

## Perspectival Truth and Color Primitivism

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### 0. Introduction

Perspectivalism is a semantic theory according to which the contents of utterances and mental states (perhaps of a particular kind) have a truth-value only relative to a particular perspective (or standard) determined by the context of the speaker, assessor, or bearer of the mental state. I have defended this view for epistemic terms, moral terms and predicates of personal taste elsewhere (Brogaard 2008a, 2008b, forthcoming a).

The main aim of this paper is to defend perspectivalism about color perception and color discourse. The content of color perception and color discourse, I will argue, has a truth-value only relative to an appropriate viewing condition and the perceiver, or a perceiver deferred to.

The paper's main argument runs as follows. Evidence indicates variation in the color experiences of perceivers exposed to the same color stimulus in the same viewing conditions. But the only theories that can accommodate this sort of variation are theories that take the colors to be properties which have extensions only relative to perceivers and viewing conditions or just are relations to perceivers and viewing conditions. To adjudicate among the views that can accommodate variation in color perception, I argue, we must consider how well these views fare on the plausible assumption that the content of color discourse contains or picks out color properties. The view that fares best in this regard, I argue, is a version of color primitivism, viz. the view that the colors are purely qualitative properties which are directly revealed in color perception and which objects possess relative to perceivers and viewing conditions. Given the hypotheses that the colors are properties possessed by objects only relative to perceivers and viewing conditions, and that the content of color discourse contains or picks out color properties, perspectivalism about color perception and color discourse inevitably ensues.

Before turning to the paper's main argument, I will address a number of semantic questions concerning perspectivalism, what perspectivalism is, whether it applies to every discourse (beyond those for color, moral, and epistemic terms), whether it entails pluralism about truth, what the contrast is between perspectivalism and relativism about truth-apt discourse, and so on. I will also briefly address the questions of what it means to say that perception has content and whether one can give a deflationary account of perceptual content.

In the appendix I will address some specific problems that arise for color primitivism, viz. the problems that it runs into permuted earth problems and requires us to posit what

David Chalmers calls 'strong necessities'. I will argue that primitivism avoids both of these problems.

### 1. Monadic Truth vs. Perspectival Truth

We often speak of specific discourses as perspectival or relativistic, for instance, discourse about taste or discourse about conditionals. So, the question naturally arises whether these sorts of views apply only to the specific discourses they are said to apply to or whether they apply more generally. The answer is not straightforward. There is a sense in which perspectivalism applies to every discourse. However, when a sentence does not contain a property that has an extension only relative to a centered world, the perspectival nature of truth is redundant.<sup>1</sup> For example, the sentence 'Brit (if she exists) is human' is true relative to a centered world in which Brit is marked but it is also true relative to a centered world in which John is marked. So which individual happens to occupy the center does not affect the truth-value of the sentence, and which world we are at does not affect it either.

Perspectivalism thus entails a version of pluralism about truth. Some discourses/propositional contents are genuinely perspectival, some not. And some discourses are more perspectival than others. For example, attributions of truth to propositional contents containing non-perspectival properties such as *being human (if one exists)* attribute one way of being true: a non-perspectival monadic truth-property. Attributions of truth to propositional contents containing world-relative properties such as *being a bachelor at time t* attribute another way of being true: a dyadic truth-property (truth relative to a world). And attributions of truth to propositional content about color or moral decency attribute yet another way of being true: a perspectival polyadic truth-property (e.g., truth relative to worlds, times, perceptual systems, and viewing conditions).

Elsewhere I have argued that pluralism about truth of propositional content does not entail pluralism about truth of truth-apt discourse (Brogaard 2008b). I still think that is partially right but only partially. When truth of content depends only on parameters of a context *c* one can define a monadic truth-predicate as follows: *S-in-c* is true simpliciter iff *S* expresses *p* relative to *c*, and *p* is true relative to *i*<sub>1</sub>, *i*<sub>2</sub>, ..., *i*<sub>*n*</sub>, where *S* is a sentence, *p* is a proposition, and *i*<sub>1</sub>, *i*<sub>2</sub>, ..., *i*<sub>*n*</sub> are contextual parameters of *c*. So, even if the proposition that theme parks are fun is true only relative to the standards of a speaker or assessor, the sentence 'theme parks are fun', taken relative to context, may be said to be true simpliciter.

However, in most cases of perspectival discourse, parameters beyond standard contextual parameters are required for propositional truth-assignment. For example, as we will see below, color discourse has truth-values only relative to perceptual systems and viewing conditions. Though perceptual systems and viewing conditions in some cases are parameters of the speaker's utterance circumstances, this is not in general the case, and perceptual systems and viewing conditions certainly are not features of the speaker's context of utterance, as 'context of utterance' is traditionally construed (as a sequence of a world, a speaker, a time, and a location).

Moreover, regardless of whether one's semantics contains a monadic truth-property that applies to sentences-in-contexts or a polyadic truth-property that applies to sentences in isolation, it is still going to be the case that there is more than one kind of truth-property: one that applies to sentences-in-contexts and one that applies to sentences in isolation. So, if perspectivalism is true for a given discourse but not for all discourses, pluralism about truth-apt discourse seems inevitable: Attributions of truth to truth-apt sentences containing only non-perspectival predicates like 'is human (if they exist)' or 'is prime' attribute a monadic non-perspectival truth-property, and attributions of truth to truth-apt sentences or

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<sup>1</sup> A centered world is here to be understood in the standard way as a world in which certain features are marked and required to determine the extension of the expressions in a given discourse.

sentences-in-context concerning colors or personal taste attribute a different kind of monadic truth-property, or a polyadic perspectival truth-property, for example, truth relative to a perceptual system.

As I will construe the terms here, semantic relativism is a species of semantic perspectivalism. Perspectivalism takes truth of a discourse fragment/type of content to be relative to whichever parameters are required in order to determine the extension of the discourse fragment/type of content. Relativism takes truth of a discourse fragment/type of content to be relative to whoever is assessing the discourse fragment/type of content for truth. So, perspectivalism is more all-encompassing than relativism. Relativism is simply a version of perspectivalism.

It is sometimes claimed that relativism is substantially different from perspectivalism in that the former but not the latter takes the extension of sentences-relative-to-a-context-of-utterance to depend on parameters of a context of assessment. I myself have made this claim in the past. However, I am now convinced that this difference has no ontological or semantic significance. If we define a context-simpliciter as a sequence of parameters some of which are features of the speaker's context and some of which are features of the assessor's context, we can either attribute a monadic truth-property to sentences taken relative to this sequence or attribute a polyadic truth-property to the sentence in isolation. Either way sentences containing perspectival/relative expressions do not have monadic truth-values apart from a sequence of parameters. So, perspectivalism/relativism and hence pluralism about truth is guaranteed (at least given the assumption that not all discourses are perspectival/relativistic).

What does make a difference to the semantics is whether propositional content varies relative to contextual parameters. If propositional content varies relative to contextual parameters, we have a form of indexical perspectivalism. If propositional content remains fixed relative to contextual parameters, we have a form of non-indexical perspectivalism.

Here I will defend a mixed version of perspectivalism where pure indexicals ('I', 'now', 'here') and true demonstratives ('this' and 'that') have contents (and extensions) that vary with contextual parameters but where color terms have extensions but not contents that vary with contextual parameters. When the content of a sentence varies with contextual parameters, the sentence does not express the same content relative to different sets of parameters. This is quite intuitively so for the case of pure indexicals and true demonstratives but less clearly so for the case of color terms.

It is sometimes thought that whether the truth-properties that apply to propositional content are monadic or polyadic partially depends on whether there are contextual parameters which are shiftable by modal operators (Kaplan 1989). If none are shiftable, then the only truth-properties that apply to propositional content are monadic. However, all contextual parameters are in principle shiftable by modal operators in some possible language. So, if the thought is correct, then to determine whether the truth-properties that apply to propositional content are monadic or polyadic we need to look at whether an operator is shiftable in the language expressing the content. The world parameter is shiftable in English. 'It is possible that there are blue swans' can be true even if 'there are blue swans' is false in the actual world. The speaker parameter as such does not seem shiftable in English. For example, 'John believes I am hungry' is never true in circumstances in which John believes he is hungry but I am full. So, 'John believes' does not shift the speaker parameter. However, 'John believes theme parks are fun' is sometimes true in circumstances in which John believes theme parks are fun by his standards. So, it is plausible that 'John believes' shifts a speaker- or assessor-standard parameter. So, it is plausible that these kinds of propositional contents are true only relative to a speaker- or assessor-standard parameter.

## 2. Truth, Veridicality, and Deflationary Perceptual Content

Part of the aim of this paper is to defend the claim that perceptual content is perspectival. For perceptual content to be perspectival, it must be truth-evaluable, and for it to be truth-evaluable, it must convey information about the world. But some may object to the assumption that perceptual experiences convey information about the world. Representationalists typically treat perceptual experiences as non-cognitive propositional attitudes with substantive, or non-deflationary, propositional contents (Russellian, Fregean or possible-worlds contents). But the assumption that perceptual experiences are non-cognitive propositional attitudes has been explicitly denied by numerous others. For example, direct realists hold that good perceptual experiences are relations to external objects. Accordingly, good perceptual experiences do not have substantive truth-evaluable contents. Sense-data theorists hold that perceptual experiences are relations to sense-data. Consequently, no perceptual experience has substantive truth-evaluable content. Adverbialists deny that experiences are relations to objects or properties. Perceiving R is engaging in the activity of perceiving R-wise. For example, one has an experience as of R being red just in case one is engaged in the activity of perceiving red-ly and R-wise. So, adverbialists too deny that perceptual experiences have substantive truth-evaluable contents. Raw feel theorists equate perceptual experience with mere sensation. So, perceptual experience has no intentionality, no object-directedness or externality, and hence no substantive truth-evaluable content.

However, the assumption that perceptual experiences have truth-evaluable contents is less despicable if we take a deflationary approach to perceptual content. We might equate the content of perceptual experiences with either their accuracy (or 'veridicality') conditions (see Siegel 2008, forthcoming) or the contents of the 'that'-clauses of accurate (first-person) phenomenal reports of the experience.

As for the first proposal: On a natural way of construing this proposal, experience *e* has the proposition *p* as a content iff necessarily, if *e* is accurate, then *p* is true (see Pautz 2008). As for the second proposal: On a natural way of construing this proposal, experience *e* has the proposition *p* as a content iff necessarily, 'in having *e* it visually seems to me that *p*' is an accurate (first-person) phenomenal report.

There may seem to be no interesting difference between the two ways of deflating perceptual content. However, there are some interesting differences. The first approach rules out views of perception that deny that perceptual experience has non-derivative accuracy conditions. The first approach also entails that every necessary proposition is the content of every experience (Pautz 2008). The first approach furthermore rules out the possibility of centered-worlds contents – contents that have a truth-value only relative to a centered world. One can possibly avoid this consequence by construing accuracy conditions as follows (Pautz 2008): Experience *e* has the centered proposition *p* as a content iff *p* is true at every centered world at which *e* is accurate. But this conception assumes that there is a way to understand 'perceptual accuracy at a centered world'. Since one aim of this paper is to defend just this claim, I cannot assume it up front.

The second approach is neutral on whether content is centered-worlds content or standard possible-worlds content, and it does not entail that every necessary proposition is the content of every experience. For these reasons I shall assume the second approach. On the second approach, direct realists, sense-data theorists, adverbialists and raw feel theorists can, in a non-committal way, subscribe to the idea that perceptual experience has truth-evaluable content.

One drawback of the second approach is that it only gives us an account of content that reflects phenomenal appearance. I shall allow for the possibility that experiences have content that does not reflect phenomenal appearance. I will use the phrase 'non-

phenomenal content' to talk about this sort of content. Content in the deflationary sense will sometimes be referred to as 'phenomenal content'.

Another drawback of the second approach is that it plausibly faces problems when the debate concerns whether content is singular or general or whether high-level properties (e.g. kind-properties) enter into the content of experience (Pautz 2008). It might also be problematic when it comes to the debate over whether the content of color experience is perspectival.<sup>2</sup> On the second conception, my color experience *e* has *something is red* as a content iff 'in having *e* it seems to me that something is red' is an accurate first-person phenomenal report. So, it may seem that, on the second conception, the debate over whether the content of color experience is perspectival amounts to a debate over whether the content of the English sentence 'something is red' used in the scope of 'it visually seems that' is perspectival, which presumably just amounts to the general issue of whether we should give a perspectival/relativist semantics for color reports in general. This, it may be said, is less than ideal because many would want to separate the issues about the content of experience from the content of language, and in particular would want to say that the issue of whether the content of experience is perspectival is a further issue distinct from the issue of whether the content of language is. If we want to do that, we need to operate with some different more substantive conception of the content of experience than the one I operate with.

I grant that there is an interesting issue here. And obviously more needs to be said about whether perceptual reports reflect the content of perception. Though I cannot argue for it here, I think it is quite plausible that first-person visual seemings reports reflect the content of perception. Furthermore, I think that the sort of content we get on the second deflationary conception is the sort of content that reflects phenomenal appearance, and there is an interesting question of whether this sort of content (linguistic or not) is perspectival. And this question can be answered without assuming any particular theory of perception. Finally, I think that, for the purposes of this paper, there is no real reason to worry about the deflationary notion of perceptual content assumed, as I believe the arguments I offer below would go through even if we had assumed that the content of perception is substantive.

### 3. Color Objectivism and the Argument from Color Variation

I will now offer an argument for the thesis that the colors are perspectival properties. Call it 'the argument from color variation'. The most popular realist theories of color, objectivist reflectance physicalism and objectivist dispositionalism, familiarly run into the problem of color variability.<sup>3</sup> According to reflectance physicalism, the colors are dispositions to reflect certain proportions of the incident light or more plausibly equivalence classes of these, for instance, disjunctive properties of reflectances that give rise to certain phenomenal effects in normal human perceivers in normal viewing conditions. According to objectivist dispositionalism, the colors are dispositions to give rise to certain phenomenal effects in normal human perceivers in normal viewing conditions.

Objectivist reflectance physicalism and objectivist dispositionalism are objectivist, because they assume that relative to the world as a whole and the human species as a whole, there is a fact of the matter as to what counts as a normal perceiver and a normal

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<sup>2</sup> Thanks to Adam Pautz for discussion.

<sup>3</sup> For a defense of physicalism, see e.g. Tye (2000), Byrne and Hilbert (2003) and Ross (forthcoming). Objectivist dispositionalism is the standard version of dispositionalism. This and other versions of dispositionalism have been defended by e.g. McGinn (1983), McDowell (1985), and Smith (1990), Johnston (1992). Thompson (1995) and Noë (2005) defend the view that the colors are ecological dispositions. For a defense of the view that the colors are the categorical grounds of dispositions, see e.g. Jackson (1996), and McLaughlin (2003).

circumstance and hence, that relative to the world as a whole, there is a fact of the matter as to what an object's color is.

However, empirical evidence indicates that this assumption is questionable. Gokhan Malkoc, Paul Kay and Michael Webster (2005), for example, report vast individual differences in which stimuli are chosen as the best examples of a unique hue (e.g. red) or a binary hue (e.g. orange).<sup>4</sup> One stimulus chosen as one individual's best example of orange, for example, was chosen by other individuals as their best example of red. We might call such cases 'shifted spectrum cases'.

Though it may be complained that shifted spectrum cases do not directly show that color perception varies across individuals, this sort of complaint need not concern us here. We can simply assume for the sake of argument that it could. Color variation of this sort is not adequately accounted for by objectivists.

There are several ways for objectivists to respond to the objection from color variability. One is to insist that normal individuals are individuals whose color vision operates the way Mother Nature originally designed human color vision to work. Michael Tye entertains this line in the following excerpt:<sup>5</sup>

many of today's human perceivers are not Normal. Their colour detection systems are not operating as Mother Nature originally designed. Genetic mutations have resulted in a shift in such humans' colour experiences. So, where some stimulus looks red to me and orange to you, for example, one of us is subject to a normal error or misperception, that is, an error or misperception occurring under everyday viewing conditions in a human perceiver who passes the usual perceptual tests for normality (2006: 342-343)

The color vision of a colorblind male, for example, is not operating the way Mother Nature originally designed human vision to operate. So, on the envisaged view, colorblind males are not normal. Hence, the deviant color experiences of colorblind males are falsidical.

There are two problems with this way of dividing humans into normal and deviant perceivers. First, there are differences in the color vision of individuals who pass standard tests of normality. These differences suggest, not that the color vision of some of these individuals is not as Mother Nature designed it to be, but rather that Mother Nature did not design human color vision to operate in just one way. Second, the envisaged view cannot easily account for cognitive development. Suppose humans develop tetrachromatic color

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<sup>4</sup> For a more comprehensive discussion of the evidence for variation in color perception across individuals of different national origin, different biological sex, etc. see Brogaard (forthcoming b).

<sup>5</sup> Tye's own view is captured in the following excerpt from his (2006):

"The upshot is that there is nothing in the Malkoc results that requires the admission that there is error at the level of coarse-grained colour experience for *Normal* perceivers under design conditions. Error arises, (as noted in Tye 2006), at the level of very fine-grained hue experiences such as that of true blue. Where at least one of John and Jane *must* be wrong is at the level of their experiences of different, determinate, finegrained hues; for *S* cannot have both the determinate, fine-grained hue John experiences it as having and the determinate fine-grained hue Jane experiences.

The truth about true blue and other determinate hues at its level of grain is that Mother Nature did not bother to design us so as to detect *them*. There was no point in Her doing so. No selectional advantage would have accrued. Thus, even when everything is working as it should, still sometimes a surface can look true blue and not be. This did not worry Mother Nature; and it should not worry us either (p. 344)."

There is something to be said for this line of argument. However, I think that the considerations I set out below and in Brogaard (forthcoming b) should raise a worry even for Tye's view.

vision. Modern humans then can distinguish colors in, say, the red region of the visible spectrum, which their ancestors could not distinguish. But Mother Nature originally designed humans to be trichromats. So, when human tetrachromats experience two ripe tomatoes whose colors are indistinguishable to trichromats as having different colors, their experiences are falsidical. But that is odd. After all, the color vision of tetrachromats is, by all important measures, better than the color vision of trichromats.

A different way to justify classifying some individuals who pass standard tests of normality as normal and others as deviant is to insist hardheadedly that there is a fact of the matter about normality and hence about the colors of objects. Byrne expresses the view as follows (in response to Jonathan Cohen):

Suppose that normal human observers S1 and S2 are viewing a chip C ... C looks unique green to S1, and bluish green to S2. The problem, as Cohen has it, is to explain "what would (metaphysically) make it the case" that S1, say and not S2, is perceiving C correctly. He purports to find the explanation "extremely hard to imagine", and so concludes that *both* S1 and S2 are perceiving C correctly. ... what "makes it the case" that S1, not S2, is perceiving C correctly, is that S1 is representing C as being unique green, S2 is representing C as being bluish green (no problem so far), and C *is* unique green, not bluish green (likewise no problem). (2006: 337)

On Byrne's view, whenever two individuals disagree about what the color of an object is or whether two objects have the same color, at least one of them is wrong, but we cannot know who (Byrne and Hilbert 2003: fn 50). This view is radical. For any colored object, there are bound to be individuals who pass standard tests of normality who disagree about the object's color. But if there is potential disagreement among normal individuals about all questions of the form 'what is the color of that object?', then answers to all such questions are unknowable. So, radical color epistemicism is true.

One may have doubts about the plausibility of epistemicism. However, even if standard-variety epistemicism is true, radical color epistemicism is most likely false. Epistemicists about vague terms such as 'tall', 'heap', and 'bald' insist that there are precise cut-offs (see e.g. Williamson 1994). For any number of hairs, there is a fact of the matter as to whether someone with that number of hairs is bald. But not all facts about baldness are knowable. While we know that a man with zero hairs is bald and that a man with a full head of hair is not, we do not know the precise cut-off between baldness and non-baldness. But if there are unknowable baldness facts, how then do we know the meaning of the term 'bald'? Simple enough: We come to know the meaning of 'bald' via exposure to definite cases of baldness. If all cases of baldness were borderline cases, we would not know the meaning of the term.

However, radical epistemicism entails that all answers to questions of the form 'what is that object's color?' are unknowable. This raises the question of how we know the meaning of color terms and color discourse. For example, how do I know the meaning of 'red'? One plausible answer is that I know the meaning of 'red' through introspection of my own red experiences. However, the redness of my own red experiences needn't be correlated with redness. For, it could be that objects that normally give rise to phenomenally red experiences in me are orange rather than red. In fact, if color spectrum inversions are possible, it could even be that they are green. It seems that Byrne and Hilbert must deny either that most of us know the meaning of color terms and color discourse, or that the meaning of color terms and color discourse is correlated with color facts. Both options seem implausible. But objectivists then have no way of defending the view that

some individuals who pass standard tests of normality are misperceiving whereas others are not. Objectivism, it seems, must be rejected.

In the face of these problems it may be tempting to reject color realism and turn to color non-realism. Non-realists are committed to an error-theory about colors. Strictly speaking, objects are not colored.<sup>6</sup> So, the differences in color vision across individuals do not seem to present a problem for non-realism. There is, however, a lurking problem. Non-realism seems to collapse into a version of imperfect realism, and differences in color perception across individuals pose no less of a problem for imperfect realism.

Here is the argument. Non-realists hold that objects do not instantiate colors, colors partially constitute the content of color perception (Chalmers 2004, 2006a), or are instantiated in a visual array (Velleman and Boghossian 1989). However, even though non-realists reject the idea that human color vision detects colors instantiated by external objects, they grant that human color vision detects *some properties or other* which are instantiated by external objects. It's just that these properties are not to be equated with the colors. In fact, non-realists probably should grant that this is so. Otherwise, they cannot account for the difference between cases in which perception is falsidical yet normal and cases where perception is falsidical yet abnormal. For example, non-realists need to account for the difference between a scenario in which a perceiver is looking at a piece of regular printer paper illuminated by red light and comes to believe on that basis that the paper is red and a scenario in which a perceiver is looking at a piece of regular printer paper in standard lighting conditions and comes to believe on that basis that the paper is white. The experience in the first scenario is faulty in a way that the experience in the second scenario is not. One way to account for the difference is to allow for experiences to be falsidical yet imperfectly veridical (Chalmers 2006a).

There are several ways to cash out the notion of imperfect veridicality. One could follow the objectivist's lead and take a color experience to be imperfectly veridical if the experience is of a kind that a normal perceiver would have when looking at the object in question in normal viewing conditions. One could then justifiably say that the perceiver who views a piece of regular printer paper in normal lighting conditions and comes to believe on this basis that the paper is white has an imperfectly veridical experience. The experience is imperfectly veridical because it is the kind of experience which a normal perceiver looking at the piece of paper in normal viewing conditions would have. The perceiver who views a piece of paper illuminated by red light and who comes to believe on that basis that the paper is red, on the other hand, does not have an imperfectly veridical experience. Her experience is falsidical through and through. But now the non-realist is no better off than the objectivist. She is forced to single out a type of perceiver as normal. But, as we have already seen, this probably cannot be done in a principled way. Non-realism by itself does not seem to be the answer to the objection from color variability.<sup>7</sup>

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<sup>6</sup> Chalmers (2006) argues that the color terms might pick out imperfect colors, that is, the properties which normally cause the corresponding perfect phenomenal experiences. Objects then are imperfectly colored but not perfectly colored.

<sup>7</sup> Chalmers (2004) allows that different normal perceivers exposed to the same stimulus can have different non-faulty experiences. But he avoids the objection from color variability not because of his (2006) non-realism about perfect colors but because he takes the physical properties in the content of perception to be picked out under different centered modes of presentation. *The property that normally causes red experiences* may pick out one reflectance type relative to me and a different reflectance type relative to you. In his (2006) Chalmers argues that color experiences have edenic content which consists of perfect properties. These properties are not instantiated in the actual world, but stand in a matching relation to physical properties which are instantiated in the actual world. Different edenic or perfect properties can match the same physical property in different perceivers. For example, relative to inverts perfect green matches the physical property which

#### 4. Color Perspectivalism

So, how should we respond to the color variability data? I propose that we treat colors as perspectival properties, properties which objects can possess only relative to a perceptual perspective.<sup>8</sup> Call this view 'perspectivalism about color properties'. On this view, ripe tomatoes possess the property red only relative to a perceptual perspective. This view may seem radical. However, most objectivists are already committed to a weak form of perceptual relativity. Objectivists who believe that there is a plurality of possible worlds, for example ersatz worlds, must deny that objects simply possess properties. They possess properties only relative to a world. A ripe tomato does not simply have the property of being red. It has the property of being red relative to the actual world, but relative to a different world it has the property of being blue. What I suggest is that there are some properties, including the color properties, which can be possessed only relative to a world, a time, an individual and perhaps other features. Or more simply put: I suggest that some properties can be had by objects only relative to centered worlds; they are centered properties.

It is still an option for the color perspectivalist to treat colors as reflectance types.<sup>9</sup> For example, we can treat blue as denoting that disjunction of surface reflectances which give rise to phenomenally blue experiences in the perceiver in normal viewing conditions. Colors then are instantiated by objects only relative to perceivers. There is still an objective fact of the matter as to whether an object O possesses a particular reflectance type T. O possesses T just in case O possesses one of the disjunct properties. But whether or not T counts as red depends on which centered world we look at. Relative to a centered world in which I occupy the center, T may count as red, and relative to a centered world in which you occupy the center, T may count as orange. So, even though O instantiates T relative to the world as a whole, O instantiates red relative to a centered world in which I occupy the center, but instantiates orange relative to a different centered world in which you occupy the center.

Though this version of reflectance physicalism fares better than the original version, I still find it unattractive. The main reason is that I think that the colors are normally directly revealed to us in color perception. For this reason I prefer a centered version of realist

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perfect red matches in nonverts. This view can thus account for differences in the edenic content of the color experiences of different perceivers exposed to the same stimulus.

<sup>8</sup> Chalmers (2004) argues that the content of perception contains centered modes of presentation such as *the property of being the property that normally causes phenomenally red experiences in me*. For Chalmers, however, the modes of presentation that figure in perceptual content are not the colors. Egan (2006) argues that objects possess centered appearance properties (or 'centered features', as he calls them) in addition to the colors. Thus, relative to nonverts tomatoes possess the feature *being able to cause phenomenally red experiences in them*, and relative to invert tomatoes possess the feature *being able to cause phenomenally green experiences in them*. However, Egan argues that the centered appearance features are not the colors.

<sup>9</sup> Views closely related to perspectival physicalism have been defended by e.g. Jackson and Pargetter (1987) and McLaughlin (2003). I also think Chalmers' view (2006) of ordinary color discourse can be construed as a version of perspectival physicalism. Though Chalmers denies that objects possess perfect colors, he allows that objects possess imperfect colors. The imperfect colors are the properties that normally cause the corresponding phenomenal experiences. This view seems to entail that the same physical property may count as imperfect red in one perceiver and as imperfect green in a different perceiver. For example, the reflectance type of ripe tomatoes normally causes red experiences in nonverts and hence counts as imperfect red relative to nonverts but it normally causes green experiences in inverters and hence counts as imperfect green relative to inverters.

primitivism.<sup>10</sup> Call it ‘perspectival r-primitivism’. On this view, the colors are primitive properties which are directly revealed to us in color perception and which are instantiated by objects relative to perceivers and normal viewing conditions. Relative to me, red is that perfect, primitive property which tomatoes, cooked lobsters and fire engines appear to have in normal viewing conditions.

One consequence of relativising to perceivers rather than groups of perceivers is disturbing, at first sight. If the colors are properties which objects instantiate only relative to perceivers, then the deviant color experiences of color blinds and other individuals who do not pass standard tests of normality come out as veridical and their first-person color attributions come out as true.

However, I am not too worried about this consequence. Color blinds and others who deviate from majority perceivers may still use color terms deferentially or generically. As we will see below, colorblind perceiver’s deferential attribution of red to tomatoes may be true, even if her first person attribution of red to tomatoes is false. In public discussion forums, we naturally assume that color attributions are generic.

Perspectival r-primitivism reintroduces the problem of what counts as a normal viewing condition. However, I think the answer to this question is easier to come by than the answer to the question of what counts as a normal perceptual system. I propose that normal viewing conditions are *publicly* appropriate viewing conditions. What counts as a public viewing condition depends in part on arbitrary conventions in the linguistic community and may vary from object to object. A normal viewing condition for a kind of object that is always spinning will be different from a normal viewing condition for a kind of object that is usually at a standstill (cf. Harvey 2000: 144). There is no one normal type of viewing condition even for a particular kind of object. The range of types of viewing conditions that count as normal for Australian mailboxes in English is not limited to bright uniform sunlight at noon. For example, owing to color constancy, viewing conditions that leave Australian mailboxes partially shaded and partially lit by bright sunlight are included in the range of normal types of viewing conditions for these kinds of objects.

## 5. Perspectivalism and Color Discourse

Let us turn now to color discourse. It is a reasonable assumption that the answer to the question of which semantics is the correct semantics for color discourse will depend on the nature of the colors. It is plausible that the colors simply are the content of color terms. The content of ‘red’, then, is red, the content of ‘blue’ blue, and so on. Below I will consider an alternative proposal. But given this assumption, a perspectival account of the colors entails a perspectival semantics for color discourse. On a perspectival account of the colors, red is a primitive color property which an object possesses relative to a perceiver and publicly appropriate viewing conditions. For example, if I say ‘that is red’, the content of my utterance is true only relative to a perceiver and publicly appropriate viewing conditions.

The context of utterance determines which centered worlds and hence which perceivers are relevant for the evaluation of color discourse.

For first-person uses of color terms, the relevant perceiver is the speaker. So, if I say ‘that is red’, the content of my utterance is true only if the demonstrated object possesses primitive redness relative to a centered world whose centered features include me and a publicly appropriate viewing condition. More precisely: We can assign a monadic truth

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<sup>10</sup> The view is defended in Brogaard (forthcoming b) and Brogaard (manuscript). There is also some discussion of the view in Brogaard (forthcoming c). The Appendix defends r-realism against a popular objection to the view. Versions of r-primitivism have also been defended by e.g. Campbell (1993), Maund (1995) and Yablo (1995). The view is discussed in Byrne and Hilbert (2007). Chalmers (2006) defends the view that the content of perception contains primitive perfect color properties (or edenic properties, as he calls them) but on his view, objects do not possess these properties.

property to 'that is red' as follows. Relative to a world @, a time t, a speaker S, a first-person use of 'red' U, a function  $f_1$  from S to a linguistic community C, a function  $f_2$  from C to an publicly appropriate viewing condition V, an object O, a function  $f_3$  from S and O to a viewing W, and a demonstration D by S of O, the sentence 'that is red' is *true simpliciter* iff the proposition expressed by 'that is red' given D and U is true relative to W in V. Alternatively, we can assign a polyadic truth property to 'that is red' as following. The sentence 'that is red' is true relative to  $\{ @, t, S, U, D, O, f_1, f_2, f_3 \}$ . As mentioned at the outset, whether one assigns a monadic truth-property to sentences-relative-to-sequences-of-parameters or a polyadic truth-property to truth-apt sentences in isolation is a methodological choice which does not affect the conclusions about perspectivalism or pluralism about truth.

It should be noted that the view just outlined allows for error in publicly inappropriate viewing conditions. Suppose I am looking at an albino tomato illuminated by red light. I might say 'that is red' but I would be mistaken, as the object is white relative to a centered world whose centered features include me and a publicly appropriate viewing condition.

Color terms may also be used deferentially. Utterances of color attribution sentences containing color terms used deferentially are true only if their content is true relative to a centered world in which the perceiver deferred to and a publicly appropriate viewing condition are marked. For example, if a perceiver who has only black and white experiences utters the sentence 'that is red', using 'red' to defer to someone who can perceive red, her utterance expresses a proposition to the effect that the demonstrated object is red, and this is true only if the demonstrated object is red relative to a centered world whose centered features include the perceiver deferred to and a publicly appropriate viewing condition.

Generic uses of color terms are also deferential. But the perceiver deferred to is not a particular perceiver but rather an arbitrary perceiver within a linguistically-agreed-upon normal range. Utterances of generic sentences are true just in case their content is true relative to centered worlds whose centered features include a publicly appropriate viewing condition and an arbitrary normal perceiver from the speaker's linguistic community. For example, my utterance of the sentence 'In Australia, mailboxes are red' is true just in case the content is true relative to centered worlds in which an arbitrary normal perceiver from my linguistic community and a publicly appropriate viewing condition are marked.

Sentential operators can shift the parameters of the circumstance of evaluation. Here are some examples of operators: 'As dichromats see things', 'As far as the inverted perceiver is concerned', 'In view of the perceptual perspective of a tetrachromat'. For example, 'as dichromats see things' chooses as a circumstance of evaluation a centered world whose centered features include a dichromat. Thus, my utterance of the sentence 'as dichromats see things, Australian mail boxes are gray' is true just in case the content of 'Australian mail boxes are gray' is true at a centered world whose centered features include a dichromat and an appropriate viewing condition.

The extension of color terms also sometimes shifts when they occur in visual seeming and seeing reports. Consider, for instance, 'It visually seems to John, who is a dichromat, that Australian mailboxes are gray'. The latter can be true even if it doesn't visually seem to perceivers like me that Australian mailboxes are gray. Likewise, the sentence 'John, who is unable to distinguish red from green, saw the candle change its color from red to green' seems plainly false even if John observed a candle that underwent a change in color properties relative to perceivers like me.

Of course, it is plausible that color terms are not directly referential, and hence that the colors are not the contents of color terms. One could be a conceptualist about color terms and hold that the color terms express color concepts (similar to the individual,

generic, demonstrative, pure and direct color concepts discussed in Chalmers 2003) which then pick out primitive color properties.<sup>11</sup> On this view, the semantics of color discourse also turns out to be perspectival. An utterance of the sentence 'that is red', where 'red' is used non-deferentially, is true just in case, relative to the speaker and an appropriate viewing condition, the object possesses the property picked out by the first-person color concept red.

The view that color terms express color concepts is motivated by the fact that someone who has never been exposed to particular colors can use color discourse competently. For example, Frank Jackson's Mary can speak competently about the color of blood and cooked lobsters, what happens when red is mixed with yellow, whether red is more similar to orange than to blue, and so on. A defender of the direct referential view of color terms might point out that the envisaged scenario can also be explained on the assumption that Mary is using color terms deferentially. However, a defender of the conceptual view could rejoin that the fact that color terms can be used both deferentially and non-deferentially shows that color terms are associated with different color concepts. So, it is possible that the conceptual view has a slight advantage over the direct referential view with regard to these matters.

The direct referential view, on the other hand, has a slight advantage over the conceptual view in offering a better account of shared content. On the direct referential view, if I point to an object and say 'that is red', using the term 'red' non-deferentially, and a perceiver who has only black and white experiences points to the same object and says 'that is red', using the term deferentially, then our utterances express the same proposition. Not so on the conceptual view. On the conceptual view, my use of the term 'red' expresses one color concept, and the black and white person's use of the term 'red' expresses a different color concept. So, our utterances express different propositions.

However, both views offer appropriate accounts of deferential and generic uses of color terms. On either view, color terms used deferentially pick out colors relative to an appropriate viewing condition and the perceiver deferred to, and color terms used generically pick out colors relative to an appropriate viewing condition and an arbitrary normal perceiver.

We are now in a position to specify the veridicality conditions for color perception. Recall that on the deflationary notion of perceptual content assumed in this paper, an experience *e* has a given proposition *p* as a content just in case 'in having *e*, it visually seems to me that *p*' is an accurate (first-person) phenomenal report of the experience. So, the content of color experience either contains or picks out the colors, depending on whether the color terms that occur in phenomenal reports are directly referential or not. For example, the content *R is red* either contains or picks out the color red. But objects possess colors only relative to the perceiver and an appropriate viewing condition. It follows that the content of color experience has a truth-value only relative to the perceiver and an appropriate viewing condition. For example, the content of my experience as of *R* being red is true relative to me and condition *C* only if *R* is red relative to me and *C*, and the content of your experience as of *R* being red is true relative to you and *C* only if *R* is red relative to you and *C*. A perspectival account of the colors thus entails that the semantics for the content of color experience is perspectival. As for color experience assessments, we can say that a perceptual experience is veridical or 'accurate' just when (all of) its content is true relative to the perceiver and an appropriate viewing condition. So, setting aside non-phenomenal content, my experience as of *R* being red is veridical only if *R* is red relative to me and an

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<sup>11</sup> The concepts discussed in Chalmers (2003) are phenomenal concepts. They pick out phenomenal properties, not primitive color properties. However, I believe similar distinctions could be made with respect to color concepts that pick out primitive color properties. E.g. a direct color concept is one that is partially constituted by a primitive color property with which one is directly acquainted.

appropriate viewing condition, and your experience as of R being red is veridical only if R is red relative to you and an appropriate viewing condition.

## 6. Relationalism and Color Discourse

Let me conclude by considering an alternative account of color discourse offered by Jonathan Cohen (2004). On Cohen's view, the colors are relational properties that integrate perceivers and viewing conditions.<sup>12</sup> No object is simply red, though it may be red-relative-to-me-and-my-current-viewing-condition. Of course, we normally use non-relativized color terms. But Cohen's view does not entail a widespread error-theory about color discourse. For, it is assumed that there are tacit argument places for perceivers and viewing conditions in the sentence structure of color attribution sentences, which get filled in context. My utterance of the sentence 'tomatoes are red' in circumstance C has the content of 'tomatoes are red-relative-to-me-in-viewing-conditions-C', and John's utterance of the sentence 'tomatoes are red' in viewing conditions C has the content of 'tomatoes are red-relative-to-John-in-viewing-conditions-C'. Cohen's view is a kind of indexical perspectivalism (or contextualism). It treats sentences containing 'red' as having different contents in different contexts of utterance. Because it treats colors as relational properties that integrate perceivers and viewing conditions, the view can easily accommodate variations in color vision.

To adjudicate between perspectivalism and relationalism we must go beyond color variability considerations. We might, for example, consider which view offers the better treatment of color discourse. It may be said that there is no expectation that a theory of color should offer an account of color discourse. I disagree. Though I cannot argue for it here, I believe a good theory of color needs to tell both a story about what the colors are and a story about what our color words refer to. Moreover, relationalists are quite happy to say that color terms refer to colors. So, one way to adjudicate between relationalism and perspectivalism is to look at how relationalism fares compared to perspectivalism in this respect. I think perspectivalism offers a better account of color discourse than relationalism.

One problem for the relationalist account of color discourse is that that it violates the shared content intuition. For example, it cannot easily accommodate the intuition that when John and I both utter the sentence 'that is red' we have said the same thing. Likewise, it cannot easily accommodate the intuition that when John accepts the sentence 'that is red' and I accept the sentence 'that is not red', then there is proposition whose truth-value John and I disagree about faultlessly.

Cohen considers this objection but replies that ordinary folks can agree and disagree because ordinary color attributions are tacitly relativised to less fine-grained visual systems and viewing conditions. However, surely there are cases in which one speaker utters the sentence 'that is red' and another replies 'no, you're wrong. That is not red. That is orange', and where the speakers tacitly disagree about what sort of visual system or viewing condition is average or standard. In such cases, Cohen is required to say that there is no proposition that is the object of disagreement. But that seems false. Even if the disagreement is faultless, intuitively there *is* a proposition that the object of disagreement, viz. the proposition that the demonstrated object is red.

A second problem for relationalism is that it doesn't offer a straightforward account of generic color discourse and other deferential uses of color terms. Suppose I utter the

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<sup>12</sup> Relationalism just says that the colors are relational properties that integrate perceivers and viewing conditions, it does not say anything about the nature of the relational property. So a dispositionalist view that takes the colors to be relational properties that make reference to perceivers is a kind of relationalism. Strictly speaking, dispositionalism that takes the colors to be relational properties that make reference to normal perceivers is a kind of relationalism but this version, of course, runs into the objection from color variability.

sentence 'In Australia mailboxes are red' in viewing conditions C. The content of my utterance clearly isn't that of 'In Australia mailboxes are red-relative-to-me-in-viewing-conditions-C'.

Cohen could perhaps account for these sorts of cases by appealing once again to less fine-grained visual systems and viewing conditions. But his view does not seem to yield a satisfactory account of generic statements such as 'As far as dichromats are concerned, Australian mailboxes are gray' and 'It visually seems to inverted perceivers that ripe tomatoes are primitively green'. If I utter the first sentence in viewing conditions C, for example, I am not saying that as far as dichromats are concerned, Australian mailboxes are gray-relative-to-perceivers-like-me-in-viewing-conditions-like-C. Likewise, if I say 'ripe tomatoes visually seem to instantiate the color red to both inverts and nonverts' in viewing conditions C, I am not saying that ripe tomatoes visually seem to instantiate the color red-relative-to-perceivers-like-me-in-viewing-conditions-like-C to both inverts and nonverts.

Cohen could now say that in such cases the values assigned to the tacit indexical variables in the sentence structure for viewing conditions and perceivers are those of dichromats, inverted perceivers, etc. But that would make the operators context-shifting operators or *monsters*, as they would bring about a shift in context, which in turn would bring about a shift in the default semantic value of a tacit indexical expression. Yet, if David Kaplan (1989: 510) is right, then there are no monsters in English. And it is quite plausible that Kaplan is right. For example, you cannot use the sentence 'As far as you are concerned, I am hungry' to express the proposition that as far as you are concerned, you are hungry or the sentence 'As far as you guys are concerned, we are hungry' to express the proposition that as far as you guys are concerned, you guys are hungry.

Deferential uses of color terms present yet another difficulty for the relationalist. Suppose you look at a ripe tomato and say 'that is red'. Suppose furthermore that I have only black and white experiences. I might nonetheless correctly say 'that is red', using 'red' deferentially to refer to the color attributed by your experience. In this scenario, the content of my utterance clearly isn't that of 'that is red-relative-to-me-in-circumstance-C'. The latter is plainly false.

In sum, relationalism can accommodate variations in color perception, but unlike perspectivalism it fails to offer a satisfactory account of color discourse.

#### Appendix: R-Primitivism, Permuted Earth and Strong Necessities

R-primitivism (of any sort) has had few defenders.<sup>13</sup> One reason for this may be that, owing to the fact that it rules out Permuted Earth scenarios, it would seem that it cannot avoid equating primitive color properties with reflectance types. The objection is set out in Byrne and Hilbert (2007), and it runs as follows: though r-primitivists deny that the colors are reflectance types, they think there are nomological connections between the colors and reflectance types. As Byrne and Hilbert (2007) put it, they think that, for any color *c*, there is a reflectance type *P* such that *P* is nomologically coextensive with *c*. However, a Permuted

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<sup>13</sup> It is sometimes claimed that primitivism has had few defenders because people find it intuitively implausible that objects possess primitive color properties. I do not have those intuitions. But clearly some do. However, there are several things one can say to make it easier for the opponent to swallow the claim that objects possess primitive color properties. First, the intuition that they do not is not pre-theoretic. Pre-theoretically I think people have the intuition that objects are primitively colored. Second, there are lots of properties which objects possess only in virtue of possessing other more fundamental properties. A few examples: being achy, being itchy, being attractive, being tasty, being tall, being bald, and being old. Third, primitive color properties are not instantiated relative to possible worlds; they are instantiated relative to centered worlds. Fourth, the assumption that objects instantiate primitive color properties helps to explain psychological properties of people. E.g. the fact that the ball was primitively red relative to Lisa explains why Lisa wanted it and what motivated her to steal it.

Earth objection now arises. Permuted Earth is a physical replica of Earth. On Permuted Earth there are uncooked lobsters, unripe tomatoes, cucumbers, spring leaves, and so on. While these Permuted Earth objects possess the same reflectance tokens as the analogous objects possess on Earth, they do not possess the primitive color property green on Permuted Earth. Uncooked lobsters are primitively orange, unripe tomatoes are primitively blue, cucumbers are primitively pink, and so on. Because Permuted Earth perceivers are physical replicas of us, objects that possess the primitive color property pink and hence are pink according to the r-primitivist do not look pink to them. For example, in spite of being primitively pink, cucumbers look primitively green.

The possibility of this sort of scenario poses a problem for the r-primitivist who thinks that there are only nomological connections between the colors and reflectance types. The problem, as I see it, is this. At the scenario in question there is no interesting connection between the instantiated primitive color properties and the way things look (i.e., the “grasped” primitive color properties do not match the instantiated primitive color properties). So, on Permuted Earth it could easily be that red is more similar to green than to orange. For example, suppose Russellian physicalism is true. According to Russellian physicalism, one can hold all the physical facts fixed and still have zombie worlds, because to hold the physical facts fixed just is to hold the physical properties to which our best physical theories commit us fixed. The intrinsic (non-functional and non-measurable) physical properties can still vary. So, if Russellian physicalism is true, and the primitive colors supervene on the intrinsic nature of things, then it is possible for primitive red to be more similar (intrinsically) to primitive green than to primitive orange. So, there is nothing about Permuted Earth to rule out that instantiated primitive red is more similar (intrinsically) to instantiated primitive green than to instantiated primitive orange. Yet, despite the fact that Permuted Earth is a physical replica of the actual world, Permuted Earth perceivers cannot come to know that red is more similar to green than to orange through careful reflection on their color experience. To them it will still seem that red is more similar to orange than to green. So, if the actual world is different from Permuted Earth in this respect, and revelation obtains at the actual world, then the ‘r-primitivist must admit that there is some kind of pre-established harmony or bizarre cosmic coincidence’ (2007: 35).<sup>14</sup> But this sort of pre-established harmony cannot be taken seriously. So, this version of r-primitivism must be rejected.

Byrne and Hilbert consider the possibility of positing metaphysical connections between the instantiated primitive color properties and the reflectance types. Following Byrne and Hilbert the r-primitivist might say that ‘for any color *c*, there is a reflectance type *P* such that *P* metaphysically necessitates *c*.’ But this, Byrne and Hilbert say, only leads to further trouble. For, if there are metaphysically necessary connections between reflectance types and primitive colors properties, then it would seem that the primitive color properties just are the reflectance types.

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<sup>14</sup> R-primitivism is to be understood as being conceptually committed to revelation. Byrne and Hilbert divide Revelation into the following two principles:

Self-Intimation: If it is in the nature of the colors that *p*, then after careful reflection on color experience it seems to be in the nature of the colors that *p*.

Infallibility: If after careful reflection on color experience it seems to be in the nature of the colors that *p*, then it is in the nature of the colors that *p*.

Reflectance physicalism and dispositionalism violate Self-intimation.

How might the r-primitivist respond to this objection? I suggest that the r-primitivist takes primitive color properties to supervene on physical and phenomenal facts. Revelation is true at the actual world and at physical-phenomenal replicas of the actual world. However, there are metaphysically possible worlds in which the instantiated primitive color properties are not revealed in color perception but in which objects still cause us to experience objects as possessing primitive colors. In these worlds the perceived primitive colors do not match the instantiated primitive colors. At such worlds, Revelation is false (or true by sheer luck). But such worlds are presumably very different from ours evolutionarily and nomologically.

Two related objections to the proposed version of r-primitivism here arise. First, it may be said that it may be desirable if things could look one way to us but have a different primitive color, even in physical-phenomenal copies of our world. Most r-primitivists allow there to be illusions. A case in which things looked one way to us but had different primitive colors would just be a case of systematic illusion. On a realist view, it is often thought to be desirable if systematic illusions are possible.

Second, it might be thought that if the Permuted Earth scenario is not possible, then at least it is conceivable. But a version of r-primitivism that takes the primitive color properties to supervene on physical and phenomenal facts rules out the possibility of Permuted Earth. But it follows then that there are (ideally) conceivable scenarios which are impossible. Hence, the r-primitivist who takes the primitive color properties to supervene on the phenomenal and physical facts seems committed to what Chalmers (2003) calls 'strong necessities', that is, necessary truths which involve no so-called twin-earthable concepts but which nonetheless are (ideally) conceivably false. Chalmers defines 'twin-earthability' as follows:

We can say that two possible individuals (at times) are twins if they are physical and phenomenal duplicates; we can say that two possible expression tokens are twins if they are produced by corresponding acts of twin speakers. Then a token is Twin-Earthable if it has a twin with a different 2-intension. (2006b: section 3.5)

A twin-earthable concept is one which has a different 2-intension (or Russellian intension) when possessed by physical-phenomenal duplicate thinkers. The concept of water is twin-earthable. When possessed by Oscar its 2-intension yields H<sub>2</sub>O at every possible world. When possessed by Twin-Oscar its 2-intension yields XYZ at every possible world. Non-twin-earthable concepts are by definition concepts which, when possessed by twins, have the same 2-intension. For conceivability and possibility to come apart, a twin-earthable concept is required. For example, 'water (if it exists) is H<sub>2</sub>O' is necessarily true but conceivably false; its actual 2-intension yields 'true' as its extension at every scenario, but its 1-intension (or Fregean intension) yields 'false' at Twin Earth scenarios. Strong necessities involve no twin-earthable concepts. So, there are no strong necessities (see e.g. Chalmers 2003).

However, our envisaged objector might continue, our r-primitivist is committed to the view that there are necessary truths that do not involve any twin-earthable concepts but which nonetheless are conceivably false. Take, for example: 'Primitive color properties supervene on other primitive properties'. This alleged truth plausibly involves no twin-earthable concepts yet it is a necessary truth which is (ideally) conceivably false. Or so the objection goes.

By way of reply: I don't think the proposed version of r-primitivism needs strong necessities or should allow for systematic illusions in physical-phenomenal copies of our world. The r-primitivist should hold that it is ideally inconceivable that all physical and phenomenal facts are as they actually are but somehow objects do not have the instantiated or grasped primitive colors they actually have.

As for systematic illusions, primitivism is motivated by the view that we can determine various second-order color facts simply by reflecting on our past color experience (e.g., the fact that red is more similar to orange than to green). But if there could be systematic illusions in physical-phenomenal copies of our world, then setting aside the possibility of pre-established harmony, we could not have anything close to infallible knowledge about relations among primitive color properties in the actual world. Hence, Revelation is false at the actual world.

It might be replied that the r-primitivist who denies that the colors supervene on physical and phenomenal facts and hence allow for Permuted Earth scenarios can tell the same story about armchair knowledge of second-order color facts as an irrealist primitivist and hence can say that Revelation is true. The reason, it might be thought, is this. R-primitivists who deny that the supervenience story do not need to know that what gives rise to red experiences is similar to what gives rise to orange experiences in order to know that red is similar to orange. On the primitivist story (realist or irrealist), red need not be the property which gives rise to red experiences. Rather, one grasps redness directly in experience, and through one's concept of redness, regardless of whether how redness is distributed in the external world.

However, I don't think that is right. To illustrate consider a weird world—a physical-phenomenal but not, say, proto-phenomenal (or color-wise) copy of ours:

Ripe tomatoes: primitive green.	Grasped: primitive red
Pink ribbons: primitive red	Grasped: primitive pink.
Blueberries: primitive orange	Grasped: primitive blue

We can tell the following perfectly consistent story about this world. Primitive red is more similar to primitive green than to primitive orange because primitive red has more intrinsic proto-phenomenal properties in common with primitive green than with primitive orange. One cannot then say: but primitive red *is* more similar to orange than to green because of how the primitive color properties we grasp (illusively) look to us when we grasp them. Physical-phenomenal copies of our world cannot be systematically illusory if r-primitivism is right.

To say this, however, is not to say that the r-primitivist cannot accept systematically illusory worlds, but only that systematically illusory worlds are not physical-phenomenal copies of the actual world. Systematically illusory worlds are worlds where the primitive color properties grasped in experience are not instantiated, or perhaps are instantiated by objects other than the ones that cause experiences as of those properties. Either way these worlds will fail to be physical-phenomenal copies of our world.

As for conceivability, if the r-primitivist were to hold that it is (ideally) conceivable both that r-primitivism is true, and that there are physical-phenomenal replicas of our world in which primitive color properties have some proto-phenomenal nature that goes well beyond what is grasped in experience, then she would be committed to saying that it is conceivable both that r-primitivism is true and that Revelation is false at physical-phenomenal copies of our world. As pre-establish harmony is inconceivable, she would be committed to saying that it is conceivable both that r-primitivism is true and that Revelation fails at the actual world. But the version of r-primitivism that we are considering here is conceptually committed to the truth of Revelation at the actual world. So, if r-primitivism is true, then a weird world (like the one above) which is a physical-phenomenal copy of our world but in which the primitive color properties have some intrinsic proto-phenomenal nature that goes well beyond what is grasped in experience is (ideally) inconceivable. So, the objection is avoided.

R-primitivism, of course, fares no better than reflectance physicalism with respect to the objection from color variability, hence the need for perspectivalism.<sup>15</sup>

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