

A Critique of Cohen's Relational  
Theory of Color

by

Rachel Myers, B.A.

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Approved

Edward Wilson Averill,  
Committee Member

Allan Hazlett,  
Chair

Francesca Di Poppa,  
Committee Member

John Borrelli  
Dean of the Graduate School

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## TABLE OF CONTENTS

<b>ACKNOWLEDGMENTS</b> .....	<b>ii</b>
<b>ABSTRACT</b> .....	<b>iii</b>
<b>1. INTRODUCTION</b> .....	<b>1</b>
1. The Color Variation Argument .....	1
2. A Relational Account of Color .....	5
3. Relationalism’s Accomplishments .....	6
4. Illusions and Causation in Relationalism .....	7
5. Color Agreements, Constancy, and Categorization .....	8
<b>2. PHENOMENOLOGY OF RELATIONALISM</b> .....	<b>11</b>
1. Intentionality in Perception .....	11
2. Perception is Intentional .....	13
3. Intentional Relational Colors, Visually Presented .....	14
4. Relational Colors are <i>Not</i> Visually Presented .....	16
5. Visual Experience: A Non-intentional Understanding of ‘Looks’ .....	18
6. Sense-Datum’s Accomodation of Relational Colors .....	21
<b>3. CIRCULARITY IN RELATIONALISM</b> .....	<b>22</b>
1. Cohen’s Response to Circularity .....	22
2. Boghossian and Velleman’s Argument Against Circularity .....	25
3. Relationalism’s Incompleteness .....	26
4. Completing the Relation with a Biconditional .....	26
<b>BIBLIOGRAPHY</b> .....	<b>29</b>

## ABSTRACT

Jonathan Cohen's relational theory of color defines color as a relation between an object, a subject and the viewing conditions, overcoming color-physicalism's anthropocentric conclusion that only some human visual systems have veridical color vision. According to relationalism, (almost) all perception is veridical. But relationalism faces two intractable problems that makes relationalism an untenable theory of color.

First, visual experience presents a tomato as being intrinsically colored, red, rather than relationally colored, "red for me in these conditions." Relatedly, any theory of color must account for how color causes our sensuous experience of color. Relationalism both mistakes our sensuous experience of color and fails to explain how relational colors fit into the causal structure of the world.

Secondly, in defining the relationship between an object's being red and looking red to an observer, relationalism specifies only that "if  $x$  looks green to  $S$  in  $C$ ,  $x$  is green for  $S$  in  $C$ ." Relationalism must therefore provide an independent account of what it is for an object to look green. Without an independent account it fails to pick out the specific mental events meant by "looks green." Because there are no illusions in relationalism, it's also true that "If  $x$  is green for  $S$  in  $C$ , then  $x$  looks green to  $S$  in  $C$ ." But this produces a regress problem. In light of these two problems, relationalism cannot be the correct account of color.

## CHAPTER 1

### INTRODUCTION

Jonathan Cohen's relational theory of color defines color as a relation between an object, an observer and conditions of observation. It is the thesis of this paper that relationalism is untenable in light of the phenomenology relationalism implies, as taken up in Chapter 2, and the unavoidable circularity relationalism faces in picking out which objects are red, the subject of Chapter 3. This chapter introduces Cohen's form of color relationalism. Section 1.1 introduces his argument from color variation, and his relational account of color is given in Section 1.2. Section 1.3 explains the strengths of a relational account of color, and Sections 1.4 and 1.5 explain minor problems of relationalism that can be accommodated by relationalism.<sup>1</sup>

#### **1. 1. The Color Variation Argument**

Different observers have different experiences of color when they observe the same object in the same lighting conditions.<sup>2</sup> For example, as a pigeon and I observe a uniformly colored flower in daylight, significant differences between my visual system and the pigeon's<sup>3</sup> cause what are plausibly different mental experiences of sensuous color

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<sup>1</sup> In 2003, Cohen offered a functionalist account of color, but he intends relationalism to be compatible with both functional and dispositional accounts. I occasionally refer to Cohen's functionalist account, not because his functional claims are binding on relationalism, but because he addresses issues, such as circularity, in the functionalist account that are neglected in the relational account.

<sup>2</sup> My explanation of the color variation argument is based on Cohen, Jonathan, "Color Properties and Color Ascriptions: A Relationalist Manifesto," *The Philosophical Review*, Vol. 113, No 4 (October 2004.) 454-457 and 462-469.

<sup>3</sup> The three types of cone cells in my eyes recognize short, medium, or long wavelengths, greatly reducing the information my eyes collect from the light. Pigeons have a slightly finer-grained discrimination of colors because their four types of cone cells collect and compare a little more information from the light.

when we look at the flower.<sup>4</sup> Color variation also occurs within a species due to smaller variations between visual systems and within an individual's own experience due to variations in the viewing conditions. Such disagreements about color guide the development of relationalism.

Faced with cases of perceptual variation, a color theory must interpret veridicality of perception in one of three ways.

1. Only one of the perceptions is veridical, and the other is wrong.
2. Both perceptions are veridical.
3. Neither perception is veridical.

Perception itself only presents a model of the world, but doesn't indicate the veridicality of a particular experience. When experiences differ, we cannot appeal only to the experiences themselves to establish if perception is veridical. Cohen discounts the first option because it's unnecessarily stipulative to judge the veridicality of qualitatively similar experiences differently.

Attempts to privilege certain perceivers fail. Smart, Averill, and Byrne and Hilbert appeal to normal human perceivers to define the color of objects,<sup>5</sup> but the many types of variation even among the human population make it impossible to define a what "normal" means. Even if "normal" could be defined, it would, by Cohen's lights, be

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<sup>4</sup> Although we can't know as much about a pigeon's experience of sensuous color, we can know *something* about it. Because they respond differently to surfaces that appear to most humans as the same color we can guess that they experience colors that are novel to our own experience.

<sup>5</sup> Averill and Byrne and Hilbert notably address the problem of defining normal perceivers. Averill, Edward Wilson, "Color and the Anthropocentric Problem," *Readings on Color: Vol: The Philosophy of Color*, eds Byrne, Alex and Hilbert, David, MIT Press: Cambridge, MA. 1997. 11-32. Reprinted from *Journal of Philosophy* 82 (1985) 281-304. And Byrne, Alex and Hilbert, David, "Color Realism and Color Science" URL = < <http://mit.edu/abyrne/www/ColorRealism.html>>.

unprincipled to consider only the normal perceptions veridical.<sup>6</sup> If, for example, normal were to mean a trichromat with defined sensitivities for each type of cone cell, the definition would rely on the contingent fact that a majority of people happen to have that particular type of visual system. Mass micro-surgery could change the visual systems of the population's majority, changing which perceptions are "normal."

Attempts to privilege certain viewing conditions on the basis of principle rather than stipulation also fail. Reduction tubes are black, matte tubes used to view objects in isolation from surrounding objects, and viewing objects through reduction tubes seems to be a promising viewing condition to prefer, because they eliminate the examples of intrapersonal color variation that Cohen offers.<sup>7</sup> But contrast colors, those colors such as brown and dark purple that can only be seen when lighter objects surround them, are not visible through reduction tubes, and some objects cannot physically be viewed through reduction tubes. Privileging the viewing conditions through a reduction tube entails that contrast colors are illusions and some objects that normally seem colored have no determinate color. Preferring the perceptions through reduction tubes is only to stipulate that fully black background is necessary for veridical perception; it makes no reference to principle.

Because there's no principled way to decide which observers have veridical perceptions, only the second and third options – both perceptions are veridical or neither perception is veridical – are metaphysically well-founded.

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<sup>6</sup> Byrne and Hilbert don't consider it unprincipled to privilege certain perceptions; the principle is that observers who accurately observe the real colors of objects will be privileged. The problem then becomes an epistemological one of how do we know who accurately perceives colors. See the discussions of unique green and the anthropocentrism of physicalism. "Color Realism and Color Science" URL = <<http://mit.edu/abyrne/www/ColorRealism.html>>.

<sup>7</sup> Cohen, Jonathan, "Color Properties and Color Ascriptions: A Relationalist Manifesto," *The Philosophical Review*, Vol. 113, No 4 (October 2004.) Figures 1, 2, and 3.

Cohen considers the third option that neither perception is veridical unnecessarily revisionist.<sup>8</sup> It implies that nothing is colored as it seems in perception, and that most of our normal-language color attributions of color are wrong. Cohen therefore concludes that all perceptions of color must be right. Yet there's reason to be suspicious of his reasoning. Though he dismisses projectivist accounts because they don't accord with natural language, there's no reason to think that natural language accurately reflects a complex metaphysical issue requiring consideration and argument. If pre-theoretic concepts of color reflected in natural language accurately described color, the metaphysics of color wouldn't require philosophical enquiry. For that reason, according with natural language is not a merit of a color theory.

Also, although Cohen doesn't acknowledge this, if relationalism is true, most of our normal-language color attributions, which don't describe colors as relational, are false. The only argument he offers against projectivism is also an argument to which relationalism is susceptible. Therefore Cohen's master argument for relationalism only succeeds in establishing that we should not privilege one perception's veridicality over another; it does not establish that all perceptions are veridical.

The color variation argument that supports relationalism is not deductive and not valid, but Cohen treats it as a *reductio* of an objectivist theory of color, according to which colors are objective physical properties of objects. The intrinsic properties of an observed object, such as its spectral reflectance, are unchanged, but the sensuous experience changes with different observers. Unless an objectivist theory can explain

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<sup>8</sup> Ibid, 462-463.

why the same property causes different experiences, objectivism cannot be the correct theory of color.

## **1. 2. A Relational Account of Color**

According to relationalism, a color is defined by a unique relation between an observer's visual system, the object observed, and the viewing conditions, because only by relativizing color to the observer and conditions can relationalism conclude that all perceptions are veridical. The uniformly colored flower has at least two color properties, the one I see and the one the pigeon sees, and although more colors are not *manifested*, the flower has arbitrarily many more color properties for all the possible combinations of observers and conditions.<sup>9</sup>

Relational colors are not intrinsic properties of objects, like the size or shape of an object. Objects alone don't have colors; if there were no possible observers, objects would have no colors. Because colors are mind-dependent in the sense that a change in the perceiver causes a change in color,<sup>10</sup> there's no way to define colors independently of their appearance. Cohen relates the appearance of colors to color properties this way: "If  $x$  looks green to  $S$  in  $C$ ,  $x$  is green for  $S$  in  $C$ ."<sup>11</sup> He doesn't explain what it means for an object to look green, and this omission is taken up in Chapter 3.

An essential step in Cohen's argument is that there's no principled way to privilege some color experiences over others. In cases of disagreement about properties

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<sup>9</sup> Cohen distinguishes between actual and possible color properties of an object. Any object has as many possible color properties as possible observer, but at any time "occurrently manifests" only as many colors as there are actual observers. See Cohen, Jonathan, "Color Properties and Color Ascriptions: A Relationalist Manifesto," *The Philosophical Review*, Vol. 113, No 4 (October 2004.) 459.

<sup>10</sup> Mind-dependence is based on the version in Averill, Edward Wilson, "Toward a Projectivist Account of Color," *The Journal of Philosophy*, Vol CII, No. 5 (May 2005.) 217.

<sup>11</sup> Cohen, Jonathan, "Color Properties and Color Ascriptions: A Relationalist Manifesto," *The Philosophical Review*, Vol. 113, No 4 (October 2004.) 463

defined independently of perception we have reason to consider some perceptions veridical rather than others. For example, the principled reason to prefer the perception of a square that looks like a square rather than the perception that looks like a trapezoid is that that one experience correctly reflects the properties of the object but the other doesn't. We know this because shapes are defined independently of their perception. But in the case of color, we have no definition independent of perception, and therefore, "there is no well-motivated, independent, and non-arbitrary criterion that makes one of the variants correct at the expense of the others."<sup>12</sup>

Cohen intends color-relationalism to show the relativism of colors that all theories of colors should explain, rather than provide a full theory of color itself. For that reason, relationalism is compatible with both functional accounts and dispositional accounts of color. According to a dispositionalist account, color is the dispositional property of objects that causes the objects to appear red. According to a functionalist account of color of the kind Cohen offers separately from relationalism, color is the property that causes the dispositional property of objects to appear red. Both these accounts can accommodate the mind-dependence of colors that the color variation argument suggests.

### **1. 3. Relationalism's Accomplishments**

When asked to select the green color chip that appears neither bluish nor yellowish, people select different color chips. Relationalism can account for why different people see different colors as uniquely green. Cohen argues that there's no principled way to decide which color chip is uniquely green; rather color,  $L_1$ , is unique green to subject,  $S_1$ , in conditions,  $C_1$ , while color,  $L_2$ , is unique green to subject,  $S_2$ , in

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<sup>12</sup> Ibid, 461

C<sub>1</sub>.

Relationalism isn't anthropocentric. Color physicalism, the theory that color is a physical property of the surface of objects relies on normal human observers to classify the spectral reflectances that define colors. It follows that the visual experiences of non-human animals are color illusions similar to but distinct from veridical color experience. Relationalism avoids anthropocentrism: all<sup>13</sup> visual perceptions of humans and other animals are considered veridical color experiences.

Relationalism avoids bias against non-standard perceivers. Mohan Matthen's relational account of color considers only visual systems that distinguish light by wavelength to have color vision, even if the phenomenal experience that results is identical to that of a visual system that distinguishes only intensity of light.<sup>14</sup> Here too, relationalism has eliminated the problems other theories create when they constrain which perceivers have veridical color vision.

#### **1. 4. Illusions and Causation in Relationalism**

According to relationalism, an object *is* green to a visual system if the object *looks* green to the visual system. It follows that it's impossible for an object to look green to a visual system but actually be blue to a visual system – there are no color illusions. But Cohen stipulates that some (non-actual) perceptions *are* color illusions:

For example, consider the telekinetically chromatic tomato: in addition to its ordinary capacity to look red, this tomato has a surface property that directly (that is, without retinal stimulation of any kind) affects visual cortices of perceivers in such a way as to

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<sup>13</sup> Fore carefully, all visual perceptions that result from non-deviant causal chains. See Ibid, note 41 and discussion of it in section I. 4. of this paper.

<sup>14</sup> Matthen, Mohan, "The Disunity of Color," *The Philosophical Review*, Vol 108, No 1. (Jan 1999). 47-84.

produce in them a green appearance.<sup>15</sup>

By stipulating that some causal chains cause color illusions rather than veridical color perception, Cohen infers, though not explicitly, that a specific type of causal chain is necessary for veridical color experience. The causal chain that produces sensuous experiences of color is therefore relevant to the veridicality of the experience.

But it's not clear from Cohen's account of relationalism how colors fit into the causal structure of the world, what sort of causal powers these complex color-relations have. Although *objects* have identifiable causal powers, *visual systems* have causal powers, and *lighting conditions* have causal powers, relational colors themselves don't cause anything. There's no obvious sense in which relational colors fit into the causal structure of the world. Because it's widely agreed that color *causes* perception of color, that relational colors have no causal power is a problem for relationalism. Were we to assume that relational colors *do* have causal powers, it needs to be specified *which* causal chains produce illusions and which chains produce veridical perceptions.<sup>16</sup> Because the telekinetically chromatic tomato looks green to a visual system, it *is* green to that visual system, and that telekinetically caused colors are illusory is an undefended stipulation.

### **1. 5. Color Agreements, Constancy, and Categorization**

Because color is a relation between an object, perceiver, and conditions, two objects that are perceptually indistinguishable to the same observer do not share the same color; they're in different relations and so have different color-relations. Yet Cohen

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<sup>15</sup> Cohen, Jonathan, "Color Properties and Color Ascriptions: A Relationalist Manifesto," *The Philosophical Review*, Vol. 113, No 4 (October 2004.) note 41.

<sup>16</sup> Averill has commented that "the reason that Cohen has not shown how colors fit into a naturalist account of the world is that he has not shown how "look green" fits into the world's causal structure." I take this to be the right.

relies on color agreement and disagreement in his color variation argument and account of color constancy.<sup>17</sup> These cases of color agreement where objects seem to have the same color are problematic for Cohen. He can establish color agreements by stipulation,<sup>18</sup> but he's given good reason against stipulating.

Some properties are known by perception alone, such as the relative location of an object. Other properties are not known only by perception, but are known by reasoning about our perception, such as how high off the ground my eyes must be to create my experience.<sup>19</sup>

Color constancy, attributing the same color to an object despite perceptible differences, are also problematic for relationalism. Cohen offers the example of a coffee cup of uniform intrinsic surface properties that's partially in sunlight and partially in shadow, and concludes that the cup is manifesting two different colors; "the regions are obviously discriminable, and it is hard to say how they are discriminable except in respect of something like their color."<sup>20</sup> He concludes that color agreements are counterfactual analyses of an object's color in changed conditions; "the judgment is that, although the sunlit region looks different (in respect of color) from the region in shadow, the two regions would look the same (in respect of color) were they both viewed under sunlight."<sup>21</sup> This construal misunderstands that color constancy occurs in perception – I *see* the object as uniformly colored – rather than in post-perception reflection on the ways my perceptions could change in different conditions.

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<sup>17</sup> Averill recognized that Cohen relies on color agreement and disagreement to explain color constancy.

<sup>18</sup> *Ibid*, 484-486. I take Cohen's homogeneity to be the same case as color agreement.

<sup>19</sup> Here I disagree substantively with both Cohen and Averill who claim that I know by perception alone that the perception is *my* perception rather than another's. This subject is addressed more fully in Chapter 2.

<sup>20</sup> *Ibid*, 457.

<sup>21</sup> *Ibid*, 460.

If attributing the same color to an object in spite of lighting differences is an intellectual exercise as relationalism characterizes it, it's presumably impossible for non-human perceivers, such as a bee, to perform this exercise. According to Cohen's relationalism, a bee seeing a flower, is unable to identify the entire flower as a uniform color despite differences in lighting, because the bee, I assume lacks the intellectual capacity for counterfactual analyses. If, however, color constancy occurs in perception rather than as a post-reflection analysis, it's possible to account for the plausible case that the bee sees constant colors despite lighting variation.

Color matching is the ability to identify color chips as having either colors that are perceptually indistinguishable or perceptually distinct colors. Classification is the ability to judge a range of shades as the same color; maroon, cheer red, and fuchsia are all red, for instance. A surface with uniform intrinsic surface properties in gradually changing light exhibits many different shades, each of which we could *match* to a different color chip. But rather than judging the object to have many different colors, we normally judge it to be uniformly colored, despite the differences in lighting. In doing so, we classify colors.

Cohen's form of relationalism makes all color attributions on the basis of color matching rather than a combination of color matching and color classification. As a result, his theory is unable to account for cases of classification occurring in perception. Although this creates unnecessary problems in the current explanation, relationalism could easily adopt a view of perception that includes classification. I don't consider the lack of color classification a serious problem for relationalism.

## CHAPTER 2

### PHENOMENOLOGY OF RELATIONALISM

According to relationalism, “if  $x$  looks green to  $S$  in  $C$ ,  $x$  is green for  $S$  in  $C$ ”<sup>22</sup> and Cohen anticipates the objection to relationalism that colors are not presented as relational in visual experience. In Cohen’s formulation of the objection, “the expression ‘looks’ (when it appears in contexts like ‘ $x$  looks yellow’) should be understood intentionally – that it should be understood in terms of the properties that are visually presented.” If relationalism is incompatible with an intentional understanding of ‘looks,’ relationalism must explain how a non-intentional understanding of ‘looks’ makes sense of visual experience. Cohen’s concludes that relationalism is compatible with an intentional understanding of ‘looks’ though he prefers a non-intentional understanding of ‘looks.’ This section examines the problems relationalism faces if ‘looks’ is understood intentionally, non-intentionally, and why Cohen’s response to the phenomenological concerns doesn’t address the real phenomenological problem for relationalism.

#### **2. 1. Intentionality in Perception**

Intentionality is a property that words, propositions, pictures, and mental states, have of being directed at, representational of, descriptive of, or *about* something. The proposition “the lemon is yellow” is intentional because it *describes* the lemon. The mental state of seeing a lemon as yellow (one might pre-theoretically assume) is intentional because it *represents* the lemon. Perception is intentional if it represents objects in the world. Perception that represents the cat as being on the mat is intentional

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<sup>22</sup> Cohen, Jonathan. “Color Properties and Color Ascriptions: A Relationalist Manifesto,” *The Philosophical Review*, Vol. 113, No 4 (October 2004.) 463.

because it represents of a state of affairs in the world. A non-intentional mental state is one that doesn't represent the world.

Representing objects in the world doesn't require that the perception have the *same property* as objects in the world. That my visual system picks out an object, say, a lemon, and attributes to it a property, say, of being yellow, doesn't mean that there is a lemon *in my visual system*. Nevertheless mental states represent objects that are unlike themselves.

The motivation behind the objection that 'looks' is intentional can be understood in two ways. First, and as Cohen presents it, 'looks' is the language we use to ascribe color properties to objects, and normal-language color attributions of the form 'x is yellow' are deliberately trying to represent the world.<sup>23</sup> If a theory of color implies that color experiences are not representational, then the attribution "the lemon looks yellow" is strictly false though perhaps acceptable in informal, normal language. This formulation of why 'looks' should be understood intentionally rests on normal language having the right underlying metaphysics.

An alternative and stronger formulation of why 'looks' should be understood intentionally is that perceptions of color are *actually* representing something in the world. It doesn't matter what normal-language suggests perception is; perception is the function of the brain that represents reality and theories of perception should recognize this. This is the stronger form of intentionality, and this, rather than the language-centered form, will be my focus.

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<sup>23</sup> Ibid, 478.

## **2. 2. Perception is Intentional**

Some properties I attribute in perception and others I attribute by reflection.<sup>24</sup>

Reflection is post-perception cognition sometimes about perception. For example, with perception alone I represent the relative heights of two men standing together and I would explain my perception by saying “David is taller than Ben.” I know from previous perceptual experience that Ben is taller than Michael. And upon reflection I could attribute to David the property of being taller than Michael.

‘Looks’ should be understood as representing objects in the world because that understanding best explains our phenomenological experience. The phenomenology of vision is of objects that have properties such as size, shape, and color, and when I describe that phenomenology with attributions such as “the lemon looks yellow” I mean to ascribe a color property to an object in the world, rather than to sometime like my visual field. This attribution of properties to objects occurs in perception rather than post-perception reflection.

In the case of mistaken representations, I falsely attribute properties to objects, such as mistaking a stick for a snake.<sup>25</sup> In these cases, ‘looks’ is used to represent the world, but it represents the world inaccurately. Cases of hallucinations don’t succeed in picking out objects and attributing properties to the objects. So although the person hallucinating thinks they’ve represented the world, they have not.

In other cases, experiences can mimic the phenomenology of perception but the experience is clearly not perception and not representational. The understanding of

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<sup>24</sup> “Reflection” as I use it is similar to the concept of “explanation” in Johnston, Mark, “How to Speak of the Colors,” *Readings on Color: Vol: The Philosophy of Color*, eds Byrne, Alex and Hilbert, David, MIT Press: Cambridge, MA. 1997. 137-176. reprinted from *Philosophical Studies* 69 (1992) 138.

<sup>25</sup> Thanks to Averill for this example.

'looks' should account for these as well. For example, if, by applying moderate pressure to my closed eyes, I produce color sensations, say of red with yellow dots, that mental state doesn't represent anything in the world. Similarly, if I look directly at the sun, when I look away, I may see an after-image, a red blotch in the center of my visual field without seeing a red *object* there. In ascribing the color red to the after-image, the normal meaning of a phrase like "x looks red" would be inappropriate, because although I see an after-image, I don't see it as an object; there's no x to ascribe the color to; I instead refer to my visual field.

An intentional, representational understanding of 'looks' isn't threatened by the phenomenology of after-images or pressure-induced visual experiences. These are visual experiences, but unlike perception, these visual experiences don't attribute properties to *objects*. They are hallucinations that don't delude us. We can understand 'looks' as representing the world and agree that some experiences similar to perception, like after-images, do not represent the world.

The sense data theory would not accept my claim that 'the lemon is yellow' is representational. It instead posits the existence of sense data that act as an intermediary between the world and our perception of the world. Accordingly, every color attribution is only strictly correct if it attributes color to a sense datum. Sentences like "the lemon looks yellow" are false because the sense datum looks yellow rather than the lemon.<sup>26</sup>

### **2. 3. Intentional Relational Colors, Visually Presented**

People don't experience or attribute *relational* colors to objects; therefore attributions of the form "x looks yellow to S in C" cannot be representational of objects in the world.

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<sup>26</sup> Huemer, Michel. "Sense-Data", *The Stanford Encyclopedia of Philosophy* (Spring 2004 Edition), Edward N. Zalta (ed.), URL = < <http://plato.stanford.edu/entries/sense-data/>>.

In anticipating this argument, Cohen explains that “the expression ‘looks’ ...should be understood in terms of the properties that are visually presented (478.)” Unless relational colors are visually presented, relationalism will fail to account for our phenomenology of perception.

Cohen prefers a non-intentional understanding of ‘looks,’ and this response is discussed in section f below. But he also argues that relational color properties *are* visually presented; perception represents the world as having relational properties. This response is addressed in sections 4 and 5 below. If colors are presented in perception as relational rather than non-relational, this amounts to not seeing the lemon as *yellow*, but as *yellow to me in these conditions*. That relational nature of colors is presented by perception is highly dubious.

Lots of properties are visually presented. Objects’ shapes, locations, and sizes (of objects that are neither too big nor too small for us to see well) are all visually presented. Of this (incomplete) list of properties, shape and size are intrinsic properties of objects. Location is a property known by visual presentation that is inherently relative. For example, my pen is above my bookmark. If A indicates the relationship “being above,” p stands for my pen, and b stands for my bookmark, the relational property is indicated by pAb. I know the location of my pen relative to my bookmark because I *see* both the pen and the bookmark and the relationship is presented in perception. When Cohen claims that a relational understanding of color is consistent with an intentional understanding of ‘looks,’ he claims that color properties resemble locational properties in being relative and known in perception.

Cohen offers the alternative that relational properties could be represented more

generally as “*yellow for visual systems pretty much like my own in viewing circumstances pretty much like those I typically encounter.*”<sup>27</sup> But this seems less plausible. I can reasonably know the viewing conditions I typically encounter, but I don’t know in which ways my visual system is similar to others around me – I certainly don’t know anything about others’ visual systems by simply perceiving the lemon.

The strength of relationalism is that it can account for the color perception of non-human animals. But it seems implausible that a bee, seeing a flower, represents the flower as “*pink for visual systems pretty much like my own in viewing circumstances pretty much like those I typically encounter.*” Explaining perception in terms that seem more intellectual than bees are plausibly capable of undermines the best argument in favor of relationalism.

#### **2. 4. Relational Colors are *Not* Visually Presented**

Polemically, visually presented relational properties of colors would *be obvious* to everyone with normal vision, as is everything else presented in perception. If relational colors are known by perception, Cohen’s argument from color variation would be obsolete. His argument would instead take the form of someone demonstrating that the pen is above the bookmark: He would say “This is a pen. This is a bookmark. Look and see for yourself that they stand in such a relation that the pen is *above* the bookmark.” He could rely on our visual experience to present the property to us. That Cohen gives an argument for the relational nature of colors indicates that the relational nature of color is

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<sup>27</sup> Cohen, Jonathan. “Color Properties and Color Ascriptions: A Relationalist Manifesto,” *The Philosophical Review*, Vol. 113, No 4 (October 2004.) 480.

known by *reason*, or what Johnston calls *explanation* rather than perception.<sup>28</sup>

If relational properties are visually presented, in other words known in virtue of what I see rather than reflection upon what I see, I must perceive all elements of the relationship. For example, I attribute to the pen the property of “being above the bookmark,” and I do so only on the basis of my visual experience.<sup>29</sup>

If relational color properties are visually presented, I would perceive the complete relation, including the viewer and conditions, and that requires that perception of *objects* include a perception of the *perceiver*. Cohen seems to have in mind a scenario in which I visually perceive the object and the conditions and include in perception the acknowledgement that the experience is my own.

*Perceiver* in this context refers to the visual system of a person rather than a person’s entire body; for instance, seeing my arm in my visual field isn’t what’s meant by seeing the perceiver in perception. In Cohen’s definition of color, S stands for the subject’s visual system because that’s what’s importantly different in each subject. It is sometimes possible that one’s visual system be seen in perception. For example, in some eye exams light hits the eye at such angles that the blood vessels within the eye are visible. This is a case of seeing the perceiver in perception; the visual system is both the subject and the object of perception, and such cases are far rarer than Cohen seems to think.

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<sup>28</sup> Johnston, Mark, “How to Speak of the Colors,” *Readings on Color: Vol: The Philosophy of Color*, eds Byrne, Alex and Hilbert, David, MIT Press: Cambridge, MA. 1997. 137-176. Reprinted from *Philosophical Studies* 69 (1992) 222.

<sup>29</sup> Averill argues that my visual experience includes myself. If the pen were to the left of the bookmark, it would be left of the bookmark relative to me, and the relationship would therefore be triadic rather than dyadic. It’s not a problem for my argument against Cohen that I should be a reference point in the relational property “to the left of,” but I use another example for two reasons. First, this simplifies the example. Secondly, I maintain that the relational property “to the left of” is known by perception alone, and it’s by reflection that we know the observer must be a reference point. To avoid conflating relational properties known in perception with the separate issue of if the observer is also observed in perception, I use the example ‘above,’ which I hope avoids the problem.

In every day perception, outside eye exams, acknowledgement of the perceiver comes from reflection on perception but is not *in perception*. For example, if I perceive an object in the world, and reason that I had to be present in order to perceive the world. Even if this calculation is nearly instant, it is the result of reflection on perception rather than perception itself. I see things at a particular angle or distance, but I don't recognize myself only from perception of something at a certain angle. Understanding that my visual system must be at a particular distance from an object to explain my perception is a function of reflection rather than perception. I see a coffee cup as within my arm's reach<sup>30</sup>, but because the subject here means "the visual system of the subject," my arms are not part of "me" in the relevant sense.

It is certain that perceivers do not perceive their own visual systems; their experience appears to represent the world rather than the world *and their place in it*. Viewing conditions are similarly not contained in perception. Although we are sometimes aware of strange viewing conditions, we know this also through reflection rather than perception. When I see an object that normally appears green as blue, I *reason* that the lighting conditions must be yellow rather than normal, white sunlight. I conclude that relationalism so misrepresents the phenomenology of perception that it's impossible that we should *represent* the world as having relational properties. An intentional understanding of 'looks' is therefore unavailable to relationalism.

## **2. 5. Visual Experience: A Non-intentional Understanding of 'Looks'**

Cohen considers the intentional understanding of 'looks' defended above "a substantive theoretical assumption that the relationalist may be inclined to reject."

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<sup>30</sup> This example comes from comments made by Averill.

Christopher Peacocke argues for a non-intentional understanding of ‘looks,’ according to which the lemon has the property of being yellow (understood as intrinsic surface properties of objects) and I *represent* the lemon as yellow’; objects themselves have the property of being yellow, but the related visual experience has the separate property of being yellow’. Cohen rejects Peacocke’s account because it relies on standard perceivers in standard viewing conditions, and this makes Peacocke’s account vulnerable to color variation arguments: there’s no metaphysically well-motivated way to specify the standard perceivers or conditions.

Cohen instead endorses a non-intentional understanding of ‘looks,’ according to which, “*x looks red to S in C just in case, by visually attending to x in C, S is appropriately caused (in C) to have an experience of red,*” and an “*experience of red is a type of mental state of subjects that is the typical effect of attending to red things.*”<sup>31</sup> Understanding ‘looks’ in terms of a mental experience is non-representational because when I apply pressure to my eyes I have an *experience* of red, and so something (my visual field, sense-datum, or something else) *looks* red without representing anything about the world. Applying pressure to my eyes produces an experience like an illusion in the sense that it creates sensations where there’s nothing in the world it’s representing. But these pressure-induced sensations, along with after-images, are a type of illusion that doesn’t deceive us; we don’t think there *are* red spots floating in the world we after see the sun.

According to Cohen’s experience account, no color experience represents the world; all perception is non-intentional. He acknowledges a causal relation between red objects

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<sup>31</sup> Italics are his. Cohen, Jonathan, “Color: A Functionalist Proposal,” *Philosophical Studies* 113. 2003. 10.

and red experiences (an “experience of red is ... the typical effect of attending to red things”) but denies that the mental experience of color itself represents the world. When I attend to a ripe tomato in sunlight, I experience red, but, so says the non-intentionalist, the red is not *about* or *of* the tomato.

Peacocke’s projectivist theory and sense-datum theory claim that all perceptions of color are non-representational,<sup>32</sup> but only within a substantive theoretical framework. Cohen, by contrast, posits no theory to explain how it is that experiences that seem representational are mistaken. Johnston’s revelation point is that visual experience seems to reveal that redness is an intrinsic property of the tomato,<sup>33</sup> and Cohen has no theory to explain how the revelation point is wrong.

Cohen concludes only on the basis of our visual experiences, that the mental state typical of attending to a ripe tomato is *not* representational of the tomato. Cohen doesn’t answer the question that follows: If such mental states are not about objects in the world, what are they about? Cohen’s non-representational account of ‘looks’ fails, not because it’s wrong or inconsistent, but because the account is explanatorily vacuous.

A non-intentional account is still available to Cohen, and because colors are not perceived relationally, if he maintains that colors are relational, a non-intentional account is the only account available. Another non-intentional account is possible, but the experience account he’s provided is doesn’t explain enough to be considered a robust account of perception.

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<sup>32</sup> As I said before, I take it for granted that some mental states, such as after-images or pressure-induced colors are non-representational. The controversy is if some mental states *are* representational.

<sup>33</sup> Johnston, Mark, “How to Speak of the Colors,” *Readings on Color: Vol: The Philosophy of Color*, eds Byrne, Alex and Hilbert, David, MIT Press: Cambridge, MA. 1997. 137-176. reprinted from *Philosophical Studies* 69 (1992) 138.

## **2. 6. Sense-Datum's Accommodation of Relational Colors**

Sense-data theory interprets 'looks' non-intentionally and offers a substantive theory that explains non-intentional perception. Sense-data theory is the sort of theory Cohen needs to explain perception of relational colors.

Sense-data theory claims that our visual experiences make us directly aware of mind-dependent sense data, of redness for example, and only indirectly aware that the tomato looks red.<sup>34</sup> Because relational colors are relative to the perceiver, relational colors are mind-dependent, that is, a change in the mind causes a change in the color.<sup>35</sup> Sense data theory could therefore accommodate relational colors, and provide Cohen with a robust, non-intentional theory of perception that he currently lacks. It would also make relationalism vulnerable to all the criticisms of sense-data theory.

**RELATIONAL COLORS CANNOT BE ACCOMMODATED WITHIN AN INTENTIONAL THEORY OF PERCEPTION BECAUSE THE PHENOMENOLOGY OF COLORS REPRESENTS COLORS AS INTRINSIC RATHER THAN RELATIONAL. A NON-INTENTIONAL THEORY OF PERCEPTION IS THEREFORE REQUIRED TO GIVE A FULL ACCOUNT OF RELATIONALISM, BUT THE NON-INTENTIONAL ACCOUNT COHEN HAS GIVEN IS INADEQUATE TO THE TASK. COHEN REJECTS MORE SUBSTANTIVE NON-INTENTIONAL THEORIES, SUCH AS PEACOCKE'S, BECAUSE THEY ARE VULNERABLE TO THE COLOR-VARIATION ARGUMENT. IF COHEN DOESN'T ASCRIBE TO AN ACCOUNT OF 'LOOKS' SUCH AS THE ONE PROVIDED BY SENSE DATA THEORY BECAUSE HE'S UNWILLING TO ACCEPT THE PROBLEMS ASSOCIATED WITH IT, NO ACCOUNT OF 'LOOKS' IS AVAILABLE TO COHEN. IF RELATIONALISM MAKES IMPOSSIBLE A ROBUST ACCOUNT OF 'LOOKS' IT CANNOT BE THE RIGHT THEORY OF COLOR.**

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<sup>34</sup> Huemer, Michel. "Sense-Data", *The Stanford Encyclopedia of Philosophy* (Spring 2004 Edition), Edward N. Zalta (ed.), URL = < <http://plato.stanford.edu/entries/sense-data/>>.

<sup>35</sup> This understanding of dependence comes from Averill, Edward Wilson. "Toward a Projectivist Account of Color," *The Journal of Philosophy*, Vol CII, No. 5 (May 2005.) 217.

## CHAPTER 3

### CIRCULARITY IN RELATIONALISM

Defining color properties is different than defining geometrical properties, such as being a square, or biological properties, such as being an ostrich, because a square and an ostrich can be defined independently of how they look. For example, from a certain angle, a square might look trapezoidal, yet that doesn't make the square a trapezoid. But there exists no well-motivated way of defining colors independently of how they look. Therefore, the relationship between being red and looking red must be specified, such that we can pick out which mental states are meant by 'look red,' and we the necessary and sufficient conditions for something to be red.

If the relationship is defined as "x is red if and only if x looks red," then the account is circular because it defines being red in terms of looking red. Cohen claims this sort of circularity is innocent and minimally informative; his claims are addressed in Section 3.1. Section 3.2 contains Boghossian and Velleman's claim that an independent account of what 'looks green' means must be given if we are to succeed in picking out the mental states meant by 'looking green.' Section 3.3 takes up the incomplete relation between being 'looking red' and 'being red' that Cohen offers in his relational account, and the problems relationalism faces in completing the relation is the subject of Section 3.4.

#### **3. 1. Cohen's Response to Circularity**

In his functionalist account of color, Cohen offers a circular definition of color and defends it as nevertheless explanatory and informative.

(A1) *red* is the property that disposes its bearers to look red....

(A2) *x looks red* to *S* in *C* just in case, by visually attending to *x* in *C*, *S* is appropriately caused (in *C*) to have an experience of red....

(A3) *experience of red* is a type of mental state of subjects that is the typical effect of attending to red things.<sup>36</sup>

This analysis fails explanatorily and informatively. Because ‘red,’ ‘looking red,’ and ‘experiences of red’ are defined in terms of one another, these analyses don’t explain the meanings of ‘red,’ ‘looking red,’ or ‘the experience of red’; the analyses are only helpful in showing the relation between concepts if I understand independently what ‘red,’ ‘looking red,’ and ‘the experience of red’ mean.

Cohen’s recognizes that his analyses aren’t complete and that “it may be that there is more to be said about the metaphysics of the mental state type in question.”<sup>37</sup> But he defends this omission as acceptable – because he’s offering a theory of the metaphysics of *color properties*, rather than a theory of the metaphysics of *color experience*.

His definitions are also uninformative because if one lacks a concept of red, one cannot learn the concept from his analyses. But he defends this feature by claiming we can teach people the meaning of red independently: “Thus, the uninformativeness of the chain of analyses will not prevent its use by those who can already identify red things (or things that look red, or experiences of red), and since these abilities can be given to those who lack it<sup>38</sup>, the chain can be used by them too.”<sup>39</sup> The chain of analyses is only useful

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<sup>36</sup>Cohen, Jonathan, “Color: A Functional Proposal,” *Philosophical Studies* 113. 2003. 11.

<sup>37</sup> Ibid, 14.

<sup>38</sup> He seems to mean we can give the ability to identify red things to children with normal perceptual ability rather than people unable to perceptually distinguish red things: “our ability to identify red things is grounded in ostension to local exemplars – that induction from ostensive exposure to red things (aided by

to people who already understand the meaning of red, looks red, or experiences of red; to those who don't need it.

Cohen makes a second defense of the analyses' un informativeness: We describe our mental events in terms of their representational content, by what they represent from the world, and the representational content of our mental experience might be the only way we have of describing mental experience.<sup>40</sup> For example, as I look at a flower, in expressing the content of my mental experience, I refer to the objects represented by my mental experience. This explains why experience of red is most naturally described in terms of red objects – because that's the only linguistic resource we have to describe it.

It's undeniable that people describe mental experience in terms of objects that mental experience represents, but that fact doesn't establish that this is the only description that can be given of the mental experience. If it is true that mental experience can *only* be described by describing the objects represented in mental experience, then there's no way to distinguish the two mental experiences of individuals representing the same object. The mental experiences are numerically distinct and probably qualitatively distinct, but the differences are not captured by Cohen's inter-referential analyses that explain mental experience in terms of the objects represented. He dismisses both the concerns of inadequate metaphysical explanation and the lack of informativeness from the language.

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cues including utterances of 'red', in the context of our desire to coordinate our linguistic and non-linguistic behavior with locally prevailing conventions) enabled us to identify at least one red thing, and that this gave us a way to break into the explanation I have proposed" (Ibid, 12.) Some people who can't perceptually distinguish red *cannot* be given the ability, underscoring the analyses' un informativeness.

<sup>39</sup> Ibid, 12.

<sup>40</sup> Ibid, 11.

### **3. 2. Boghossian and Velleman's Argument Against Circularity**

According to Boghossian and Velleman, dispositional accounts of color that define the property red as “Red [i.e., the property that objects are seen as having when they look red] =def a disposition to appear red under standard conditions”<sup>41</sup> either give a single meaning to ‘red’ on both sides of the identity, or a different meaning to each use of ‘red.’ If ‘red’ has the same meaning in both uses, then applying the definition to itself creates a regress and fails to pick out which things are red.

Claims can be circular but still true. For example, necessary truths of the form *x if and only if x*, are innocently circular, because although such claims are uninformative, they are true. *Being x* is a necessary and sufficient condition for *being x* though that claim won't help me recognize which things are *x*.

Biconditional statements that relate the property of ‘being red’ to the ‘appearance of red,’ such as “*x* is red if and only if *x* bears a disposition to look red,” are straightforwardly circular because they use *red* on both sides of the connective. Cohen argues that the circularity is innocent if uninformative or minimally informative,<sup>42</sup> but Boghossian and Velleman consider such biconditionals viciously circular: The regress it engenders, “*x* is red if and only if *x* bears a disposition to look to bear a disposition to look to bear a disposition to look red” never succeeds in picking out *which* mental events look red. Unless we know which mental experiences are under discussion, we can't use those mental experiences to describe the dispositional property of the object.

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<sup>41</sup> Boghossian, Paul A and Velleman, J. David, “Color as a Secondary Quality,” *Readings on Color: Vol: The Philosophy of Color*, eds Byrne, Alex and Hilbert, David, MIT Press: Cambridge, MA. 1997. 84.

<sup>42</sup> Cohen, Jonathan, “Color: A Functionalist Proposal,” *Philosophical Studies* 113. 2003. 10-11.

### **3. 3. Relationalism's Incompleteness**

Unlike Cohen's defense of color-functionalism which gives an account of color and defends it against charges of circularity, Cohen's explanation of relationalism gives only an incomplete account of color. In relationalism, Cohen relates being green to looking green by a material conditional: "If x looks green to a visual system, x is green for that visual system."<sup>43</sup> He offers no account of what it means to look green.

Perhaps it is modesty that prevents Cohen from completing the relation between being green and looking green. Because Cohen sees relationalism as a constraint on complete theories of color rather than a theory of color itself, he resists making substantive theoretical claims extraneous to relationalism itself, deferring instead to other theories of color to explain what it means for an object to look green. For example, a dispositional theory of color committed to the claim that *red is the disposition to cause red perceptions* might explain what it is to look red differently than a functionalist theory committed to the claim *that red is the basis of the disposition to cause red perceptions*. But relationalism, by asserting that red is a relation between an observer, and object, and lighting conditions, has already given a theory of color. But relationalism as a theory of color is incomplete because it gives no account of 'looking red.'

### **3. 4. Completing the Relation with a Biconditional**

Cohen declines to complete the relation between 'looking red' and 'being red.' This section is concerned with the consequences of completing the relation.

Use of the material conditional rather than the biconditional may have been an unintentional mistake, and 'looking red' should be defined in terms of 'being red.' The

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<sup>43</sup> Cohen, Jonathan, "Color Properties and Color Ascriptions: A Relationalist Manifesto," *The Philosophical Review*, Vol. 113, No 4 (October 2004.) 463.

physicalists Byrne and Hilbert object to defining looks red in terms of being red because they're committed to red being a physical property of the surface of objects, and sometimes red things will not look red (in non-standard conditions, for instance.) But this isn't a problem for relationalism. All it means to have a relational color is for an object to look a certain way to a visual system.

'Looking green' cannot be explained only in terms of 'being green' because objects have as many relational-color properties as there are possible observers/condition combination, and an object may be green to S in C even when the object isn't in the vicinity to S. In those conditions, x is green to S in C, but doesn't look green to S in C. An account could instead be:

(i.) If S perceives *x* in C then (*x* is green for S in C if and only if *x* looks green to S in C.)

Cohen seems committed to this because excluding perception that results from a deviant causal chain<sup>44</sup>, there are no color illusions.<sup>45</sup> Objects that are green for S in C will look green to S in C. If Cohen is committed to (i.) as I claim he must respond to the circularity that ensues. By defining two concepts 'looking red' and 'being red' in terms of one another, the account is circular and offers no new information to anyone who doesn't know what 'looking red' means. The account's not innocently circular as the definition "courage is the disposition to act with courage," which although only minimally informative, is nevertheless true. (i.) is the type of circular argument Boghossian and Velleman's criticize as viciously circular because it fails to pick out which mental states are being referenced.

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<sup>44</sup> Ibid, note 41.

<sup>45</sup> The point that because Cohen is committed to all perception being veridical, he should accept the material conditional (if *x* is green to S in C then *x* looks green to S in C) comes from discussions with Averill.

Further, applying (i.) to itself yields an explanation of ‘look’ foreign to our normal phenomenology of color: “x looks red to S in C if x looks like it looks red to S in C.” The normal appearance of objects is not to look like it looks like it is red; objects normally just look red.

To avoid this problem, the property that the object appears to have must be different than the property the object actually has. In Peacocke’s form of projectivism, objects look to have the property of red', and property of red causes the disposition to look red'. Because Cohen is committed to objects having and looking to have the same property, the projectivist solution to circularity is unavailable to his form of relationalism. Although the relational account of the relation between ‘looking red’ and ‘being red’ isn’t circular, it makes a non-circular account impossible, and so cannot be the correct account of color.

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