

Colour

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(Final version in Philosophy Compass)

Abstract

The view that physical objects do not, in fact, possess colour properties is certainly the dominant position amongst scientists working on colour vision. It is also a reasonably popular view amongst philosophers. However, the recent philosophical debate about the metaphysical status of colour properties seems to have taken a more realist turn. In this article, I review the main philosophical views – eliminativism, physicalism, dispositionalism and primitivism – and describe the problems they face. I also examine how these views have been classified and suggest that there may be less disparity between some of these positions than previously thought.

1. Introduction

It certainly seems to us that we inhabit a world full of coloured objects – we see grass as green, the sky as blue and ripe tomatoes as red. However, this common-sense view has been challenged by scientists and philosophers, at least since the 17th century, when Galileo said:

I think that tastes, odors, colors, and so on are no more than mere names so far as the object in which we place them is concerned, and that they reside only in the consciousness. Hence if the living creature were removed, all these qualities would be wiped away and annihilated. (1957 (1623): 274)

Descartes, Newton, Boyle, Young, Maxwell and Helmholtz all agreed: it is a mistake to think that the objects around us have colour properties. This view is called eliminativism, and it has remained the dominant position amongst scientists working on colour vision. (Palmer 1999; Zeki 1983; Land 1983; Kuehni 1997; Cosmides and Tooby 1995) Eliminativists are motivated by the idea that our

common-sense view of colour cannot be accommodated within our scientific world view. Philosophers who defend this position include Averill (2005), Boghossian and Velleman (1989/1997), Hardin (1988), Mackie (1976), Maund (1995), Pautz (2006) and Strawson (1989).¹

2. Our Common-Sense Conception of Colour

Malebranche's characterisation of Augustine's view of colour goes some way towards capturing our common-sense conception: colour is defined as 'a quality that is spread out on the surface of bodies'. (Malebranche c.1680-90: 6.68) More recently, the phrase 'colour-as-we-see-it' has been proposed as a way of describing our common-sense conception of colour (Mackie 1976). This is an intuitive idea but difficult to describe in a sufficiently comprehensive way.² So, let me try and make it more precise. The following ideas seem to be involved:

- (1) Colours are properties that are experienced by conscious beings visually – they cannot be fully appreciated in any non-visual way: 'colours are visibilia or they are nothing' (Strawson 2011: 56).
- (2) Colours are objective properties that objects possess regardless of their being observed. In other words, they are mind-independent properties.
- (3) At least in standard cases, the colour of an object is causally involved in our seeing that object as having the relevant colour property.
- (4) We can know the intrinsic nature of colours just by looking at them and experiencing them. Mark Johnston calls this 'Revelation' (Johnston 1992/1997).³
- (5) Colour properties demonstrate what Adam Pautz has called 'exclusion' (Pautz 2006). In other words, if an object is, say, unique green all over, it cannot be unique red all over at the same time.⁴

3. Versions of Eliminativism

According to the eliminativist, we discover what kinds of properties objects do (or do not) possess through scientific investigation – and scientific investigation has revealed that objects do not possess properties that meet the criteria above. In other words, physical objects do not possess colour properties understood according to our common-sense conception. The properties of objects that are causally involved in colour vision are those properties that determine the specific wavelengths of light that reach our eyes.⁵ (See Hardin 1988 and Byrne and Hilbert 1997b for an introduction to the science of colour vision.)

Of course, eliminativists do not deny the existence of colour experiences; they are only eliminativists about colours as properties of physical objects. Many hold colour to be a mental property of some description:

Far from being a physical property of objects, color is a mental property – a useful invention that specialized circuitry computes in our minds and then “projects

onto” our percepts of physically colorless objects. This invention allows us to identify and interact with objects and the world far more richly than we otherwise could. That objects seem to be colored is an invention of natural selection, which built into some species, including our own, the specialized neural circuitry involved. (Cosmides and Tooby 1995: xi)

Barry Maund defines colour properties as qualitative properties, or ‘qualia’. These properties are subjective, intrinsic features of experiences although the subject does not take them to be features of the experiences. Instead, they are taken to be properties of physical objects: we project colours onto physical objects. (Maund 2011) A similar view has been argued for by Paul Boghossian and J. David Velleman (1989/1997) who take colours to be intrinsic properties of a ‘visual field’, which are projected onto external objects. Galen Strawson defines colour-as-we-see-it as a ‘phenomenological property of experience’ (forthcoming). He says ‘colour properties are essentially phenomenal properties, i.e. properties whose whole and essential nature can be fully revealed in sensory experience given only the qualitative (experiential) character that that experience has’ (Strawson 2008: 96).

In denying that colours are properties of objects, these philosophers have (in Shoemaker’s words) ‘kicked them upstairs into the mind’ (Shoemaker 2003). However, it is possible to deny that colours are properties of physical objects without locating them in the mind. J. L. Mackie and Adam Pautz regard colour properties as intentional, or abstract, objects (Mackie 1976; Pautz 2006). Pautz claims that colour properties do exist, but nothing instantiates them – they are always uninstantiated:

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. (2006: 39)

The main reason philosophers object to eliminativism seems to be that it convicts ordinary perception of a radical error: our experience of a world of coloured objects turns out to be some kind of illusion. Of course, it is unlikely that eliminativists will be swayed by this objection; they are motivated by scientific evidence and readily accept that our common-sense, intuitive view must be rejected.

However, it seems to me that there is a stronger criticism we can make of the versions of eliminativism we have considered. Remember, the motivation behind eliminativism is that colour properties (understood according to our common-sense conception) are not scientifically respectable. We do not need to appeal to such properties to explain colour vision, and we should only posit properties that science can accommodate. It therefore seems somewhat counterproductive to conclude from the scientific rejection of colour properties as properties of objects that colours are experiential/ qualitative/ phenomenological properties, or intentional/ abstract objects – for it is arguable that such things fall outside the remit of our best science

in the same way that colours as properties of objects fall outside this remit.⁶ Of course, this is not a decisive objection; we may think that the properties posited by eliminativists are required to explain colour experiences once colours have been banished from the surfaces of objects, notwithstanding their dubious metaphysical credentials.

A further point to note – since the eliminativist philosophers discussed so far do not in fact eliminate colour properties tout court, they merely eliminate colours qua properties of physical objects, we may think that the name ‘eliminativism’ is rather misleading.⁷ Eliminativists seem to be in the business of relocating colour properties rather than eliminating them. With this in mind, there is one last eliminativist view I will consider that we might think of as ‘strong eliminativism’ – this is the view that colour properties do not exist at all: they are not mental properties, and they are not intentional or abstract objects.

Strong eliminativists deny that we need to posit colour properties in order to explain colour experiences. Consider this quotation from Larry Hardin’s well-known defence of eliminativism:

Colored objects are illusions, but not unfounded illusions. We are normally in chromatic perceptual states, and these are neural states... [W]e are to be eliminativists with respect to color as a property of objects, but reductivists with respect to color experiences (1988: 111–112).

Hardin’s use of empirical data from scientific studies into how colour experiences are realised by neural processes makes room for an ontological reduction of colour experiences, without requiring that colour properties be properties of those neural processes or, indeed, properties of anything at all.⁸

Even though eliminativism is still the dominant position amongst contemporary scientists working on colour vision, many philosophers have reacted against the view and have attempted to get colour properties back into the world. There are three main realist views: physicalism, dispositionalism and primitivism.

4. Physicalism

According to the physicalist, colours are objective, physical properties of objects – surface reflectances, for example⁹ (Armstrong 1987; Byrne and Hilbert 2003; Jackson 1996; McLaughlin 2003; Tye 2000). (An object’s reflectance property is the proportion of light that it reflects at each wavelength in the visible spectrum.) If experienced colour shades correlated well with particular surface reflectance properties, then physicalism would be a reasonably attractive position. Unfortunately, this is not the case – the existence of metamers quickly presents a challenge to the physicalist view. Metamers are two or more different surface reflectance properties that appear to us to be exactly the same colour in some conditions. As a response to the metamer challenge, physicalists have claimed that

a specific colour shade is a disjunction of surface reflectances (Smart 1997), a type of surface reflectance (Byrne and Hilbert 1997a) or a higher-order property of having one or another surface reflectance property (Tye personal communication). But this is already a rather undesirable complication to the physicalist's account.¹⁰

This problem is exacerbated by the fact that there seems to be no perceiver-independent way of specifying the disjunction of surface reflectance properties to which a particular colour shade is to be reduced. The different surface reflectance properties involved bear no intrinsic resemblance to each other; they form a disjunction simply because of the colour experiences they cause in perceivers. Although this doesn't make colours mind-dependent properties, they are certainly anthropocentric properties on this account. This leads to another worry: we tend to think that colours stand in certain similarity relations to each other (blue is more similar to purple than it is to yellow, for example) and yet the anthropocentrically defined disjunctive properties provided by the physicalist do not seem able to preserve this claim. (See Maund 2011. See Byrne and Hilbert 1997a for a response. Also, see Davies forthcoming.)

Additional worries arise when we consider some interesting scientific facts about colour perception. For example, a particular surface will look to be different colours to us depending upon the lighting conditions and its surroundings. The same Munsell colour chip¹¹ will appear to be lighter when placed on a black background and darker when placed on a white background. The same chip will also appear to be different shades depending upon the colours surrounding it. (See Hardin 1988 for examples of these kinds.) Alex Byrne and David Hilbert (2004) and Michael Tye (2000) defend colour physicalism from this objection. They claim that these simultaneous contrast effects are illusions and cannot be used to show that objects do not have objective, mind-independent colours. After all, we do not conclude from the Müller-Lyer illusion that length is not an objective, intrinsic property of the line, and we should not conclude from contrast effects that colour is not an objective, intrinsic property of the chip. However, there is an important difference between the two cases: we have independent methods of measuring the two Müller-Lyer lines, yet we have no independent way of establishing the 'real' colour of a particular colour chip. We seem to have no way of identifying which surrounding allows us to see the colour as it 'really is'.¹²

A similar problem is generated by thinking about the visual systems of other species. Human beings are trichromats (we have three types of retinal cone cell) whereas most other mammals are dichromats, and some birds and insects are tetrachromats. It is reasonable to assume that the colour experiences we human beings enjoy when perceptually related to a particular object will be very different from those enjoyed by birds, and by other mammals. According to the physicalist, having one or another surface reflectance property just is what it is for an object to be a particular colour, so if two species are looking at the same object but have different colour experiences, then one species has to be wrong. Of course, the physicalist can simply stipulate that one or another of the species gets the colour

wrong (Tye 2000). But this seems to miss the point of the objection. Given the fact that we are all equally products of the process of evolution by natural selection, it would be unashamedly anthropocentric to think that we alone get the colours of objects right. Moreover, given the variety of animal visual systems, it seems very unlikely, statistically, that we are the lucky species. (See Shoemaker 1994, 2000; Tye 2000; Bradley and Tye 2001; Byrne and Hilbert 2004 for further discussion.)

It is not only interspecies variation that presents a challenge for the colour physicalist. The same surface reflectance can appear to be different colours to different people. What seems unique blue to John can seem greenish-blue to Jane.¹³ This problem has generated a series of exchanges between physicalist philosophers offering solutions to this puzzle and criticisms of these solutions (see Tye 2006a, 2006b, 2007; Byrne and Hilbert 2007; Cohen et al. 2006).

Physicalists encounter many of the problems we have looked at in virtue of defending two of our common-sense criteria – the idea that colours are objective features of properties, and exclusion: the idea that an object can only ‘really be’ one colour (all over, at a time). Despite this attempt to preserve certain features of our common-sense account, the physicalist’s analysis of colours as anthropocentrically defined disjunctions of surface reflectance properties (in ideal lighting and surround conditions) seems a far remove from our common-sense conception of colour.

5. Dispositionalism

Dispositionalism originated with the secondary-quality view advocated by Locke, who said:

Such qualities, which in truth are nothing in the Objects themselves, but Powers to produce various Sensations in us by their primary qualities, that is, by the Bulk, Figure, Texture, and Motion of their insensible parts, as Colours, Sounds, Tastes, and so forth. These I call secondary qualities. (Locke 1689: II, VIII, §10)

Dispositionalists hold that colours are (to simplify) dispositions to cause certain kinds of experiences in perceivers (Peacocke 1997; Johnston (with reservations) 1997; Levin 2000; McGinn 1983). The claim is often expressed in terms of standard perceivers in standard conditions. This allows dispositionalists to uphold ‘exclusion’ since a particular surface will only ‘really’ have one colour (all over, at a time). If to standard perceivers in standard conditions an object is disposed to look red, then the object is ‘really’ red (even if it looks to be other colours in other situations or to non-standard perceivers). However, specifying who is to qualify as a standard perceiver and which conditions count as standard proves to be a difficult task.

We saw in our discussion of physicalism that we have good reasons for thinking that different species have different colour experiences when viewing the same object, and there seems to be no legitimate way of deciding which species sees the

colours objects really have. Our decision over which conditions count as standard looks to be equally arbitrary – should we choose direct sunlight or shade? Should we choose morning, midday or afternoon light?¹⁴ (See Hardin 1988, 2003 for discussion.) Dispositionalists can modify their account so that an object is red if it is disposed to look red to certain kinds of perceiver in a particular situation. This is to abandon exclusion and embrace colour pluralism – the same object will have dispositions to look a number of different colours depending on the perceiver and the viewing conditions. (See Kalderon 2007 and Matthen 1999. I will consider problems with colour pluralism in Section six.)

Jonathan Cohen's relationalist view offers an extreme solution to the problem of specifying standard perceivers and conditions. He claims that colours are relational properties; an object is 'green for subject S in condition C1' and so on. (See Cohen 2009 for a detailed defence of this account. And see Averill 1992 for another relationalist account.) I mention this view here because Cohen claims that dispositionalism is a version of relationalism (Cohen 2010). In fact, these positions are quite different. It is true that dispositions are specified relationally – colours are specified with reference to perceivers – but dispositions are not ordinarily thought of as metaphysically relational properties. For example, we tend to think that a sugar cube would be soluble even if there was no water and so no way for the sugar to manifest this disposition. This is not a purely terminological point; if we think that dispositions are relational properties, then we will classify dispositionalism as a subjectivist account (see Maund 2012 and McGinn 1996). If we think they are non-relational, then dispositionalism will be an objectivist account. And, of course, it is only if the second option is taken that colours will qualify as objective properties of objects on this view.

According to the dispositionalist, an object is red if it is disposed to look red to standard perceivers in standard conditions. This seems straightforwardly circular, although philosophers disagree over whether or not the circularity is vicious. (See McGinn 1996, Boghossian and Velleman 1989/1997 and Byrne and Hilbert 2011.) Christopher Peacocke takes the criticism seriously and introduces the term 'red*' (a sensational property of the visual field) to replace the term red on the right hand side of the biconditional. (Peacocke 1984/1997) Boghossian and Velleman argue that Peacocke's account is phenomenologically inadequate since the property red* is not attributed to objects on his model, and yet the phenomenology of colour perception is naively realistic. Indeed, the general claim that colour properties are dispositional properties has been criticised for being incompatible with the phenomenology of our colour experiences. After all, colours don't seem to be dispositional properties. (See Cohen 2010 for a response to phenomenology-based objections on behalf of the dispositionalist.)

A related difficulty concerns whether it makes sense to say that we can see dispositions; after all, colours are supposed to be visible. If we cannot see dispositions, and colours are dispositions, then we cannot see colours (McGinn 1996). Cohen concedes there may be a problem with the idea of seeing dispositional

properties in general, but because the dispositions involved in the colour case have visual experiences as their manifestations, the problem is surmounted (Cohen 2010). He claims that this is in the spirit of John McDowell's response:

What would one expect it to be like to experience something's being such as to look red, if not to experience the thing in question (in the right circumstances) as looking, precisely, red? (McDowell 1985: 112).

A further worry arises if seeing involves a causal relation to what is seen, for it seems the causal relation will be between the perceiver and the categorical base of the dispositional property. If this is true, it would mean that colours are not causally involved in our seeing objects as coloured.¹⁵ Identifying colours with the categorical base itself would be to abandon dispositionalism in favour of physicalism or primitivism.

Like physicalism, dispositionalism provides us with an account of colour properties which is quite unlike our common-sense conception. As such, I think a case can be made for the idea that physicalism and dispositionalism may not, strictly speaking, qualify as realist positions. After all, when we ask whether colour properties really exist, we want to find out whether Augustinian colours, or colours-as-we-see-them exist; that is, we want to find out whether there are properties that satisfy our ordinary conception of colour properties. And on this issue, the physicalist and dispositionalist can agree with the eliminativist: colours-as-we-see-them do not exist. What does exist (according to these views) is either an anthropocentrically demarcated disjunction of surface reflectance properties or a disposition to cause certain experiences in rather specific kinds of perceivers in very particular situations.¹⁶

It is telling that an eliminativist, who denies that physical objects possess colour properties, could agree that they possess the kinds of properties picked out by these so-called realist views. This suggests that the dispute between eliminativism and these forms of realism is terminological: the disagreement is over which kinds of properties get to be called 'colours'. Indeed, Locke, who is considered to be one of the first dispositionalists, is quite explicit about being an eliminativist about colours-as-we-see-them and a dispositionalist when it comes to explaining the causes of our colour experiences. (See Mackie 1976 for discussion.) The only account which endorses realism with respect to colours-as-we-see-them is primitivism.

6. Primitivism

On this view, colours are simple, non-relational, non-reducible, non-physical, qualitative properties of objects (Campbell 1993/1997; Gert 2008; McGinn 1996, 2000). Campbell calls his primitivist position the 'Simple View' since he believes it represents our common-sense conception of colour. Indeed, primitivists tend to

assume that their view should be the default position in virtue of its compatibility with common – sense.

Now, eliminativists agree that primitivism captures our common-sense conception of colour properties; they simply deny that any such properties exist. According to our best scientific theories, the only properties that objects possess that are causally involved in our having the colour experiences we do are those properties that determine the specific wavelengths of light that reach our eyes. This fact generates the causal problem for primitivism. Specifically, we would have the colour experiences we have when in perceptual contact with objects regardless of whether these objects possess primitive colour properties in addition to their physical properties. (See Pautz 2006 and Chalmers 2006 for related, evolution-based arguments against primitivism.)

There are two possible moves for the primitivist to make in response to this challenge: either they can endorse causal overdetermination and claim that primitive colour properties are also part of the causal explanation for our colour experiences or they can retreat to epiphenomenalism.

Besides the well-known problems concerning the general plausibility of overdetermination, which I won't rehearse here, there are worries particular to primitivism that arise if the first option is taken. If the relevant physical properties and the primitive colour properties are independent, then it seems an object could possess whatever physical properties required to cause a red experience in subject S in circumstance C but also have the primitive colour property green. In such a case (if we accept causal overdetermination), the perceiver would have to perceive the object in question as being, simultaneously, both red and green.

Primitivists can say that colour properties supervene on the microphysical properties that scientists use in their causal explanation of colour vision. (See McGinn 1996 for another version of the supervenience thesis). Peter Hacker seems to hold this kind of view. He argues that colour properties can appear in causal explanations of colour vision even though another explanation can be given in purely physical terms. The two kinds of explanation can coexist without rivalry in the same way that explanations involving 'solidity' can coexist with explanations involving the microphysical supervenience base of solidity (Hacker 1987).

Unfortunately, this analogy does not hold. Although we may allow a duality at the level of explanation, we do not think that the property of solidity is ontologically distinct from microphysical structure – at the ontological level, we think that the solidity of an object just is its microphysical structure. Consequently, this is not a case of genuine causal overdetermination. Colour properties are, according to the primitivist, non-physical properties – they are ontologically distinct from the physical properties of the object. If they are to be causally responsible for our colour experiences, then this will involve a genuine (hence problematic) sense of overdetermination.

Epiphenomenalism seems a likely outcome. Of course, this is to accept that primitive colour properties are not causally involved with our seeing objects as

coloured. Consequently, if seeing is a causal process, then primitivists would have to say that we never actually see colours (Bradley and Tye 2001). Of course, the eliminativist also denies that we ever see colours, and I do not want to suggest that this is problematic in itself. However, primitivism claims to preserve our common-sense view of colour properties, and so, the idea that colour properties are not causally involved with our seeing objects as coloured is particularly damaging for the primitivist.

Like physicalists and dispositionalists, primitivists rely on the idea of ‘standard perceivers and standard conditions’ in the attempt to preserve ‘exclusion’: the claim that a particular surface can only ‘really’ be one colour (all over at a time). The fact that there seems to be no non-arbitrary way of doing this is therefore as much of a problem for primitivism as it is for the other realist views. Given the number of different visual systems that do in fact exist (across species) and the innumerable possible visual systems that could have evolved, there seems to be no justification in thinking that we ever see the colours that objects ‘really’ have. One option is to reject exclusion and embrace colour pluralism – the view that a particular surface can be different colours (all over at a time).

Adopting colour pluralism may seem to be a way of allowing that we do see the colours that objects really have; however, we immediately face the reverse problem – it is difficult to make sense of the idea that we ever get an object’s colour wrong. Given the number of different existing (and possible) visual systems, the pluralist will have to claim that every object instantiates every colour property (Pautz 2006). If this is the case, it seems that we can never see an object as having a colour property it does not, in fact, possess.¹⁷

Mark Kalderon claims that his pluralist account can accommodate the misperception of colour properties (in colour contrast effects at least) by appealing to the fact that there are more and less favourable situations for our particular visual systems (Kalderon 2007). However, this manoeuvre locates the error in an unusual place: if every object instantiates every primitive colour property, then the reason for our error is not (as we might be inclined to think) that the object is not really the colour we perceive it as being; instead, the error is due to the suboptimal working of our own visual system.

In any case, I think there is a more worrying consequence of the idea that every object instantiates every primitive colour property; namely, this entails that there are no colour differences between objects. It is true to say of every object that it is red, yellow, green and so on. If primitivists take the pluralist route, the view certainly loses its status as the common-sense account of colour properties.

7. Concluding Remarks

We have seen that whether a view counts as a realist view of colour properties depends on what concept of colour we are working with. If we ask whether there are properties that satisfy our common-sense conception, the eliminativist will

respond in the negative. However, it seems to me that the dispositionalist, the relationalist and the physicalist must also respond in the negative, since their accounts do not provide us with colour properties that qualify as ‘colours-as-we-see-them’. There is, therefore, some common ground amongst eliminativism and these views – and in this respect, they all stand together in opposition to primitivism.

On the other hand, there is some common ground between eliminativism and primitivism since both views agree that we should define colour properties as ‘colours-as-we-see-them’. On this point, eliminativism and primitivism stand together in opposition to the other (so-called) realist views that all give an alternative conceptualisation of what colour properties are and base their subsequent realism on the claim that these properties (dispositional properties, relational properties or disjunctions of surface reflectance properties) really do exist.

Another interesting point arises from this discussion. Eliminativism arose through a consideration of what science has to tell us about the kinds of properties we can correctly attribute to physical objects. Now, some philosophers may think that we should not let science dictate what properties are real (this seems to be an idea that motivates Hacker, for example). And yet, our discussion of primitivism suggests that the eliminativist’s appeal to science is unnecessary – there might indeed be scientifically motivated reasons for considering colour properties to be problematic, but the difficulty with locating colour in the external world arises within our common-sense framework itself.

If we return to the rough list of criteria we might think are integral to our concept of colour, this becomes apparent. It is part of our everyday experience that the very same object can appear to be quite different colours depending on the lighting conditions, even though there is no change to the intrinsic properties of the object. We know that we have no way of deciding which colour is the ‘real’ colour of the object in question and no clear conception of what would count as ‘normal conditions’, yet surprisingly, this does not prevent us from believing that the object really is a particular colour. Our objectivist attitude towards colour properties also seems to conflict with another feature of our everyday thinking about colour. Even as young children, we sometimes wonder whether different people have different colour experiences when looking at the same object, without wondering whether we (or other people) get the colours of objects wrong. If we were consistent objectivists, then we would interpret the idea that we may see colours differently from each other as entailing that some of us may see colours incorrectly.

It may sound implausible to claim that there are internal inconsistencies within our commonsense view of colour; after all, surely this would be obvious to us. And why did eliminativism only become popular after it was argued that there is a clash between common sense and science? These are interesting questions, and I can only offer a tentative response: we evolved colour experiences because they are incredibly useful for navigating the world, and since the internal inconsistencies we have identified do not prevent colour experiences from performing this function, they simply go unnoticed.

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¹ Kant also defends this position when he says: ‘colours are not properties of the bodies to the intuition of which they are attached, but only modifications of the sense of sight, which is affected in a certain manner by light’ (Kant 1781 (1921): A28).

² Galen Strawson suggests that ‘colour-as-we-see-it’ describes the concept of colour we possess before we do any science or philosophy (forthcoming).

³ For an earlier expression of this idea, see Russell’s (1912). Johnston quotes the following passage from Russell: ‘the particular shade of colour that I am seeing...may have many things to be said about it. ... But such statements, though they make me know truths about the colour, do not make me know the colour itself better than I did before: so far as concerns knowledge of the colour itself, as opposed to knowledge of truths about it, I know the colour perfectly and completely when I see it and no further knowledge of it itself is even theoretically possible’ (Russell 1912: 47).

⁴ See Johnston (1992/1997) for another set of criteria for identifying our everyday conception of colour properties.

⁵ It is not only to physical objects that we ascribe colour properties – we also see liquids, gases, films and light-emitting sources as possessing colour properties. However, our explanation for why we see these things as coloured will only appeal to the scientifically respectable physical properties that are responsible for the kinds of light that reach our eyes.

⁶ This objection cannot be avoided by claiming that experiential/qualitative/phenomenological properties are in fact identical to neural properties, since we do not want to say that our neural processes are red, yellow, blue and so on.

⁷ Perhaps ‘Augustinian colour eliminativism’ would be a more appropriate name.

⁸ Much of Hardin’s work seems to be in the spirit of the view I have called ‘strong eliminativism’. However, in his 1994, he uses the phrase: ‘the colors that we actually see’ (1994: 505), which suggests that he believes that colour properties do in fact exist. Exegetical issues aside, it seems to me that strong eliminativism is a promising view, worthy of further development. We can be realists about colour experiences – they are neural states/processes – whilst denying that colours are properties of anything at all. ⁹The colour properties of liquids, films, light-emitting sources and so on will need to be given a different reductive analysis.

¹⁰ The claim that colours are causally involved in our colour experiences becomes more difficult to uphold if colours are disjunctions of surface reflectance properties since it is unclear whether disjunctive properties have causal powers.

¹¹ The Munsell colour system is a system for classifying colours according to hue, value (lightness) and chroma (purity/ saturation). See www.munsell.com.

¹² See Hardin (2003) for a detailed analysis of the problems contrast effects cause for the physicalist account.

¹³ The idea that different people might enjoy different colour experiences whilst looking at the same object in the same conditions originated with Locke’s inverted spectrum thought-experiment. See Locke (1689/1975: II, xxxii, 15).

¹⁴ This is also a problem for the physicalist view.

¹⁵ As I mentioned in footnote 6, a similar problem may arise for the physicalist account. The causally relevant property in colour perception is the particular surface reflectance property of the object in question, not the disjunctive property of having a type of surface reflectance property. We may be sceptical about whether disjunctive properties can have causal powers at all.

¹⁶ It is sometimes difficult to establish whether a proposal for the reduction of a property deemed ontologically problematic is a genuine reduction or whether the analysis offered takes us so far away from our ordinary conception of the property in question that the reduction in fact constitutes an elimination. This is often an issue in philosophy of mind. For example, ‘qualia’ (qualitative properties) are sometimes defined in such a way that any physicalist view must be eliminativist about them (when qualia are defined as necessarily non-physical, for example). Even though

dispositionalists and physicalists present themselves as reductionists rather than eliminativists, I suggest that the conception of colour we end up with on these views is so far removed from our ordinary conception that they may be better classified as eliminativist.

¹⁷ Other realist views besides primitivism can endorse pluralism. See Jackson and Pargetter (1987/1997) for a physicalist account with pluralist sympathies.

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