

Color relationalism, ordinary illusion, and color incompatibility

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Abstract. Relationalism is a view popularized by Cohen according to which the colors are relational properties. Cohen's view has the unintuitive consequence that the following propositions are false: (i) no object can be more than one determinate or determinable color all over at the same time; (ii) ordinary illusion cases occur whenever the color perceptually represented conflicts, according to (i) above, with the object's real color; and (iii) the colors we perceive obey (i). I investigate Cohen's attempt to address these intuitive propositions with which his view struggles and find it to be incompatible with how he motivates his view.

Relationalism is a metaphysical view on color that has been popularized by Cohen (2004; 2006; 2007; 2009). Roughly, the view holds that colors are relational properties that integrate objects and observers. Cohen's view can be more rigorously presented as follows (Roberts, 2014):

Relationalism: It is constitutive of (or essential to) any color L that there is a three-place relation R such that for all x , x has L iff for a viewing subject y_1 and a viewing circumstance y_2 , Rxy_1y_2 .¹

¹ In the past, I have left viewing circumstances out of the formulation of Cohen's view (Roberts, 2014). Adding them further complicates the presentation, but for this article I think it is worth doing so.

Relationalism can be split into two versions that are close to the surface in Cohen's (2004; 2009) work. Cohen's view 1 requires condition 1 below for when x bears R to y_1 and y_2 , and Cohen's view 2 requires condition 2 (Roberts, 2014).

1. R holds of $\langle x, y_1, y_2 \rangle$ iff y_1 is a viewing subject in circumstance y_2 and y_1 is having a perception as of x being L .

2. R holds of $\langle x, y_1, y_2 \rangle$ iff if a viewing subject y_1 in a viewing circumstance y_2 were to view x , then y_1 would have a perception as of x being L .

Cohen's view 2 better captures relationalism understood as a kind of dispositionalism or role functionalism about color. I have provided both formulations here to be thorough, but everything I say below applies to Cohen's view 1 and 2. Thus, I will just speak of relationalism.

Color variation occurs whenever two or more perceptions represent some thing or things as having apparently conflicting colors. Relationalism gives a uniform response to color variation cases according to which everyone is right. This allows the proponent of relationalism to avoid saying one person is right over another in variation cases. He can say that everyone is right. Proponents of relationalism like this consequence, because they think any attempt to say one person is right over another would be unjustified. Unfortunately, because relationalism gives a response according to which everyone is right, it has the unintuitive consequence that the following propositions are false:

Incompatibility: No object can be more than one determinate or determinable color all over at the same time. (Examples of determinate colors are scarlet, jade, aquamarine, and sand. Examples of determinable colors are red, orange, yellow, and green. Reddish, yellowish, greenish, etc are super-determinable colors and so are not relevant to

Incompatibility as defined. If the determinate/determinable division should be understood as graded in nature, then this can be easily accommodated by adding “of the same grade” to the above statement of Incompatibility.)

Illusion: Ordinary illusion cases occur whenever the color perceptually represented conflicts according to Incompatibility with the object’s real color. (The use of “ordinary” in the definition of Illusion rules out illusion cases due to deviant causal chains like the case involving Cohen’s telekinetic tomato, 2007, p. 341. So, according to Illusion, an ordinary illusion occurs, for example, if x is red and S perceptually represents it as being blue and S’s representation is not the result of deviant causal chains.)

Incompatibility and Illusion are extremely intuitive. Incompatibility is cited alongside mathematical truths like $2+2=4$ as a quintessential example of a synthetic a priori certainty. Illusion is intuitive, for it is biconditionally associated with the following intuitive proposition:

P-Incompatibility: The colors we perceive obey Incompatibility.

Thus, in addition to implying the falsity of Incompatibility and Illusion, relationalism also implies that P-Incompatibility is false. Perhaps all these intuitions are in fact false. However, it certainly seems that it would be best if relationalism could say something about them.

Cohen appears to agree. Cohen (2007; 2009) differentiates between hallucinations, illusions due to deviant causal chains, and ordinary illusions. Of these three kinds of perceptual error, only ordinary illusions are relevant to this article. Cohen claims to provide a “relationalist treatment” of ordinary perceptual illusion (2007, p. 342-345; 2009, p. 122-132). Under one interpretation of what is going on, this “treatment” is not an attempt to explain away the intuition that Illusion is true, rather it is an attempt to (more or less) accommodate the intuition. Illusion is

true iff P-Incompatibility is true, and clearly if P-Incompatibility is true, then Incompatibility is true. So, to whatever degree Cohen can accommodate Illusion he can also accommodate Incompatibility and P-Incompatibility. Under another interpretation, Cohen is merely trying to secure the possibility of ordinary error in our color language and color thought. Under this interpretation, Cohen is not concerned with accommodating Illusion.

The purpose of this article is to investigate whether Cohen's "relationalist treatment" can succeed. Ultimately, I plan to show that Cohen's treatment is incompatible with his motivation for relationalism. In section 1, I focus on distilling the two interpretations of Cohen's treatment. In section 2, I argue that Cohen's treatment under the first interpretation is logically incompatible with his argument from perceptual variation and in serious tension with it under the second interpretation, and that his response, regardless of interpretation, is in serious tension with his basic arguments for the first premise of his argument from perceptual variation. Finally, in section 3, I look at whether Cohen can avoid my criticisms. Specifically, I look at whether the basic arguments can be modified and at an attempt to explain away our intuitions. My goal in this paper is not to prove that relationalism is false, but to make it clear beyond doubt that Cohen's "relationalist treatment" of Illusion is seriously problematic for him.

1 Cohen's relationalist treatment

What follows is my distillation of Cohen's treatment of ordinary perceptual illusion. Cohen (2007, p. 342-345; 2009, p. 122-132) attempts to accommodate Illusion by distinguishing between fine-grained and coarse-grained relational color properties L that invoke different

versions of the condition on when R holds of $\langle x, y_1, y_2 \rangle$.² With respect to fine-grained color properties, the condition is the same as that given by Cohen's view 1 (or 2 if one prefers). An example of a fine-grained property is the property of being red to me in *this* my current circumstance. Cohen seems to call such properties fine-grained because the conditions necessary and sufficient for an object to have them are narrowly defined. For example, the property of being red to me in *this* circumstance (a low light environment) is a different property from being red to me in *that* circumstance (an environment in which the lighting is brighter). With respect to these fine-grained colors, whenever a subject has a perception as of an object being a color, the object is that color. Thus, as I understand Cohen, Illusion and Incompatibility are false with respect to fine-grained colors. If Illusion is false, then P-Incompatibility is false too.

I shall now look at Cohen's coarse-grained colors. With respect to these colors, R holds of $\langle x, y_1, y_2 \rangle$ iff y_1 is a *normal* viewing subject in a *normal* circumstance y_2 and y_1 has the perception as of x being L (or if one prefers iff if a *normal* viewing subject y_1 in a *normal* viewing circumstance y_2 were to view x , then y_1 would have a perception as of x being L).³ An example of a coarse-grained color is the property of being red to perceivers similar to me (normal ones) in circumstances like those I usually encounter (normal ones). Cohen seems to call such colors coarse-grained for the conditions necessary and sufficient for an object to have them are broadly defined. For example, an object having the property dark-green to me in *this* circumstance (a low light environment) or the property light-green to me in *that* circumstance (a brighter environment) can be compatible with it also being coarse-grained red.

² Cohen (2009; 2007, p. 340) accounts for errors in color perception due to hallucinations and deviant causal chains without having to distinguish between coarse-grained and fine-grained colors. Errors due to deviant causal chains cannot account for Illusion, because this intuition, as I define it, rules out deviant causal chains.

³ There are two important things to note here. First, Cohen thinks that there are no *principled* specifications of 'normal observer' and 'normal circumstances.' Second, it seems there can be different kinds of coarse-grained colors, but for simplicity I am just going to work with coarse-grained colors as I have defined them.

Incompatibility (or something close) holds for the coarse-grained colors. However, whether Illusion and P-Incompatibility (or something close) are true with respect to these colors depends on whether we perceive them, because *misrepresentation in perception requires representation in perception*. Here I think Cohen is unclear. Consider this passage.⁴

Let it be that Sally the subject is invited to the psychophysics lab and is asked to view the stimulus — a[n] [un]ripe tomato as it happens — under viewing condition C. The stimulus, let us suppose, is red for Sally in condition C. Now, Sally will report that the tomato is red simpliciter just in case she takes it to be red for perceivers pretty much like herself, in circumstances pretty much like those she normally encounters. Of course, she thinks she herself is a perceiver quite a lot like herself, and she takes her present perceptual circumstance C to be pretty much like those she normally encounters, so she thinks the tacitly presupposed conditions for the ascription of red simpliciter are met. Hence, she represents the tomato as being red simpliciter, and reports as much to the experimenter. It turns out, however, that Sally has been fooled: C was constructed by the clever psychophysicist so that (i) C would lie outside the range of perceptual circumstances pretty much like those she encounters, (ii) the tomato’s appearance in C to Sally would be entirely distinct from the very same tomato’s appearance in perceptual circumstances pretty much like those she encounters, and (iii) there would be no visual clues to tip off Sally to these facts about C. [...]

In this case, I claim, Sally represents the color of the tomato erroneously. As it happens, the tomato is red for Sally in C; so if she had represented only that it is red for

⁴ In the passage, I have changed the tomato to being unripe. Cohen says the tomato “is red for Sally in condition C” and that “the tomato’s appearance in C to Sally would be entirely distinct from the very same tomato’s appearance in perceptual circumstances pretty much like those she encounters [...]” So, the tomato must be unripe.

her in C, she would have avoided error. But she did not so confine herself. Rather, because the experimental manipulation was subtle enough not to tip her off, she represented it less cautiously as being red simpliciter — which it was not. This is just to say that Sally’s representation of the tomato’s color is erroneous; and since (we are supposing) there really is a tomato that Sally perceives, the error is a textbook case of perceptual illusion. (2007, p. 343)

How are we to understand Cohen’s use of “represent”? The popular interpretation is that Cohen is just talking about representation in thought and language. This interpretation *can* be found in his work (2009, p. 116) and is the interpretation he seems to prefer. Under this interpretation, Cohen is not trying to accommodate Illusion and P-Incompatibility. Rather, he is rejecting these intuitions and just trying to maintain the possibility of ordinary error in color thought/language. Nevertheless, the accommodative interpretation under which we perceive coarse-grained colors is close to the surface in the quoted passage, for Cohen concludes by saying that Sally’s error “is a textbook case of perceptual illusion” and, as I said, misrepresentation in perception requires representation in perception. Further, when talking about another example involving Sally’s misrepresenting an object’s coarse-grained color, he says, “Here, too, we have a case of illusory representation [...]” (2007; p. 343). Does Cohen define “illusion” in some weird way? No. He says the following:

An illusion occurs when the subject perceptually represents an object *x* that she is indeed perceiving, but errs in the features she perceptually represents *x* as bearing (either by perceptually representing *x* as bearing features that *x* in fact lacks, or by perceptually representing *x* as lacking features that *x* in fact bears). (2007, p. 339)

So, given that Cohen defines illusions as involving perceptual misrepresentation, and says that Sally's misrepresentation is an illusion, indeed a "perceptual illusion," the accommodative interpretation of Cohen under which we perceive coarse-grained colors is certainly very close to the surface in the relevant (2007) work. It is worth investigating this interpretation regardless of whether it is what Cohen believes, because if it works, it allows for Illusion with respect to coarse-grained colors. With this said, *both* the perceptual interpretation of coarse-grained colors and the thought/language interpretation are operable throughout this entire paper. That is, as I shall show, my arguments apply to both the accommodative and non-accommodative interpretations of Cohen's relationalist treatment of ordinary illusion.

2 The objection from motivation

I shall now argue that Cohen's treatment is incompatible with his motivation for relationalism. I shall first show that if we perceive coarse-grained colors, then Cohen's master argument for his view rests on a false premise, and even if we do not, that his treatment is still in serious tension with said argument. I shall next show that Cohen's basic arguments used to support his master argument are in serious tension with there being coarse-grained colors, whether we perceive them or not. Cohen's master argument for relationalism is what he calls, "the argument from perceptual variation" (2009, p. 24). He states the argument in the following way:

V1. There are multiple, psychophysically distinguishable, perceptual effects (in respect to color) of a single color stimulus.

V2. There is no independent and well-motivated reason for thinking that just one of the variants catalogued at step 1 is veridical (at the expense of the others).

V3. Given that there is no well-motivated reason for singling out any single variant as veridical (at the expense of the others), an ecumenical reconciliation of the variants is preferable to an unmotivated stipulation in favor of just one of them.

V4. The best way to implement such an ecumenical reconciliation between apparently incompatible variants is to view them as the result of relativizing colors to different values of certain parameters, which is just to admit that the colors are relations between objects and those parameters. (Cohen, 2009, p. 24)

This argument has an epistemic and a metaphysical interpretation. Under the epistemic interpretation, the gist of the argument can be captured as follows: Given that there is no reason to believe that one variant is veridical rather than another, we should accept relationalism. Cohen (2004, p. 455; 2009), however, explicitly says that the argument should be understood metaphysically. The metaphysical interpretation can be stated simply as follows:

M1. There is nothing to make one perceptual variant veridical rather than another in color variation cases (involving apparently incompatible variants).

M2. The best explanation of M1 is that relationalism is true.

(3). Therefore, relationalism is probably true.

This simple reconstruction is the result of combining steps V1 and V2, and steps V3 and V4, and interpreting the premises (where necessary) in a non-epistemic way. In this article, this is the argument that I consider to be Cohen's argument from perceptual variation.

In order to show that Cohen's treatment is incompatible with his motivation for relationalism, I will show that it implies that often there is something to make one subject right over another about the colors of objects. Call this, "Often-Either." According to Cohen's treatment, it is possible for one subject to be right rather than another with respect to the coarse-grained colors. Naive Sally misrepresented (whether in perception or thought/language) the unripe tomato as being coarse-grained red, because she thought falsely that she was in normal circumstances. However, if naive Sally *had* been in normal circumstances, she would have represented the tomato correctly as being coarse-grained green. This is because unripe tomatoes (of the common variety) appear green to normal observers in normal circumstances, and presumably Sally is a normal observer. Thus, to show that Cohen's treatment implies Often-Either, I only need to argue that it implies that we often represent the coarse-grained colors. Call this, "Often-Coarse."

The argument for Often-Coarse runs as follows: Most of the time, we tacitly believe that we are normal observers, and that we are in normal circumstances. Call this, "Often-Tacit-Belief." Cohen's treatment of Sally implies that what we represent (whether in perception or in thought/language) is dependent on what we believe. The naive Sally represented the tomato as being coarse-grained red, and Sally would change from representing coarse-grained colors to representing fine-grained colors if she learned about (i) and (ii). Hence, Cohen's treatment of Sally implies that if we believe that we are normal observers in normal circumstances at time t , we represent objects as having the coarse-grained colors at t . Call this, "Belief-Dependency."

Conjoining Often-Tacit-Belief and Belief-Dependency, Often-Coarse follows. From here one can see that Cohen's treatment implies Often-Either.

From inspecting Cohen's argument, clearly Often-Either is going to be problematic. If Often-Either applies to perception, Cohen's treatment is logically incompatible with M1. This premise says that there is nothing to make one of the perceptual variants in color variation cases veridical rather than another. However, Often-Either understood perceptually implies that there is often something to make one of the perceptual variants in color variation cases veridical rather than another, namely the coarse-grained colors. Hence, if Often-Either understood perceptually is true, then M1 of the argument from perceptual variation is false.⁵ If Often-Either only applies to thought/language, then Cohen's treatment is dialectically problematic. If there were nothing to make one perceptual variant veridical rather than another, then why would there be something to make one thought/language variant veridical rather than another? Why should we accept M1 for perception while rejecting it for thought/language? Surely, if there can be something to make one thought/language variant right over another, there very likely could be something to make one perceptual variant veridical rather than another. As I shall soon show, Cohen's basic arguments for M1 are also in tension with his treatment so they will not help him here.

Cohen may try to avoid the logical incompatibility between M1 and Often-Either understood perceptually while still accounting for Illusion and P-Incompatibility by changing M1 to say that *in some fundamental sense* there is nothing to make one variant in color variation cases veridical rather than another. One way to understand this that may occur to one from

⁵ A likely response is to say that only *explicit* beliefs influence what we perceptually represent. If this response were plausible, Cohen could avoid my argument for Often-Coarse while accepting something like Belief-Dependency. Unfortunately, this response is not at all plausible. The masses seldom *explicitly* believe anything about their perceptual systems and viewing circumstances. Hence, if the response were correct, few people other than philosophers and color scientists would ever represent the coarse-grained colors. Thus, if the response were correct, ordinary perceptual illusion would at most be confined to intellectuals.

reading Cohen (2007, p. 347) is to make a distinction between the visual system and the perceptual system. The perceptual system could be understood as a larger structure than the visual system that includes elements of the cognitive system. With this distinction, one can define the fundamental sense in which there is nothing to make one variant in color variation cases veridical rather than another as having to do with the visual system alone. This move cannot work. It is analytic that the perceptual system is the system that allows us to perceive. So, if it were assumed that this system includes elements of the cognitive system, it would follow that these elements are necessary for perception. So, it would follow that the visual system alone is insufficient for perception. If this were true, it would follow that the visual system alone is irrelevant to *perceptual* variation arguments like Cohen's.⁶ Even assuming the logical incompatibility between M1 and Often-Either understood perceptually could be avoided, there would still clearly be a serious tension between them just as there is between M1 and Often-Either understood as applicable only to thought/language.

I have shown why Cohen's treatment is incompatible with his argument from perceptual variation. I shall now show that his treatment is incompatible with his basic arguments for M1. What are his basic arguments for M1? Cohen sometimes seems to be implicitly appealing to verificationist assumptions in his arguments for M1. However, Cohen has not explicitly come out as a verificationist and has never explicitly stated any verificationist based arguments for M1. Hence, I assume that Cohen is not a closet verificationist, and I interpret him under this assumption. I may be wrong. If I am wrong and Cohen is in fact a closet verificationist, then so

⁶ Perhaps Cohen could develop an argument from visual variation, but this has yet to be done. More would have to be said to understand "visual variation." What exactly is "visual variation" if not perceptual variation? Is there empirical support for it? Can it motivate relationalism while avoiding the kinds of tensions talked about in this article? Is a distinction between visual and perceptual variation conceptually coherent?

much the worse for him. With these things being said, I interpret Cohen as having three basic arguments for MI in his work. I shall look at the first two together and then the third.

The first argument is that it is difficult to imagine what could make one subject's perception as of color veridical rather than another's (2004; 2006, p. 310; 2009, p. 25, 33).

Cohen when talking about interpersonal variation says the following:

When two normal trichromatic observers view ship *C* under identical perceptual conditions, *C* looks unique green to one of them but bluish green [...] to the other. [...] It is extremely hard to imagine what could (metaphysically) make it the case that one of the representational variants is veridical at the expense of the other. (2006, p. 310)

The second argument is that it is difficult to imagine what could make, for a single subject, one of his perceptions as of color veridical rather than another (2004; 2009, p. 19-25). When talking of intrapersonal variation involving color contrast effects Cohen says the following:

[...] [I]t is difficult to imagine a well motivated, principled, and non-question-begging answer. That is to say, it is hard to imagine what, other than stipulation, could make it the case that one of the backgrounds [...] is such that when the stimulus is viewed against that one, it is visually represented as bearing the color that it has. (2009, p. 22)

The tension between Cohen's treatment and these arguments for MI is that coarse-grained color properties provide an easy route for imagining what could make one perception as of color veridical rather than another. Assume we represent coarse-grained colors. Then, what could make one perception as of color veridical rather than another is that one perception represents a

coarse-grained color that is in fact there and another represents a coarse-grained color that is not in fact there. This tension is a grave problem. Cohen's opponents already say what could make one perception veridical rather than another is that one perception represents a color that is in fact there and another represents a color that is not in fact there (Byrne and Hilbert, 2003a; 2003b; 2004). Coarse-grained colors make the situation worse. If one can imagine coarse-grained colors making one perception veridical rather than another, one can also imagine *non-relational colors* doing this, because the metaphysical story for how one perception gets to be veridical rather than another is the same regardless of whether one is talking about coarse-grained colors or non-relational colors. For both colors the story runs as follows: One perception represents a property that is not in fact there and the other represents a property that is in fact there.

This tension between Cohen's treatment and the above arguments for M1 remains regardless of whether the representation of coarse-grained colors is confined to our language and thoughts as Cohen sometimes suggests. If one can imagine coarse-grained colors making one color thought or ascription right rather than another, one can imagine non-relational colors making one perception veridical rather than another. The reason for this is that the metaphysical story about how one perception gets to be veridical rather than another is the same as the story about how one color thought or ascription gets to be right rather than another. For color thoughts, ascriptions, and color perceptions the story runs as follows: One perception or thought or ascription represents a property that is not in fact there and another perception or thought or ascription represents a property that is in fact there. This story should be familiar. It is the story about how one representation gets to be correct rather than another, and is relevant to perception, thought, language... As the same story is relevant to all these forms, if one can imagine a

representation of one form being right rather than another of that form, one can imagine a representation of another form being right rather than another of that form.

The third argument Cohen gives for M1 presupposes that non-human animals differ in the perceptual discriminations that they make. Referring to interspecies perceptual variation cases, Cohen says the following:

The four choices in logical space are these: (i) confine our attention to the human visual systems, declaring that how things look to pigeon (and other) visual systems is irrelevant to the colors of objects; (ii) defer to the pigeons, holding that the way things look to them determines the true colors of objects; (iii) declare that neither we nor the pigeons are the true arbiters of color, and instead select a different standard; (iv) adopt the ecumenical policy that both sorts of visual systems are right, and that one and the same object can have more than one color property. Considered by itself, option (i) seems objectionably chauvinistic, while, considered by themselves, (ii) and (iii) seem unduly modest. This is not to say that the chauvinism following upon (i) or the modesty following upon (ii) or (iii) is incoherent, but *only that these choices are revisionist* [emphasis mine] with respect to quite a lot of ordinary and scientific talk about color [...]. (2009, p. 27)

Cohen concludes that option (iv) is the best option. If (iv) is the best option, there is good reason to hold that there is nothing to make one perceptual variant veridical rather than another in interspecies color variation cases. That is, if (iv) is the best option, one has good reason to hold that an instance of M1 involving interspecies cases is true.

The tension between this basic argument and Cohen's treatment is that the coarse/fine-grained color distinction is revisionary. This is because the idea that coarse-grained red and fine-

grained red are both kinds of being red is unusual indeed. This tension is a serious problem for Cohen. The reason is that if one thinks that (i) is too revisionary, then one ought to question whether the coarse/fine-grained distinction is too revisionary. After all, the coarse/fine-grained distinction may be just as revisionary as the view that non-human animals do not perceive colors. Even if the coarse/fine-grained distinction were less revisionary than the view that non-human animals do not perceive colors, *it would not obviously be less revisionary* and so more would need to be said. Like with the last tensions, this tension remains regardless of whether the representation of coarse-grained colors is confined to our thoughts and talk. The distinction is revisionary because it says that coarse- and fine-grained red are kinds of being red, but the only normally recognized kinds of being red are its determinates like being scarlet.

3 Is there a way out?

Cohen could try to reformulate his first basic argument for M1 to say that it is difficult to imagine that there is *no fundamental sense* in which when two subjects' perceptions as of color disagree they are both veridical, and his second to say that it is difficult to imagine that there is *no fundamental sense* in which when two perceptions as of color had by a single subject disagree they are both veridical. Unfortunately, these reformulations are still in tension with Cohen's treatment. Let me explain. If one can imagine coarse-grained colors making one perception veridical (or one color thought or ascription correct) rather than another, one can imagine a fundamental sense in which there is something to make one color perception veridical (or one color thought or ascription correct) rather than another. If one can imagine this, one should have no trouble imagining that there is no fundamental sense in which when two color perceptions (or

thoughts or ascriptions) disagree they are both veridical: One need only imagine that there are only coarse-grained colors and that the fine-grained colors are not really colors. From here, one should have no trouble imagining that there are non-relational colors to make one perception veridical rather than another. The reason is that the metaphysical story for how one perception (or one color thought or ascription) gets to be veridical rather than another is identical regardless of whether one is talking about coarse-grained colors or non-relational colors.

It is tricky to see how a response to the tension with Cohen's third argument for M1 would go. Cohen must (at the very least) argue that the coarse/fine-grained distinction is less revisionary than the view that non-human animals do not see colors, but doing this will not be easy. Most philosophers do not hold Cohen's coarse/fine-grained color distinction (Hacker, 1991; Campbell, 1993; Tye, 2000; Byrne and Hilbert, 2003a), so Cohen probably cannot appeal to philosophers' beliefs. Moreover, scientists are careful to rely on behavioral definitions of color vision (Wright & Cumming, 1971; Palacios et al., 1990; Jacobs & Deegan, 1999). For example, Griebel and Peichl say in their article that "[t]he term 'color vision' refers to the capability of a visual system to respond differently to light differing in wavelength only" (2003, p. 19). As a result, scientists issue warnings about claiming that non-human animals see colors (Hardin, 1988, p. 148). Thus, Cohen probably can only appeal to the beliefs of ordinary people. However, the empirical evidence suggests that ordinary folk are not relationalists about color but rather anti-relationalists (Roberts et al, 2014). So, appealing to them is a bad option for Cohen. If ordinary people are to decide these issues, Cohen's view is in serious trouble.

As I have shown, the prospects for reformulated arguments for M1 are dim. So, it seems that Cohen must give up on his "relationalist treatment." Thus, it appears that there is no hope of Cohen being able to address Incompatibility, Illusion, and P-Incompatibility in any way

whatsoever. He cannot even allow for the possibility of ordinary error in color thought/language. If Cohen's view is unable to address these intuitions in any way whatsoever, does Cohen at least say something to the effect that we cannot trust them? He does say this.

[A]n opponent will suggest [that] what is needed is that there are illusions involving the representations of color in the visual system *per se*—i.e., in the visual system considered on its own, rather than considered as part of a larger cognitive/perceptual system. But I think this objection depends on treating our intuitions about error with much more evidential authority than they deserve. [...] [I]t is hard to see why we should trust intuitions about how the labor of producing these errors is divided between the visual system and other components of the cognitive/perceptual system. Surely that's something to be sorted out by (broadly) empirical inquiry, not by the armchair consultation of intuitions. (2007, p. 348-349)

Why does Cohen think that how the labor of producing error is divided should be left to empirical enquiry? The immediate answer is that he finds it hard to see why we should trust our intuitions about how the labor of producing error is divided, but what is really bothering Cohen? If one can trust our intuitions about how the labor of producing error is divided between the visual system and the cognitive system, then one has got to be able to differentiate between (visual) perception on the one hand and thought/language on the other via armchair reflection. So, perhaps Cohen thinks the following: Armchair reflection cannot distinguish between thought/language on the one hand and perception on the other. So, deciding whether ordinary perceptual illusion cases occur should be left to empirical inquiry. Science may teach us that the

only ordinary color “illusions” that occur are those of thought/language. Thus, the intuition for Illusion should not be trusted and so neither the one for P-Incompatibility.

Cohen cannot even accommodate ordinary error in color thought/language. So this argument is not going to help him. Regardless, the argument is a poor attempt to explain away the relevant intuitions. It is unbelievable that armchair reflection is unable to distinguish between thought/language and perception. People can easily distinguish between what they are saying/thinking on the one hand and what they are perceiving on the other. A world in which people could not do this would be a world in which people could not distinguish between thinking about/talking about a unicorn on the one hand and perceiving a unicorn on the other. Therefore, armchair reflection is able to distinguish between thought/language on the one hand and perception on the other. Empirical enquiry is not needed. One may reply that it is not so obvious philosophically where thinking ends and perceiving begins, but whether there are philosophical thought experiments in which people cannot easily distinguish thought from perception is irrelevant to whether the argument being considered works. Our intuitions about Illusion and P-Incompatibility are not based on these hard cases but everyday experience.

Cohen seems to appeal to an analogy with acceptability judgments in order to support what I take to be his claim that armchair reflection cannot distinguish between thought/language on the one hand and perception on the other. He says the following:

By way of analogy, consider what the linguist says about acceptability judgments. It is reasonable to insist, on the basis of considering your own reactions to the cases, that *the bulldogs fight* is acceptable and that *the bulldogs the bulldogs the bulldogs fight fight fight* is unacceptable [...] But it is not reasonable to insist, on the basis of considering

your own reaction to the case, that the unacceptability of the latter string is due to its failure to conform to the grammar of the language in particular. On the contrary, the standard story goes, acceptability judgments are the result of the interaction of the grammaticality faculty with other components in the cognitive system [...], and it is up to systematic empirical inquiry, as opposed to armchair consultation of intuitions, to dole out the labor of explaining the phenomena. (2007, p. 349)

This analogy cannot provide the needed support. Cohen may be right that it is unreasonable to insist that the unacceptability of the second string is due to the grammar of the language. Perhaps armchair reflection cannot easily distinguish between a sentence being ungrammatical and its having other problems. If so, there is good reason not to trust our intuitions that the relevant string is ungrammatical in particular. Regardless, there is a strong disanalogy between reflection on the grammaticality of sentences and reflection on perception. Being able to tell ungrammatical sentences from grammatical ones is a difficult task that requires a lot of training. Even university students sometimes fail to write grammatically. Conversely, being able to differentiate thought/language on the one hand from perception on the other is something that if learned at all, is learned at a young age. So, the analogy fails to support the claim that armchair reflection cannot distinguish between thought/language on the one hand and perception on the other. People can at least distinguish between these two things in the everyday cases on which the relevant intuitions are based. Sane, undrugged people, for example, do not normally mistake their thoughts/talk about unicorns for perceiving unicorns.

Conclusion

I have been examining whether Cohen's "relationalist treatment" of ordinary perceptual illusion can succeed. I first focused on distilling Cohen's treatment (section 1). I then argued that Cohen's treatment is incompatible with his argument from perceptual variation and his basic arguments for the first premise of his argument from perceptual variation (section 2). Finally, I looked at whether Cohen's basic arguments can be modified to avoid said incompatibilities and at an attempt to explain away our intuitions (section 3). Most generally, I have shown that Cohen's "relationalist treatment" has killed his patient.

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