, no explanation is possible. Of course, there is no reason why the Eliminativist cannot tell a similar story. He may say that the experience of primitive colors supervenes on our being in certain physical-functional states, and that this supervenience cannot be further explained. Thus, if reductionism about intentionality fails, Realist Primitivism and Eliminativism are on a par with regard to “explaining color experience”.

Now consider the second, crucial premise. The second premise goes beyond the first premise in conjecturing that the true reductive theory will require that primitive colors have been instantiated at one point in our evolutionary history. Even if we grant reductionism about intentionality, this is dubious. What is the argument for it? Maybe the idea is that every promising theory of the representation of primitive colors we know of requires that they be instantiated at some point in our evolutionary history. But this is simply not true. True, input-based theories, such as the Simple Causal Theory, have this requirement. But they are false, as is shown by the case of Bargle and Argle and other problems. More promising, output-based theories of the representation of primitive colors are compatible with Eliminativism. For instance, according to Lewis’s *Interpretation Theory*, the right assignment of perceptual content is “the one given by the best general rule of assignment”, which is “the one that does best at assigning contents that rationalize behavior” (Lewis 1983, note 2). (Matthen 2005 also endorses an output-based theory of color content.) Owing to their different color processing, Bargle and Argle exhibit systematically different sorting and other color-related behaviors. It may be the assignment of <redness, being instantiated at *l*> to Bargle’s inner state and of <brownness, being instantiated at *l*> to Argle’s inner state are part of the best total rationalization of their different behavior. This might be so even if the object, *f*, instantiates neither color. The assignment of false contents can rationalize behavior just as well as true ones. So if this theory is right, then both the Realist Primitivist and the Eliminativist can provide a reductive account of how we represent primitive colors.

Indeed, there are arguments against the second premise. There are at least two reasons to think that, if there is a reductive account of the representation of primitive colors, it does not require that primitive colors are instantiated, so that the Eliminativist could accept it. The

first reason concerns Bargle and Argle. Suppose that Realist Primitivism is correct. Even though they are in states that are normally caused by the primitive brown color of the object, Bargle and Argle visually represent different primitive colors. Therefore, one might think that, if there is a reductive explanation of their representing different primitive colors, the brownness of the object they are viewing will not enter into it. Further, it is hard to see how the colors of *any* objects might enter into the explanation. But then the reductive explanation will be compatible with the complete non-instantiation of colors. Second, if there is a reductive theory of intentionality in general, then there is a reductive theory of the representation of abstract objects such as the *plus* function. But uninstantiated primitive colors and the *plus* function are in some respects akin: they are abstract objects, they are not “instantiated” by external objects, our internal states do not causally-covary with them, and so on. Therefore, one might think that, if there is a reductive theory of the representation of abstract objects in general, there is also a reductive theory of the representation of uninstantiated primitive colors.

I conclude that, once we accept Primitivism about color, there is no reason to think that color experience cannot have its amazingly detailed color content even if the world is entirely colorless.<sup>19</sup> Two further

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<sup>19</sup> Stroud (2000, chapter 4) raises an objection to the kind of Mackie-style Simplicity Argument for Eliminativism that I will endorse in the next section. Like the Psychosemantic Argument, it concerns the issue of whether there can be a satisfactory account of color experience in a colorless world. But it differs from the Psychosemantic Argument. First, he states that Eliminativism encourages a certain view of color perception (ibid., 87). Later he describes it as a non-intentional view which likens color perceptions to “raw feels” like pains (chapter 5). Second, he argues that this theory of experience is unsatisfactory because it could not satisfactorily explain the presence of color perceptions in the world (95). I think that the Eliminativist may reply to this argument by pointing out that Eliminativism does not require a non-intentional theory of experience; it is completely compatible with an intentional theory, as Stroud himself acknowledges (chapter 7). The Eliminativist who accepts Intentionalism still faces the Psychosemantic Argument; but I have suggested that this argument is unpersuasive.

Stroud (chapter 7) develops a distinct argument. The conclusion of the argument appears to be that the following situation is metaphysically impossible: a person (i) accepts Eliminativism, (ii) has color concepts (and so has the capacity to recognize others as having beliefs about *colors*), and (iii) has consistent beliefs about the colors. Stroud thinks that this situation is not possible because he thinks that having color concepts requires having beliefs about the colors of things. As Stroud acknowledges (193), this is not really an argument against Eliminativism and a vindication of Realism; it shows that Eliminativism cannot be consistently accepted, not that it is false. I have little to say about Stroud’s argument that has not already been said (Boghossian 2002, Byrne 2002, Johnston 2004). Since the above situation does seem to be metaphysically possible, we have reason in advance to be sceptical of any philosophical

points deserve mention. First, one might have the vague worry that the Intentionalist who is an Eliminativist cannot explain the extremely vivid impression we have in experience of being presented with objects having colors - what Pryor calls the “phenomenal force” of visual perception (20001, note 37). This worry is misguided. Owing to illusion and hallucination, all Intentionalists admit that “sensorily entertaining” false propositions about our environment can give us the vivid impression of being aware of extended objects possessing colors. The Eliminativist who is also an Intentionalist may say that all experience is like illusion and hallucination in this regard. Second, this is not “indirect realism”. Of course, the Intentionalist who is an Eliminativist does not say that we perceive physical objects by perceiving propositions. Nor need he say that we perceive physical objects by perceiving uninstantiated color properties. In my view, the idea that we *see* properties (non-extended items of a certain kind) is something which no Intentionalist should accept. Rather, the Intentionalist who is an Eliminativist holds that we perceive objects directly, but we regularly perceive them as other than they are.

## **12. The Simplicity Argument for Eliminativism**

The Moorean Argument, the Perceptual Argument and the Psychosemantic Argument fail. Nor can I think of any other arguments for accepting Realism over Eliminativism once we have acknowledged the irreducibility of color. At the very least, this shows that a skeptical position with regard to Realism is appropriate. Philosophers who acknowledge the irreducibility of color but continue to accept Realism have an unjustifiable view. One might think that the judicious choice is to remain neutral between Realist Primitivism and Eliminativism. Against this, there is an obvious reason for accepting Eliminativism over Realist Primitivism.

Philosophical positions are to be judged by how well their benefits trade off against their costs. I assume that simplicity is a benefit that should be considered in evaluating the plausibility of a hypothesis. It is common practice to invoke this benefit in deciding matters of ontolo-

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argument whose conclusion is that it is not possible. And there is a plausible account of how such a situation might arise: an Eliminativist might acquire concepts of the colors from color experience without believing that objects are colored (Boghossian 2002, 236-37). This is especially plausible if an intentional account of color perception is correct (Byrne 2002, 218-19).

gy. (For instance, philosophers have invoked simplicity considerations to argue for mereological nihilism.) I do not put forward any formal principle. In my view, a formal principle is not required. The proof of this is that we do in fact arrive at reasonable conclusions without one. Evidently, Realist Primitivism is ontologically inflationary. It requires a kind of Dualism at the surfaces of objects. Eliminativism avoids such a Dualism. It has the virtue of simplicity. This provides a strong reason to accept Eliminativism over Realist Primitivism. And, as I have been at pains to argue, there are no countervailing reasons to accept Realist Primitivism to Eliminativism.

Consider, for instance, Campbell's Response-Independent Primitivism. It would be a mistake to compare this view to Non-Reductive Physicalism about the mind. Non-Reductive Physicalists deny that experiences are first-order physical states, but they typically identify them with functional states. By contrast, the Response-Independent Primitivist endorses no informative identity statements concerning colors. In this regard, his view is like Property Dualism. Furthermore, on one elaboration, it postulates, for every minimal shade *C*, a brute necessity of the form 'Necessarily, *x* has *C* iff *x* has *R*', which asserts a strictly necessary connection between the reflectance property *R* and the wholly distinct primitive color *C*. There is no more basic, general necessary truth relating primitive colors and reflectances from which each of these necessary truths may be derived. Each is a kind of surd modal truth. So, for instance, there is no answer to the question, "Why does reflectance property *R* necessitate true blue<sub>4</sub> and not some other primitive color?" Smart (1956) complained against Dualism that it requires nomological danglers: laws of emergence that cannot be derived from the fundamental laws of physics. Likewise, we may complain against Campbell's Response-Independent Primitivism that it requires modal danglers: necessary truths connecting primitive colors with physical properties that cannot be derived from the necessities of logic, set theory, mereology, analysis, or any of the other necessary truths recognized by philosophers. Of course, the Reductionist about color who identifies colors with physical properties avoids modal danglers: for him, the relevant necessary truths follow from identities.

The Eliminativist, too, avoids postulating a swarm of modal danglers at the surfaces of objects. The Strong Eliminativist avoids such modal danglers by denying the existence of primitive colors altogether.

The Weak Eliminativist avoids them by claim that colors live only in the content of color experience and thought. This provides a strong reason for accepting Eliminativism over Response-Independent Primitivism. And there are no countervailing reasons to accept Response-Independent Primitivism. The Moorean Argument, the Perceptual Argument and the Psychosemantic Argument fail. In short, Response-Independent Primitivism and Eliminativism are on a par, but for the fact that Eliminativism is vastly simpler. Therefore it is more reasonable to accept Eliminativism than it is to accept Response-Independent Primitivism.

Now compare the Liberal Version of Response-Dependence Primitivism with Eliminativism. This view requires one modal dangler: for every primitive color  $C$  and surface  $x$ ,  $x$  instantiates primitive  $C$  iff  $x$  is disposed to normally produce experience of primitive  $C$  in *some creature or other* – not necessarily humans. The Liberal Version violates Exclusion. Indeed, owing to standard variation, it entails that every object actually instantiates a wide range of non-relational color properties. For this reason, I maintain that this view can be ruled out apriori.

But even if one thinks that the Liberal Version cannot be ruled out apriori, Eliminativism is to be preferred to it. The Liberal Version is complicated. It postulates a strange necessary connection between sensory dispositions and primitive colors. Eliminativism avoids this complexity. On this view, objects have sensory dispositions, but not supervenient primitive colors. Further, there are no sufficiently strong reasons to accept the additional complexity of the Liberal View. The Moorean Argument, the Perceptual Argument and the Psychosemantic Argument fail.<sup>20</sup>

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<sup>20</sup> So far, I have developed the Simplicity Argument against Campbell's Response-Independent Primitivism and McGinn's Response-Dependent Primitivism. But there is another argument: the "Intuitive Argument". Intuition counts against the claim of Campbell that there are strictly necessary connections between physical properties of objects and wholly distinct primitive color properties. Likewise intuition counts against McGinn's view. Suppose that a new type of creatures comes into being on Mars, and that as a result an apple here on earth acquires the disposition to produce experiences of orange in such creatures if placed before them. How could it be metaphysically necessary that this change results in the acquisition by the apple of the monadic, non-relational property *orange*? Since there is no reason to accept such views, we have no reason to doubt these intuitions. Nevertheless, in my view, the Simplicity Argument is the more fundamental argument. We may imagine versions of Response-Independent and Response-Dependent Primitivism that hold that the relevant modal connections are only nomologically necessary, thereby replacing modal dangles with nomological dangles. (For a discussion of a response-independent version of this view, see Byrne and Hilbert forthcoming.) These views avoid the Intuitive Argument: for all we know

Finally, consider the Chauvinistic Version of Response-Dependent Primitivism. The Chauvinistic Version ties the instantiation of primitive colors to one privileged species to the exclusion of all others. In my view, the extreme arbitrariness of this view means that it may be immediately ruled out *a priori*. In any case, this view has no advantages over Eliminativism. Depending on how the Chauvinistic Version handles standard variation, it entails that objects can have indefinitely many colors, or that they have almost no colors, or that we cannot be said to know their colors. But Eliminativism has an obvious advantage over the Chauvinistic Version: it avoids the needless postulation of a bizarre tie between the instantiation of primitive colors and one privileged species. Again, the choice is clear.

In effect, this is a version of Mackie's (1976) simplicity argument for Eliminativism. But I have answered an objection that Mackie did not consider. Imagine we discovered that our ordinary beliefs about physical objects require a dualism of things and their material constituents. Or suppose we discovered that Primitivism about consciousness is correct. In these cases, one might say, it would be preposterous to accept Eliminativism on the basis of simplicity considerations. There are countervailing reasons to accept Realism about ordinary objects or consciousness even if it is ontological inflationary. It may be suggested that the same is true in the case of color. But I have argued that in the case of color there is a crucial difference. Once we acknowledge the irreducibility of color, warrant for accepting Realism over Eliminativism is unobtainable.

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*a priori*, there might be strange laws of nature linking the physical or dispositional properties of objects with primitive colors. But they are still vulnerable to the Simplicity Argument. Indeed, all of the points I have made in this paper apply equally to the "nomologically necessary" versions of Campbell and McGinn's views.

McGinn suggests that his view is invulnerable to the Simplicity Argument on the grounds that "without the existence of color properties, objects could not even possess dispositions to produce color experiences since color properties figure – qua represented – in the very specification of such sensations" (1996, 550-51). McGinn is right: necessarily, if an object is disposed to produce experiences which represent that object as red, and if representing red involves being related to the property *red*, then the property exists. This is not a modal dangler because it is an application Existential Generalization. But I think this is irrelevant. McGinn does not only assert a connection between the sensory disposition and the *existence* of primitive redness. He asserts a connection between the sensory disposition and the *instantiation* of primitive redness: necessarily, if an object has the sensory disposition, then the object *instantiates* primitive red. This cannot be derived from Existential Generalization. It is a modal dangler.

### 13. Conclusion

Some species see the world in color. Owing to the different selection pressures operating on their ancestors, different species ostensibly perceive the same objects as having different colors. But, once we accept the irreducibility of colors, the best view is that the objects have none of those colors. The traditional Galilean view of color is superior to all the forms of Realist Primitivism. The best view is that the manifest image of the world is an illusion.

Now one might say that, in spite of all that I have said, it is impossible to accept Eliminativism. Maybe we can believe it from the armchair. But, as soon as we open our eyes, we cannot help but believe that objects are colored. I disagree. For instance, when I look at a range of fruits presenting striking colors, and I keep firmly in mind that they present different striking colors to different creatures, I can get myself to believe that this is not how things are, but rather a highly embellished version of how things are. But even if the point is granted, it is no objection. It may be rational to accept a view which, at least with our eyes open, we cannot accept.

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