THE MYTH OF THE COMMON SENSE CONCEPTION OF COLOR[*]

Forthcoming in Åsa Wikforss and Teresa Marques (eds.), *Shifting Concepts: The Philosophy and Psychology of Conceptual Variability*, Oxford: Oxford University Press

Zed Adams[a] & Nat Hansen[b]

Abstract

Some philosophical theories of the nature of color aim to respect a "common sense" conception of color: aligning with the common sense conception is supposed to speak in favor of a theory and conflicting with it is supposed to speak against a theory. In this paper, we argue that the idea of a "common sense" conception of color that philosophers of color have relied upon is overly simplistic. By drawing on experimental and historical evidence, we show how conceptions of color vary along several dimensions and how even supposedly "core" components of the contemporary "common sense" conception of color are less stable than they have been thought to be.

Keywords: color, common sense, concepts, eliminativism, genealogy, metaphysics, realism, variation

1. Overview

In this essay, we challenge the very idea of a single, ahistorical, "common sense" conception of color, on grounds that beliefs about color vary along several different dimensions: they vary interpersonally, intrapersonally, and historically. We begin, in §2, by discussing the central role played by one way of thinking about the "common sense" conception of color in metaphysical debates about color eliminativism vs. color realism. That way of thinking holds that the "common sense" conception of color treats it as a non-relational property of objects, ontologically on par with shape or mass. We then, in §3, show how recent experimental investigations that evaluate that particular way of thinking about the "common sense" conception reveal interpersonal variation in how colors are conceived. In §4, we put pressure on the idea that conceiving of colors as non-relational is a stable component of the "common sense" conception of color by showing how there is intrapersonal variation in how colors are conceived, depending on what type of object is being considered, and on what intentional "frame of reference" one adopts. §5 discusses a recent genealogical argument (Chirimuuta 2015) that uses observations about historical variation in how colors are conceived to debunk the idea of an ahistorical, "common sense" conception of color. In §6, we discuss a more subtle conception of the

[*] This work was supported by an External Faculty Fellowship at Stanford University's Humanities Center. Thanks to Jake Browning, Yasmina Jraissati, and Mark Phelan's philosophy of mind class for comments.
[a] New School for Social Research: zedadams@gmail.com
[b] University of Reading: n.d.hansen@reading.ac.uk

"common sense" conception of color due to Johnston (1997), which holds that there are five "core beliefs" about color that we are "susceptible" to, simply in virtue of experiencing color and grasping ordinary color language. In §7, we argue against the idea that we are "susceptible" to these "core beliefs," on the grounds that there is substantial historical variation in the content of those beliefs. In §8 we conclude that the "common sense" conception of color, as it has been discussed by philosophers, is a myth.

2. The "Common Sense" Conception of Color in Color Metaphysics

The "common sense" conception of color is relevant for debates in color metaphysics because central arguments for color realism, as well as arguments for color eliminativism, begin from claims about how we ordinarily conceive of colors.[1] They then go on to argue either that such a conception is true of the world (for color realists), or that it is not (for color eliminativists).

> Color Eliminativism is the denial that physical objects have the colours that we attribute to them, in our everyday thought and talk: the visually conspicuous features that we naively and pre-reflectively attribute to physical objects. And Colour Realism (at least, in one form) is the natural opponent for eliminativism, is the denial of this denial. (Maund 2011, p. 363)

The eliminativist argument begins with a conceptual and semantic claim about "everyday thought and talk," specifically about the ordinary concept of color.[2] The claim is that we conceive of colors, and talk about them, as if they were intrinsic properties of objects. An intrinsic property of an object is a non-relational property, where shape and mass are exemplars of intrinsic properties. Eliminativists claim that in ordinary thought and talk, both colors and (e.g.) shapes are represented as being intrinsic, non-relational properties of objects:

> [O]ur dominant ordinary view gives [colors and shapes] much the same status" (Mackie, 1976, p. 16)[3]

The second step in the eliminativist argument is the claim that colors are not intrinsic properties of objects, because there is no role for such properties in modern scientific explanation. In contrast, other properties that are represented as intrinsic in ordinary thought and talk, like shape, do play a role in scientific explanation (see Mackie 1976, p. 18; Levine 2006, p. 276).

---

[1] This and the following section draw on material in Adams (2015), Chapter 1.

[2] See Maund 2011, p.363 for the "conceptual and semantic" characterization of the first step in the eliminativist argument.

[3] In this characterization of the "ordinary", or "commonsense" conception of color, some realists about color are in agreement with eliminativists. See, for example, Hilbert (1987, p.2): "Pre-reflective common sense is robustly realist about colors and does not distinguish color from other fundamental properties of external objects such as shape or weight. Our pre-reflective attitude towards colors takes them to be properties of the things they are seen to qualify, in just the same sense as the shape of an object is a property of it."

Combining these two steps produces the following argument for eliminativism:

Premise (i)	We ordinarily conceive of colors as intrinsic properties of objects.
Premise (ii)	Modern science has discovered that color is not an intrinsic property of objects.
Conclusion	Colors (as we ordinarily conceive them) do not really exist.

One prominent response to the eliminativist argument is to deny premise (i) by claiming that ordinary thought and talk about colors do not represent colors as being intrinsic properties of objects. Instead, this response involves the claim that the ordinary conception of color is *relational*, specifically that we conceive of colors as dispositions to produce certain kinds of visual experiences. Allen (2007, p. 137) characterizes this response to the eliminativist argument as follows:

> [P]roponents of this approach claim that the view of colour implicit in common sense is *already* the view that colours are mind-dependent dispositional properties. ... [T]his view has proved especially popular at Oxford, where in one form or another it has passed through successive generations of 'Oxford philosophers.' (Allen 2007, p.137)[4]

Allen dubs this rejection of eliminativism "Oxford Realism."[5] Here are two expressions of Oxford Realism:

> When Locke said that the secondary qualities were powers in things to produce sensations in us, he stated the facts correctly, but he did not realize that his statement was only an analysis of the plain man's use of secondary quality adjectives. ...When in ordinary life we say "The paper isn't really red," we always intend to imply that the paper has some other colour as a dispositional property. (Kneale, 1951, p. 123)

> A secondary quality is a property the ascription of which to an object is not adequately understood except as true, if it is true, in virtue of the object's disposition to present a certain sort of perceptual appearance: specifically, an appearance characterizable by using a word for the property itself to say how the object perceptually appears. Thus an object's being red is understood as something that obtains in virtue of the object's being such as (in certain circumstances) to look, precisely, red. (McDowell 1985, p.111)

The debate between Oxford Realists and eliminativists essentially hinges upon whether

[4] Allen himself does not adopt this approach to arguing against eliminativism.
[5] For a detailed discussion of the theoretical commitments of Oxford Realism, see Adams (2015, §1.2). For a broader history of Oxford Realism, see Travis and Kalderon (2013).

one accepts or rejects premise (i). In either case, however, the arguments for or against this premise draw upon considerations that are thought to derive from a "common sense" conception of color.

Eliminativist and others have argued for accepting premise (i) by invoking the "transparency" of color experience (see, e.g., McGinn 1996, pp.541-2), the phenomenon of color constancy (see, e.g., Allen 2007, p.145), the fact that we teach the meaning of color terms by pointing to objects (see, e.g., Gert 2006, p.568), the possibility of imagining colors that we are constitutionally unable to perceive (such as "killer yellow") (see, e.g., Broackes 1992, p.444), and the claim that colors do not (or cannot) look like dispositional properties (see, e.g., Johnston 1997, pp.226-7; Averill and Hazlett 2010, p. 142-3).

Oxford Realists and others have argued against premise (i) primarily by invoking additional considerations that they think speak on behalf of it (as opposed to arguing directly against the considerations just mentioned). Perhaps most strikingly, some have argued against premise (i) on the grounds that it is *incoherent* to think of color is an intrinsic property of objects (see, e.g., Evans 1985, p.272; McDowell 1985, p.113). Others have also invoked the ineliminable role that human perceptual faculties play in characterizing colors (see, e.g., Dummett 1993, p.394), analogies between color experience and the experience of manifestly dispositional properties (see, e.g., Langsam 2000, p.74), the ease with which we entertain the possibility of behaviorally-indetectable variation in color experience (see, e.g., Levin 2000, p.161), and tacit knowledge of the dependence of color appearance on line-of-sight and illumination conditions (see, e.g., Adams 2012, p.77).

In an attempt to break the argumentative deadlock over how to characterize the "common sense" conception of colors, some philosophers have begun to use the tools of the experimental cognitive sciences to investigate how non-philosophers think about color, in the hope that this might be a better guide to whether or not our ordinary conception of color involves representing it as an intrinsic property of objects.

3. Interpersonal Variation in Two Experiments on the Ordinary Conception of Color

There are two experimental studies that aim to directly address the question of whether non-philosophers conceive of colors as relational or non-relational properties: Cohen and Nichols (2010) and Roberts et al. (2014). Cohen and Nichols find that only a minority (35.5%) of participants consistently judge in a way that is compatible with color being a non-relational property, in contrast with a majority who judge in a way that is compatible with shape being a non-relational property (65.5%). Cohen and Nichols argue that their findings pose a problem for arguments that assume that the "common sense" conception of color represents it as an intrinsic, non-relational property. But their results also do not put them in a position to claim that the "common sense" conception of color is clearly relational, either—they found that 47% of responses were consistent with relationalism

about color, while 53% were consistent with anti-relationalism about color.[6] Though they themselves do not draw this conclusion, Cohen and Nichols' results call into question the assumption that there is a single, univocal "ordinary" or "common sense" conception of color as either intrinsic or relational.

Roberts et al. (2014) criticize the earlier Cohen and Nichols experiment on the grounds that the anti-relationalist response option they offered does not adequately distinguish linguistic, perceptual, and ontological claims about how people ordinarily think about the nature of color and shape. What might look at first glance like a non-relationalist judgment about color might instead indicate, for example, a claim about linguistic disagreement. Roberts et al. asked their participants a series of preliminary questions before asking the target ontological questions about the existence of "absolute" (non-relational) facts of the matter about color and shape; these preliminary questions were intended to distinguish the target ontological question from alternative interpretations. They found that 72.3% of their participants gave anti-relationalist responses to their target prompt about color, and 85.9% gave anti-relational responses to their target prompt about shape, but the difference between these responses was not statistically significant. When they analysed the responses in two separate groups, one composed of participants with postgraduate training ("Philpost") in philosophy, the other without postgraduate training in philosophy ("Not-philpost"), Philpost did respond to the target color question and the target shape question in statistically significantly different ways (64.7% non-relational responses to the target color prompt, and 92.9% non-relational responses to the target shape prompt), whereas Not-philpost did not (75% non-relational responses for color, and 84% for shape).

Roberts et al (2014, §5) gloss their results as follows:

> [C]ompared with 53.00% of Cohen and Nichols' participants, 72.30% of our participants, and 75.00% for Not-Philpost, indicated agreement with anti-relationalism about colour. Thus, our results suggest that things are not nearly as ambiguous as Cohen and Nichols' study would have us believe. In fact, our data suggests that anti-relationalism is clearly the pre-theoretically intuitive position.

That conclusion, however, is too hasty, for two reasons. First, there is still a substantial minority of relationalist responses to the target statement for color, even among "ordinary" participants who have not had postgraduate training in philosophy. Roberts et al. are assuming that there is a single, univocal "common sense" conception of color that their results are uncovering, but that is not supported by their data. Second, Roberts et al. are measuring levels of *agreement* with an affirmative target statement that expresses an anti-relationalist claim. There is a well-known acquiescence (or "yea-saying") bias in responses to surveys, which can lead to artificial inflation of rates of agreement with claims like the target prompt, irrespective of their content (see, e.g., Jackman 1973). A standard way of controlling for acquiescence bias is by asking for responses to both

[6] They do not report what percentage of participants gave consistently relationalist responses to their survey.

positive and negative statements. For example, consider the relative appeal of Roberts et al.'s anti-relationalist prompt and its relationalist negation:

> *Target [original, anti-relationalist]*. In reality, there is an absolute fact of the matter about the colour [or shape] of the object regardless of how it appears to Alex and Harry and regardless of what they think, say, or do.
>
> Target *[reversed, relationalist]*. In reality, there is not an absolute fact of the matter about the colour [or shape] of the object; its colour depends on how it appears to Alex and Harry, or on what they think, say, or do.

If participants' responses to these two prompts were mirror images of each other, generating high levels of agreement with the original target, and high levels of disagreement with the reversed version, that would rule out the presence of acquiescence bias and generate much stronger evidence in favor of Roberts et al.'s conclusion.

While Cohen and Nichols (2010) and Roberts et al. (2014) are important first attempts to experimentally investigate aspects of the "common sense" conception of color, neither study decisively establishes that the "common sense" conception of color is best characterized as either relationalist or anti-relationalist, and we think there is good reason to take the central lesson of these two studies to be that there is interpersonal variation in whether color is thought of as an intrinsic or relational property. That is, the studies should make us wonder whether there is a single univocal way that colors are represented in "common sense".

4. Intrapersonal Variation in the "Common Sense" Conception of Color

Cohen and Nichols's experiment asks for color judgments about a tomato, and Roberts et al.'s experiment asks for color judgments about a generic, unspecified "object."[7] We think that the type of examples employed in both experiments contributes to an illusion of univocality in the "common sense" conception of color, even bracketing concerns about interpersonal variation raised in the previous section.

The focus on an extremely limited set of objects is an instance of what Austin (1962, p.3) criticized as a typically "philosophical" obsession with a narrow range of examples:

> My general opinion about this doctrine is that it is a typically scholastic view, attributable…to an obsession with a few (and nearly always the same) half-studied 'facts'. (I say 'scholastic', but I might just as well have said 'philosophical'; over-simplification, schematization, and constant obsessive repetition of the same small range of jejune 'examples' are not only not peculiar to this case, but far too common to be dismissed as an occasional weakness of philosophers.)

[7] For discussion of the methodological significance of "generic" objects, see Cavell (1979, pp.52-57).

Austin goes on to discuss the class of "familiar items" that philosophers rely on in their discussion of the beliefs of what the "ordinary man" would say that he perceives, which Austin famously characterizes as "moderate-sized specimens of dry goods":

> We are given, as examples, 'familiar objects'—chairs, tables, pictures, books, flowers, pens, cigarettes…

Austin observes that this list of items leaves out many other items that people say that they see or hear or smell, which would include at least:

> …people, people's voices, rivers, mountains, flames, rainbows, shadows, pictures on the screen at the cinema, pictures in books or hung on walls, vapours, gases… (p. 8)

Any comprehensive assessment of the "common sense" conception of color should not stop at beliefs about "moderate-sized specimens of dry goods" (including tomatoes), however, but also ask about objects from Austin's expanded list. Consider rainbows.

Try plugging in "rainbow" as the object in Roberts et al.'s target statement:[8]

> *Target [rainbow].* In reality, there is an absolute fact of the matter about the colour of a rainbow regardless of how it appears to Alex and Harry.

Asking about the color of a rainbow immediately draws attention to a number of considerations that are overlooked by Roberts et al.'s discussion of generic objects. Consider how rainbows are only visible under specific lighting and atmospheric conditions, and from a specific point of view, as well as how those conditions affect the rainbows themselves: if Alex moves to the left, and Harry moves the right, the rainbow(s) that they see will appear to move in opposite directions; if something comes in between Alex and the light source behind him, but not between Harry and the light source, then the rainbow that Alex sees, but not the rainbow that Harry sees, will cease to exist. Also, the vividness of the rainbow depends directly on the lighting and atmospheric conditions, as does the very existence of the rainbow itself. These sorts of considerations immediately raise the question of whether we ordinarily think of rainbows themselves as stable, non-relational objects, which thereby complicates the question of whether we think of their colors as stable, non-relational properties.

[8] Here we are following the advice of Wilson (2006, p. 79): "A useful form of experimentation to employ in such cases is to lower the level of abstraction by replacing the programmatic 'thing' throughout by some suitable exemplar…"

Or consider the back of a compact disc. Johnston (1997) observes how the "unsteady colors" on the back of a CD, unlike the "steady" colors of moderate-sized dry goods, seem manifestly relational:

> A basic phenomenological fact is that we see most of the colors of things as "steady" features of those things, in the sense of features which do not alter as the light alters and as the observer changes position. ... A course of experience as of the steady colors is a course of experience as of light-independent and observer-independent properties, properties simply made evident to appropriately placed perceivers by adequate lighting. Contrast the highlights: a course of experience as of the highlights reveals their relational nature. They change as the observer changes position relative to the light source. They darken markedly as the light source darkens. With sufficiently dim light they disappear while the ordinary [i.e., "steady"] colors remain. They wear their light- and observer-dependent natures on their face. Thus there is some truth in the oft-made suggestion that (steady) colors don't look like dispositions; to which the natural reply is "Just how would they have to look if they were to look like dispositions?"; to which the correct response is that they would have to look like colored highlights or better, like shifting, unsteady colors, e.g., the swirling evanescent colors that one sees on the back of compact discs. (Johnston 1997, p. 226-227)

Johnston's discussion makes clear that his "common sense" conception of color is not uniform in terms of how it represents color as intrinsic or relational—it admits of variation across different objects.

For another type of object not typically invoked in philosophical discussions of the nature of color, consider the following thought experiment (from Adams 2015) concerning mirrors.

> You are a professional truck driver. You are making a delivery that involves backing your truck down a narrow alley up to a loading dock. In order to see what is behind the truck, you must rely entirely on the use of your side view mirrors. Doing so, by using your mirror, you see that someone standing on the dock is wearing a red Santa Claus outfit.
>
> Ask yourself the following questions:
>
> Q1: Do you think the Santa Claus outfit would continue to be red in the dark?
> Q2: Do you think the mirror would continue to be red in the dark?
> Q3: Do you think that the Santa Claus outfit would continue to be red if you move in such a way that you are no longer able to see it?
> Q4: Do you think that the mirror would continue to be red if you move in such a way that you are no longer able to see it?

It seems (to us and Maund 2016 at least) that the intuitive answer to the odd numbered questions is clearly *yes* while the answer to the even numbered questions is clearly *no*. But those different responses are indicative of different attitudes about the intrinsic vs. relational nature of the color of the Santa Claus outfit and the mirror: it seems we judge that the color properties of the mirror are dependent on lighting conditions and viewing angle, while the color properties of the Santa Claus outfit are not.

Again, consider plugging in "mirror" into a suitably modified version of the Roberts et al. target statement:

> *Target [mirror].* In reality, there is an absolute fact of the matter about the colour of a mirror regardless of how it appears to Alex and Harry.

By expanding the range of examples beyond standard moderate-sized dry goods (or generic objects), the existence of *intrapersonal* variation in the "common sense" conception of color is revealed: even when it may seem appropriate to judge that certain objects (tomatoes, Santa Claus outfits) are red non-relationally, it may seem, to the same person at the same time, appropriate to judge that other objects (rainbows, compact discs, mirrors) are red only relationally. This is another reason to doubt the idea that there is going to be a univocal "common sense" conception of color.

In addition to object-based variation in whether color appears relational, there is another form of intrapersonal variation in whether color seems relational, which can even affect judgments about one-and-the-same object. Evans (1974) distinguishes different "frames of reference" from which the color of an object can be considered. In the "object" frame of reference,

> An observer is always aware of the illumination though seldom consciously. He has simply trained himself to take such action, automatically, as will maximize his perception of the object properties. We see this in everyday commonplace actions. If a glossy surface reflects light into his eyes, he will move his head, change his position, or, if possible, pick up the object and hold it so the reflection disappears. If the light is too dim he will take an object to the window or to a light. If the illumination is too bright he may shade it with his hand. In other words, he deliberately manipulates the illumination to see the object color; they are two separate things to him but he is usually interested only in the object (Evans 1974, p. 198, quoted in Wilson 2006, p. 458).

Switching from the object frame of reference, observers can intentionally adopt what Evans calls the "stimulus frame of reference." In the stimulus frame of reference, an observer is interested in "seeing, or trying to see, the stimuli as such without regard to the situation" (Evans 1974, p. 205). Evans (1974, p. 206) refers to passage in John Ruskin's *Elements of Drawing* to illustrate the stimulus frame of reference:

> [W]hen grass is lighted strongly by the sun in certain directions, it is turned

> from green into a peculiar and somewhat dusty-looking yellow…if there were primroses near, we should think that the sunlighted grass was another mass of plants of the same sulphur-yellow color…Very few people have any idea that sunlighted grass is yellow (Ruskin 1876, pp. 27–28, n. 1).

Adopting the stimulus frame of reference involves treating colors of objects as explicitly relational—as how the object looks from this angle, at this distance, under these lighting conditions. We can intentionally switch between the object and stimulus frames of reference, which means that there is no settled univocal "common sense" conception of the color of objects as relational or non-relational, even within a single subject and with regard to a single object.

Whether we are inclined to think of color as a relational or non-relational property of an object varies depending on what kind of object is being considered, and on what "frame of reference" we adopt. Those two forms of intrapersonal variation in how we conceive of color put further pressure on the idea that there is a univocal "common sense" conception of color.

5. Historical variation in the "common sense" conception of color

Chirimuuta (2015, Ch. 2) develops another dimension of criticism of the "common sense" conception of color, offering a genealogical account of the intuition that colors are equally as objective as shape or mass.[9] She argues that that intuition, which is endorsed by both eliminativists and some color realists (albeit not Oxford Realists)—is *not* an immutable part of "common sense," where "common sense" is understood as "intuition, part of our perceptual and cognitive endowment, no matter how scientifically sophisticated we are" (p. 32). Instead, she proposes that the idea that color and shape have the same ontological status (that is, that they are both non-relational) is "actually the remnant of scholastic theory," and thus potentially can be changed. She then undertakes the task of "reshaping our intuitions about color sensation" along different lines (p. 34).

Chirimuuta's genealogy begins with a description of the scholastics' "robustly realist epistemology of sight," which derives from their theory of *intentional species*. According to that theory, perception involves the sensory organs coming to have properties possessed by the perceived object—namely, the object's form or species (p. 21). If color is understood as a form or species of a perceived object, then a "strong color realism," according to which color belongs to the perceived object (as well as the perceptual organ), follows from the theory of intentional species. It is this strong color realism that is challenged by the new scientific world view that emerges in the seventeenth century. Chirimuuta summarizes the relation between the scholastic conception of colors and the scientific rejection of that conception as follows:

[9] For some recent reflections on the genealogical method in philosophy more generally, see Dutilh Novaes (2016) and Plunkett (2016).

> In the late Middle Ages colors are very much in the world. There is no mismatch between perceptual phenomenology and scientific ontology. Therefore there is no problem of color. At the same time scholastic realism set color up for a fall. By intimating so strong a notion of the objectivity of vision—that the world is as we see it to be—it was inevitable that colors would be found wanting, thus inviting the Galilean criticism that we are entirely wrong in our association of color experiences with physical objects. (p. 22)

The seventeenth century emergence of an eliminativist "error theory" about color, which persists in contemporary philosophizing, rests on the idea that "common sense" represents colors as belonging to objects non-relationally. But once we come to see that the purportedly "common sense" conception of color is "is not just unschooled intuition, but part of a sophisticated theoretical edifice" (p. 26), then we won't be moved to deny the existence of colors as such.

We are sympathetic with Chirimuuta's historical criticisms of the idea that the "common sense" conception of color is non-relational, but in §§2-3 we have given reasons (from interpersonal and intrapersonal variation in the contemporary "common sense" conception) to think that it is a mistake to think that there is a univocal contemporary "common sense" conception of color as non-relational in the first place.[10] Given our arguments, her account might better be thought of as explaining the origin and persistence of certain *philosophers'* assumption that "common sense" represents color as non-relational. But her genealogical approach is a fruitful way of investigating another dimension along which the "common sense" conception of color may vary. In the following two sections, we will adopt a genealogical approach to a more nuanced but still inadequate way of thinking about the "common sense" conception of color.

6. A Wider Array of "Core Beliefs" about Colors

The debate central to the first part of this essay hinged on a single, purportedly "common sense" belief about color, namely whether we ordinarily believe that colors are intrinsic or relational properties of objects. The eliminativist argument rests upon the presupposition that if that single belief turns out to be false, then colors don't exist. That presupposition involves the contentious idea that there is a *single* essential belief at the center of the "common sense" conception of color. Mark Johnston's "How to speak of the colors" offers a more nuanced framework for exploring the "common sense" conception of color than the experimental studies discussed in §3 (even though it was published nearly 20 years earlier). Johnston proposes that the "common sense" conception of color is a "cluster concept" composed of five "core beliefs." Significantly, Johnston's proposal thus explicitly rejects any attempt to tie the "common sense" conception color to any particular single belief (a tendency which extends beyond the debate outlined above to include other articles, such as Strawson 1989 and Boghossian

[10] Adams (2015) offers a genealogy of our contemporary concept of color according to which it is made up of multiple conflicting but intertwined strands of thought.

and Velleman 1989, for example).

Rather than focusing solely on the issue of whether colors are represented as intrinsic or relational, Johnston explores the extent to which each of his five "core beliefs" about color may or may not be "at odds with discovered facts" (Johnston 1997, p.137), as a way of determining how many (if any) of the five "core beliefs" can be retained by a defensible metaphysical theory of color. His conclusion is that an "*ever so inclusive*" conception of color—one that incorporates all five "core beliefs"—has to be abandoned, but that a "*more or less inclusive*" conception of color—one that only incorporates some of the five "core beliefs—can be retained (Johnston 1997, p.137). Retaining some of the "core beliefs" is sufficient to prevent wholesale elimination of the concept of color—though it may require revision of some parts of the "common sense" concept.

Here are the five "core beliefs" about color that Johnston proposes (with "canary yellow" standing in for all colors) (Johnston 1997, p.138):

> *Paradigms*. Some of what we take to be paradigms of canary yellow things (e.g. some canaries) are canary yellow.
>
> *Explanation*. The fact of a surface or volume or radiant source being canary yellow sometimes causally explains our visual experience as of canary yellow things.
>
> *Unity*. Thanks to its nature and the nature of the other determinate shades, canary yellow, like the other shades, has its own unique place in the network of similarity, difference and exclusion relations exhibited by the whole family of shades.
>
> *Availability*. Justified belief about the canary yellowness of external things is available simply on the basis of visual perception. That is, if external things are canary yellow we are justified in believing this just on the basis of visual perception and the beliefs which typically inform it.
>
> *Revelation*. The intrinsic nature of canary yellow is fully revealed by a standard visual experience as of a canary yellow thing.

For Johnston, the most important questions are how many, if any, of these beliefs can be retained, and what sort of metaphysical view of the nature of colors they imply. He concludes that a dispositional theory of the colors offers the most inclusive account of the "core beliefs".

Johnston's project depends upon two major assumptions. First, it assumes that the success or failure of metaphysical theories of color is measured by the extent to which they accommodate "core" aspects of the concept of color. Second, his project assumes that we are "susceptible" to the "core beliefs," in a very specific sense. According to Johnson, we find ourselves with the "core beliefs" about color solely in virtue of (a)

visual experience of colors and (b) a grasp of ordinary color language (Johnston 1997, p. 137). In short, human beings with normal perceptual abilities who are competent speakers of a language should simply find themselves with the "core beliefs" about color. Call this *the susceptibility assumption*. If it turned out that adherence to the "core beliefs" was highly variable (across individuals, cultures, or historical periods), then the idea that metaphysical theories of color should be assessed in terms of how well they satisfy such beliefs would have to be reconsidered.

Johnston's first assumption is very contentious. The assumption has been defended by advocates of contemporary ordinary language philosophy (including contextualists about "knows" and some experimental philosophers), who argue that revisionary theories of philosophically significant concepts like *yellow* or *knowledge* fail because they change the subject—they are not theories of what they purport to be about. Hansen (2014, p. 561) formulates the argument behind this position as follows:

Premise (i)	If we want our philosophical theories (of knowledge [or color], e.g.) to address the concerns that led us to philosophical investigation in the first place, then they need to be about the relevant objects of investigation as they are 'ordinarily understood outside of strictly philosophical discourse' (Alexander and Weinberg, 2007, p. 58).
Premise (ii)	We do want our philosophical theories (of knowledge, e.g.) to address the concerns that led us to philosophical investigation in the first place.
Conclusion	So our philosophical theories need to be about the relevant objects of investigation (*knowledge* [or *color*], e.g.) as they are ordinarily understood outside of strictly philosophical discourse.

One standard criticism of Johnston's first assumption is that it is simply a mistake to assume that the relevant objects of investigation can only be understood via whatever "folk categories" first led us to be interested in them. Here is how Byrne and Hilbert (2003, p.4) motivate this criticism:

> Consider an analogy. From the point of view of the biologist, the word "food" is applied by ordinary people in a somewhat arbitrary way. According to them, the synthetic cooking oil Olestra, which has no nutritional value at all, is a food, but vitamin tablets and beer are not. An investigation of how ordinary people use the word "food" is not particularly relevant to biology. What is relevant is an investigation into the sorts of substances human beings can digest, whether or not the biological category of the digestible lines up exactly with the folk category of food. *The problem of color realism is like the investigation of what humans can digest, not the investigation of the folk category of food.* The enquiry concerns certain properties that objects visually appear to have, not how ordinary people use color words, or how they conceptualize color categories. (Emphasis in original)

In this paper, we will not enter into this ongoing debate over the first assumption. Our concern is with Johnston's second assumption, *the susceptibility assumption*. We think there is evidence that at least some of Johnston's "core beliefs" are *not* simply the result of visual experience and grasp of ordinary color language. Our evidence is historical.[11] We think that a genealogical approach to thought about color provides evidence that many of our "core beliefs" about color are historically contingent, which means that we are not "susceptible" to them in Johnston's sense.

7. A Genealogy of Some "Core Beliefs" about Color

Our goal in this section is to make the case that although some of Johnston's "core beliefs" might correctly characterize our *contemporary* "common sense" conception of color, they probably would not have been "core beliefs" in earlier historical periods. To make our case, we focus on the "core beliefs" of *Explanation* and *Unity*. In brief, we argue that the notion of "causal explanation" invoked in *Explanation* has varied widely across its history, just as beliefs about the similarity and difference relationships invoked in *Unity* have varied. In both cases, the notions that Johnston is working with appear to be modern developments, and hence cannot be something that humans are "susceptible" to in virtue solely of visual experience of colors and grasp of ordinary color language.[12]

First, consider *Explanation*. According to Johnston, it is part of our "common sense" conception of colors that an object's being (for instance) canary yellow causally explains visual experiences of it as being canary yellow (Johnston 1997, p.138).[13] Johnston is presumably thinking of colors as efficient causes, as opposed to their being material, formal, or final causes.[14] But merely raising the question of which of these four types of

[11] We think that some of Johnston's "core beliefs" are accurate characterizations of aspects of the contemporary "common sense" conception of color. There is unpublished experimental evidence (Roberts and Schmidtke, 2019) that provides some support to the claim that the "core beliefs" correctly characterize our contemporary "common sense" conception of color. In particular, it seems hard to dispute that both *Paradigms* and *Unity* are aspects of contemporary "common sense" ways of thinking about color.

[12] Our goal in this section is not to argue that there is *no* "common sense" conception that does not change over time, or even that there is no possible way of weakening Johnston's "core beliefs" so that they would correctly characterize ancient (e.g.) beliefs about color. In this respect, we agree with Chirimuuta (2015 p.32 n. 16) who writes: "Note that I remain neutral over the issue of whether there might be any universal folk theory of color, one that makes weaker claims about the nature of color than those typically formulated under the heading of common sense." Our criticism of the "common sense" conception of color is targeted at the way that idea has been developed and deployed by philosophers.

[13] Other philosophers who share Johnston's commitment to thinking that *Explanation* is one of our "core beliefs" about color include Hacker (1987); Broackes (1992); Campbell (1993); Jackson (1996); Watkins (2005); and Maund (2006). Notable dissenters include White (1961) and Hyman (2006). As Hyman puts it, "an analysis of the basic conception of color that is implicit in the simplest color statements we make" reveals that "colors are inert, in the sense that they cannot influence what happens" (19). As with the debate between eliminativists and Oxford Realists outlined in §2, we think it is telling that there is such stark disagreement among philosophers about the content of putatively "common sense" beliefs.

[14] For a useful overview of the distinction between efficient, material, formal, and final causes, see Falcon (2015).

causation Johnston has in mind immediately raises the larger question of whether there is a single, shared, ahistorical "common sense" conception of efficient causation itself.

By looking at the history of thought about efficient causation, however, we can see that there is *not* a single, shared conception of efficient causation.[15] On the contrary, the notion of efficient causation has gone through a series of transformations from Aristotle's time to our own. Perhaps most strikingly, for Aristotle an understanding of efficient causation was not something one could have in isolation from an understanding of the three other sorts of causal understanding just mentioned; in particular, an understanding of something's efficient cause essentially depends upon an understanding of its final cause.[16] The notion of efficient causation has since been transformed by being wrenched from its internal relationship to these other sorts of causation. As Tad Schmaltz summarizes this history,

> Somewhere along the road that leads from Aristotle to our own time, then, material, formal and final *aitai* [causes] were lost, leaving only efficient *aitia* to serve as the central element in our causal explanations. Indeed, there is reason to think that the journal has transformed Aristotle's efficient *aitai* into something he could not have anticipated. … There is in fact no straightforward connection between Aristotle's concept of an efficient *aitai* and our concept of a cause. (Schmaltz 2014, p.5)

For our purposes, the takeaway point from this history is simply that, as Michael Frede puts it, "Aristotle's notion of cause, then, is quite different from ours" (Frede 1980, p.218).[17] This observation, in itself, should make us wary of thinking that Johnston's own understanding of efficient causation is a deliverance of ahistorical "common sense."

There is an additional benefit to be gained from looking at this history. It helps us to see how a shared language or culture is not sufficient for having a shared understanding of causal explanation. For instance, as the result of surveying both ancient Greek and ancient Chinese writers, G. E. R. Lloyd notes that "the diversity of views expressed by different authors within each ancient civilization is remarkable" because "there was no uniformity about what was to count as a cause" (Lloyd 2007, p.128 and 123). This is a telling reminder of how sensitivity to the history of a concept can make us more attuned to the possibility of conceptual variation not just across times and places but even within

[15] Schmaltz (2014) is a useful overview of the history of thought about efficient causation.
[16] As Alan Code puts this aspect of Aristotle's view, with specific reference to the efficient causes involved in an animal's conception and growth, "Knowledge of the efficient causes by means of which animals are generated is posterior to knowledge of their final causes" (Code 1997, p.143).
[17] Summarizing the difference between Aristotle's understanding of efficient causation and our own contemporary conception is difficult not just because of debates within Aristotle scholarship about how to interpret his view, but also because there is widespread disagreement about what "our" view is. That said, here is Menno Hulswit's gloss on the difference: "All in all, the complex evolution of the concept of cause from the seventeenth century on is marked by the interplay between, at least, two radically different conceptions of cause: the Aristotelian-scholastic conception, according to which causes are the *active initiators of a change,* and the scientific conception, according to which causes are the *inactive nodes in a law-like implication chain*" (Hulswit 2002, p.44).

a particular time and place, variation that our own situatedness in our present time and place might lead us to overlook.

Now consider *Unity.* Johnston gives a clear expression to his *susceptibility* assumption in relation to the "core belief" of *Unity* in the following passage:

> But is it really a matter of scientific discovery that canary yellow is not a shade of blue? No: such similarity and difference principles surely have a different status. We take ourselves to know these principles just on the basis of visual experience and ordinary grasp of color language. No one had to wait until the end of the second millennium A.D. to find out whether or not canary yellow is a shade of blue. (Johnston 1997, p.150)

By looking at ancient attempts to organize color space, however, we can appreciate how our own understanding of the "internal" relations among colors, captured by *Unity*, is an historical development, the result of centuries of work reflecting on and refining our contemporary models of how color is represented in visual experience. Consider, for example, Plato's discussion of relations among colors from the *Timeaus,* and the visual representation of the resulting relations in Figure 2-1 (quotation and figure from from Kuehni 2003, pp. 22-23)*:*

> …we ought to term white that which dilates the visual ray, and the opposite of this black. . . . in (the eye) the fire, mingling with the ray of the moisture, produces a color like blood, to which we give the name red. A bright hue mingled with red and white gives the color auburn [*xandon*]. The law of proportion, however, according to which the several colors are formed, even if a man knew he would be foolish in telling, for he could not give any necessary reason, nor indeed any tolerable or probable explanation of them. Again, red when mingled with black and white, becomes purple, but it becomes umber [*orphninon*] when the colors are burned as well as mingled and the black more thoroughly mixed with them. Flame color [*pyrron*] is produced by a union of auburn and dun [*phaion*], dun by an admixture of black and white; and pale yellow [*ochron*] by an admixture of white and auburn. White and bright meeting and falling upon a full black, become dark blue [*kyanoyn*], and when the dark blue mingles with white a light blue [*glaykon*] color is formed as flame color with black makes leek-green [*prasion*]. There will be no difficulty in seeing how and by what mixtures the colors derived from these are made according to the rules of probability.

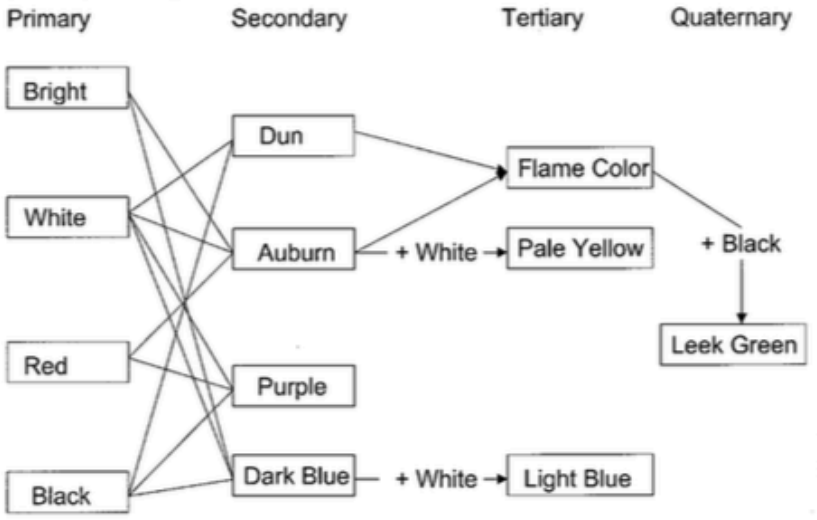

Fig. 2-1 *Plato's color mixture scheme. The four primary experiences are bright, white, red and black. Additions of these in various combinations form the secondary and later stage mixture colors.*

Notice that, according to Plato's system of color ordering, leek green is derivable from red (whereas, on our contemporary scheme, green and red are opposites). Pale yellow and light blue are both tertiary colors that are both produced by mixing white with secondary colors. Plato's scheme represents a radically different conception of the relation among shades than our contemporary understanding of color space.

Describing Plato's color system, Kuehni (2003) writes:

> There is clearly an awareness of lightness from the sequences "auburn plus white makes light yellow" and "dark blue plus white makes light blue", as well as "purple burned makes umber." But there is no indication of a systematic arrangement by lightness. (p. 25)

Roughly seven hundred years later, a Medieval commentary on Plato's *Timeaus* by Chalcidius still employed a one-dimensional color scale, with five basic colors: white—yellow—red—blue—black. Multi-dimensional color spaces can be traced back to Avicenna (980–1037) (Kuehni, 2003, p. 27), but the first "explicit" hue circle representing the familiar relations of similarity, difference, and exclusion that Johnston has in mind was created by Isaac Newton (Kuehni, p. 43).

Modern color ordering systems are an historical development, the result of centuries of work refining the representation of color space. Distinguishing hue from lightness (the white-black scale), for example, is not something we are "susceptible" to in Johnston's sense—black and blue can seem phenomenologically similar, just as white and yellow

can seem phenomenologically similar. Distinguishing the relevant dimensions of similarity and difference requires experimentation and theory-building.[18]

In short, we think that whatever "susceptibility" there is to certain conceptions of relations of similarity, dissimilarity, and exclusion that might constitute a "core belief" of *Unity* is not due solely to visual experience and grasp of ordinary color language—it is an historical, theoretical development.[19]

8. Conclusion: The Myth of the "Common Sense" Conception of Color

Our aim in this essay has been to challenge the univocality of "the common sense" conception of color. Ordinary, non-philosophical, conceptions of color vary in several different dimensions:

(a) There is experimental evidence of *interpersonal* variation in whether non-philosophers conceive of the color of objects as relational or non-relational properties (moreover, there is no disputing the fact that there is interpersonal variation in how *philosophers* conceive of colors!) (§2).

(b) Once the set of examples under discussion expands from generic objects to the more diverse objects that Austin encourages us to think about, the fact of substantial *intrapersonal* variation in whether color is conceived of relationally or non-relationally becomes hard to deny, in two ways. First, certain types of objects (rainbows, the backs of CDs, mirrors) seem to have colors in manifestly relational ways, while other objects (tomatoes and other "moderately-sized dry goods") seem to have colors in relatively "stable" non-relational ways. Secondly, with an intentional shift in "frame of reference", even those objects that seem to have "stable" colors can come to appear to have colors in manifestly relational ways.

(c) Some of Johnston's (1997) "core beliefs" about color, namely *Unity* and *Explanation*, are historical developments, rather than *ur*-beliefs that we are "susceptible" to simply in virtue of having color experiences and being competent with color vocabulary. This historical variation in supposedly "core beliefs" makes it difficult to maintain that metaphysical theories of color should be assessed in terms of how well they fit with commonsensical "core beliefs" unless the existence of such "core beliefs" is backed up with evidence indicating that they are aspects of an ahistorical (and non-culturally relative) conception of color.

In light of these dimensions of variation, we conclude that the idea of a univocal, ahistorical, "common sense" conception of color, as it has been discussed by philosophers, is a myth.

---

[18] See Kuehni (2003) for a detailed historical survey of the development of color ordering systems. See also Mausfeld (2003).

[19] For a challenge to the idea of a unified color space from cultural variation, see Gage (2012), and Lloyd (2007, Ch.1).

BIBLIOGRAPHY

Adams, Z. (2012) “Seeing is Knowing”, *Review of Metaphysics* 66 (1):61-88.

Adams, Z. (2015) *On the Genealogy of Color: A Case Study in Historicized Conceptual Analysis*. New York: Routledge.

Alexander, J., and J. Weinberg (2007) “Analytic Epistemology and Experimental Philosophy”, *Philosophy Compass,* 2(1): 56-80.

Allen, K. (2007) “The mind-independence of colour”, *European Journal of Philosophy* 15(2):137–158.

Austin, J.L. (1962) *Sense and Sensibilia*. Oxford: Oxford University Press.

Averill, E.W. and A. Hazlett (2010) “A Problem for Relational Theories of Color”, *Philosophy and Phenomenological Research*, 91(1): 140-145.

Boghossian, P.A. & Velleman, J.D. (1989) “Color as a secondary quality”, *Mind* 98:81-103.

Broackes, J. (1992) “The autonomy of colour”, in K. Lennon & D. Charles (eds.), *Reduction, Explanation, and Realism*: 191-225. Oxford: Oxford University Press.

Byrne, A. & Hilbert, D.R. (2003) “Color realism and color science”, *Behavioral and Brain Sciences* 26(1):3-21.

Campbell, J. (1993) “A simple view of colour”, in John J. Haldane & C. Wright (eds.), *Reality: Representation and Projection*: 257-268. Oxford: Oxford University Press.

Cavell, S. (1979) *The Claim of Reason*. Oxford: Oxford University Press.

Chirimuuta, M. (2015) *Outside Color: Perceptual Science and the Puzzle of Color in Philosophy*. Cambridge, MA: MIT Press.

Code, A. (1997) “The priority of final over efficient cause in Aristotle’s Parts of animals,” in *Aristotelische Biologie*, ed. W. Kullmann and S. Föllinger. Stuttgart: 127–43.

Cohen, J. and S. Nichols. (2010) “Colours, colour relationalism and the deliverances of introspection.” *Analysis* 70(2): 218-228.

Dutihl Novaes, C. (2016) “Conceptual Genealogy for Analytic Philosophy”, in Bell, A. Cutrofello, P.M. Livingston (eds.), *Beyond the Analytic-Continental Divide: Pluralist Philosophy in the Twenty-First Century.* New York: Routledge.

Evans, R.M. (1974) *The Perception of Color*. New York: John Wiley and Sons.

Evans, G. (1985) “Things without the Mind—A Commentary upon Chapter Two of Strawson’s *Individuals*, in *Collected Papers*, Oxford: Oxford University Press, 249-290.

Falcon, A., (2015) "Aristotle on Causality", *The Stanford Encyclopedia of Philosophy* (Spring 2015 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/spr2015/entries/aristotle-causality/>. [Accessed January 17, 2017]

Frede, M., 1980 “The Original Notion of Cause,” in J. Barnes, M. F. Burnyeat, M. Schofield (eds.), *Doubt and Dogmatism: Studies in Hellenistic Epistemology*, Oxford: Oxford University Press: 217–249.

Gage, J. (2012) “Colour Ordered and Disordered”, in F. G. Barth, P. Giampieri-Deutsch, and H-D. Klein, *Sensory Perception: Mind and Matter*. Vienna: Springer, 299-311.

Gert, J. (2006) “A Realistic Colour Realism”, *Australasian Journal of Philosophy* 84(4): 565-589.

Hacker, P. M. S. (1986) *Insight and Illusion: Themes in the Philosophy of Wittgenstein*. Oxford: Oxford University Press.

Hansen, N. (2011) “Color Adjectives and Radical Contextualism”, *Linguistics and Philosophy,* 34(3): 201-221.

Hansen, N. (2014) “Contemporary Ordinary Language Philosophy”, *Philosophy Compass*, 9(8): 556-569.

Hulswit, M. (2002) *From Cause to Causation a Peircean Perspective*. Dordrecht: Springer.

Hyman, J. (2006). *The Objective Eye*. Chicago: University of Chicago Press.

Jackman, M.R. (1973) “Education and Prejudice or Education and Response-Set?” *American Sociological Review* 38(3): 327-339.

Jackson, F. (1996) “The Primary Quality View of Color”, *Philosophical Perspectives* 10: 199-219.

Johnston, M. (1997) “How to Speak of the Colors”, in A. Byrne and D. Hilbert (eds), *Readings on Color, volume 1: The Philosophy of Color,* 137-172. Cambridge, MA: MIT Press.

Kneale, W. (1951) “Sensation and the Physical World”, *The Philosophical Quarterly*, 1(2): 109-126.

Kuehni, R.G. (2003) *Color Space and Its Divisions: Color Order from Antiquity to the Present*. Hoboken, NJ: John Wiley and Sons.

Langsam, H. (2000) "Why Colors Do Look Like Dispositions", *The Philosophical Quarterly* 50(198): 68-75.

Levin, J. (2000) "Dispositional Theories of Color and the Claims of Common Sense", *Philosophical Studies* 100(2): 151-174.

Levine, J. (2006) "Colors and Color Experience: Colors as Ways of Appearing", *dialectica* 60(3): 269-282.

Lloyd, G.E.R. (2007) *Cognitive Variations: Reflections on the Unity and Diversity of the Human Mind*. Oxford: Oxford University Press.

Mackie, J.L. (1976) *Problems from Locke.* Oxford: Clarendon Press.

Maund, B. (2006) "The Illusory Theory of Colours: An Anti-Realist Theory." *dialectica*, 60(3): 245–68.

Maund, B. (2011) "Color Eliminativism", in *Primary and Secondary Qualities: The Historical and Ongoing Debate*, L. Nolan (ed), 362-385. New York: Oxford University Press.

Maund, B. (2016) "Review of Zed Adams, *On the Genealogy of Color: A Case Study in Historicized Conceptual Analysis*", *Notre Dame Philosophical Reviews,* http://ndpr.nd.edu/news/70511-on-the-genealogy-of-color-a-case-study-in-historicized-conceptual-analysis/

Mausfeld, R. (2003) "'Colour' As Part of the Format of Different Perceptual Primitives: The Dual Coding of Colour", R. Mausfeld (ed), *Colour Perception: Mind and the Physical World*, 381-436. Oxford: Oxford University Press.

McDowell, J. "Values and secondary qualities." In *Morality and Objectivity: A Tribute to J. L. Mackie*, T. Honderich (ed), 110–129. London: Routledge & Kegan Paul, 1985.

McGinn, C. "Another Look at Color." *Journal of Philosophy* 93, no. 11 (1996): 537-53.

Plunkett, D. (2016) "Conceptual History, Conceptual Ethics, and the Aims of Inquiry: A Framework for Thinking about the Relevance of the History/Genealogy of Concepts to Normative Inquiry", *Ergo* 3(2): 27-64.

Roberts, P., J. Andow, K. Schmidtke (2014) "Colour Relationalism and the Real Deliverances of Introspection", *Erkenntnis* 79(5): 1173-1189.

Roberts, P. and K. Schmidtke (2019) "Folk Core Beliefs about Colour", *Review of Philosophy and Psychology.*

Ruskin, J. (1876) *The Elements of Drawing*. New York: John Wiley and Sons.

Schmaltz, T.M. (ed.) (2014). *Efficient Causation: A History*. New York: Oxford University Press.

Strawson, G. (1989) "Red and 'Red'", *Synthese* 78: 193-232.

Travis, C. and M. Kalderon (2013) "Oxford Realism", in *Oxford Handbook of the History of Analytic Philosophy*, M. Beaney (ed): 489-517. Oxford: Oxford University Press.

Watkins, M. (2002). *Rediscovering Colors: A Study in Pollyanna Realism*. Dordrecht: Springer.

White, A.R. (1961) "The Causal Theory of Perception, Part II", *Proceedings of the Aristotelian Society* 153:153-168.

Wilson, M. (2006) *Wandering Significance: An Essay on Conceptual Behavior.* Oxford: Oxford University Press.