Fictional Colors

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(Forthcoming in *Sorites*, Issue 21)

1. Introduction[*]

Things typically have the colors they appear to have. This thesis, *i.e.*, color realism, seems *prima facie* true. It also seems consistent with the fact that we ordinarily conceptualize the colors as being certain kind of properties –that is, as perceiver-independent, non-dispositional, intrinsic, qualitative features of physical objects with which (normal) perceivers (in a neutral state of adaptation) can have direct acquaintance.[1] Nevertheless, color science invariably informs us that this view is incongruous with what we know about the physical world: although physical surfaces, gases, and volumes may appear colored, nothing has properties like *that*.[2] Moreover, recent evidence suggests that there are widespread intrasubjective and intersubjective color variations among *normal* subjects –subjects who do not have any color deficiencies (Hardin, 2004). These variations stand in the way of drawing a non-arbitrary distinction between veridical and non-veridical color experiences. For if the colors are mind-independent, physical properties as color realists contend,[3] only one of these

[1] 'Acquaintance' is to be understood loosely here since many realists deny that the nature of the colors is revealed in color experience. The most the realist is committed to is saying that colors are present in color experience.

[2] See Herring (1964), Hardin (1993), and Nassau (1983 and (1997).

[3] See Tye (2000) and Hilbert & Byrne (2003).

experiences can be veridical; but which one? Since any considerations that could

arise in support of the veridicality of the experience of one subject could be

matched by considerations in favor of another, there are no non-arbitrary ways

of determining which of the experiences of these normal subjects is veridical.[4]

Color realists have typically attempted to solve this (and other related)

problem(s) by revising our ordinary conception of color in such a way as to

succeed in denoting physical properties which can then be identified with

particular colors.[5] If, however, there is no error-free revisionist account, color

realism cannot be true.[6] Yet if this is right, the discourse that commits us to these

properties –and which is not only logically coherent but also useful in that it

plays an important role in many aspects of our epistemological, social, and

personal lives –seems to be in jeopardy. Johnston (1997), for example, argues that

rejecting (all revisionist versions of) color realism will jeopardize the entire

subject matter. In what follows, I shall argue that the rejection of color realism

need not affect the fate of ordinary color discourse. I will not argue for the claim

that realism is false[7] (partly because this is beyond the scope of this paper and

partly because it is not pertinent to my proposal[8]). I will rather propose an

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[4] I argue for this claim in an unpublished paper, which I presented to the Pacific APA in 2008. See also Tye (2006), and (2006a). For replies to Tye see Cohen *et al.* (2006) and (2007). I argue elsewhere that the individual variability problem threatens both realism and subjectivism about color, see Gatzia (2007).
[5] Johnston (1997), McLaughlin (2003), and Cohen (2000) are among those who defend a variety of distinct revisionist accounts.
[6] For various arguments for the claim that revisionist accounts are flawed see Barry Maund (1995), (2006), and (2006a), Matthen (1999), Arstila (2005), and Gatzia (2007).
[7] I argue for this claim in Gatzia (2007).
[8] My account will be useful even if it turns out that either color properties were instantiated (in the actual world) but were radically different from what we thought they were (and it seems this much is true) or they were the kinds of properties our ordinary color concepts denote but failed to be instantiated in the actual world. My proposal allows us to continue to talk as if there are colored things in both cases.

alternative to it: an account that allows us to save our ordinary color discourse without having to commit to philosophically problematic properties (§ 2-4). I will then discuss some potential worries for my proposal and subsequently offer some plausible responses on the fictionalist's behalf (§ 5).

2. Color Fictionalism: color ascription in the absence of colored objects

Color fictionalism is a species of error theory. An error theory about color can be understood as a conjunction of a *conceptual* claim and an *ontological* claim.[9] According to the conceptual claim, ordinary color discourse genuinely purports to describe properties that have certain features: they are perceiver-independent, intrinsic, non-dispositional properties of physical objects with which (normal) perceivers (in a neutral state of adaptation) can have direct acquaintance. According to the ontological claim, there are no properties like *that*. The color fictionalist acknowledges that color statements are apt for truth or falsity and that they express beliefs, but claims that such statements taken at face value are systematically false. However, unlike the *eliminativist*,[10] who holds that our ordinary color discourse and its peculiar commitments should be abandoned[11]

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[9] Here I am following Mackie (1977), Van Fraassen (1980), and Maund (1995).

[10] As I shall use it, the term 'eliminativist' denotes the elimination of a given discourse upon discovering that that the properties in question which give rise to such discourse do not exist; not merely to denote the elimination of such properties as it has been often used.

[11] I think everyone would agree that eliminativism does not work since it proposes that we should jettison a discourse that is both coherent and useful. Joyce (2006) offers an argument against moral eliminativism, which, I think, can also be applied to color eliminativism. The argument in a nutshell is that if the eliminativist is at a disadvantage regardless of whether he chooses to preserve or discard color discourse: if he chooses to preserve it, he will be asking us to continue believing untruths; if he chooses to discard it, he will be depriving us of a useful discourse.

(perhaps because they think that it will eventually be proved to be incompatible with ordinary science findings[12]), the color fictionalist recommends that we maintain the existing discourse (despite the fact that it is flawed). The account I propose is prescriptive in nature.[13] Prescriptive fictionalists hold that the discourse "entails or embodies a theory that is false", but propose that we should "carry on employing the discourse, at least in many contexts, as if this were not the case".[14] My recommendation is that we replace assertion with make-believe. The act of make-believe amounts to pretending that there are colored things when, in fact, while believing there are none (see also § 2). By revising our practices in this way, we can continue using our color discourse as we have thus far not because it is true, but rather because it can be derivable from truths about the qualitative aspect of color experience together with truths about the external

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[12] Other reasons for deciding to reject color (or any other flawed) discourse may involve taking non-referring terms to be meaningless or thinking that color discourse has little, if any, utility.

[13] Descriptive fictionalists, by comparison, hold that the target discourse is already treated as a fiction, and as such it is not strictly speaking false. According to them, although ordinary people seem to be expressing propositions that commit them to the existence of color properties when they employ the discourse in question, in actuality they engage in some kind of pretense. To see this let us suppose that an ordinary person utters the following statement S:

       S: "Lemons are yellow"

The descriptive color fictionalist would say that when the ordinary person utters statements like S, he or she is saying something true, but not because there *are* colors. Rather, because S is short for P*:

P*: "In the fiction, lemons are yellow"

So, although our ordinary color discourse is assertoric, ordinary people do not have false metaphysical beliefs about colors because they are merely pretending that colors exist (as the hidden operator 'in the fiction' indicates). The descriptive fictionalist is thus merely describing our practices, she is not proposing that we change them. See also Gatzia (2007).

[14] Joyce (2001), p. 185.

world and the false, non-negotiable[15] propositions.[16] More specifically, my proposal consists of three components: the *base discourse*, the *fiction*, and the *bridge laws*[17] that connect the former to the latter.

The *base discourse* is the unproblematic and literally interpreted part of our discourse –that is, it must not contain any positive claims about color although it could contain some color terminology –and it includes the *Dual-Process theory*[18] of color vision. This theory consists of two stages. The first is the *trichromatic-process* stage, which pertains to the activity of the three types of receptors, *i.e.*, cones, each type of which has different peak sensitivity. The second is the *opponent-process* stage, which pertains to the photoreceptors linked together to form three opposing channels, blue/yellow, red/green, and black/white. Both stages are

[15] I am using Joyce's (2001) conception of non-negotiable propositions here. Non-negotiable are those propositions that must be satisfied if something is to be a color property. By contrast, propositions that we could reject without having to deny that something is a color property are called 'negotiable'. Joyce (2001) uses what he calls the 'translation test' to determine which propositions in a give discourse are negotiable and which are not: whether a proposition is negotiable or non-negotiable depends on whether it plays a determinate role in deciding whether the translation goes through. To see this, consider a community of non-English speakers who seem to have a concept that appears rather like our concept of color, call it 'chroma'. Suppose further that we find that they do not endorse one, or perhaps more, of the propositions we accept. If this is sufficient for rejecting that "chroma" should be translated into "color", then these propositions are *non-negotiable*. But if the fact that they do not endorse one, or more, of those propositions is insufficient for rejecting that that the translation goes through, then they are *negotiable*. Johnston (1997) seems to be making the same distinction when he talks about 'core' and 'peripheral' beliefs.

[16] Assuming that the fiction is incomplete, the rest of the ordinary color discourse will be true-according-to-the-fiction, where *according to the fiction* is to be understood in terms of derivability in the above way. I am grateful to Mark Heller for valuable conversations and advice in this matter.

[17] The term 'bridge laws' often brings to mind philosophy of science, and in particular Carnap's reductive models. However, my proposal is not to be understood as a reduction. All I mean by 'bridge laws' is that there is a way of connecting the false utterances in the fiction with the base discourse in order to determine which color utterances are fictionally true (or appropriate) and which are not. And since reduction requires that we go from truths to truths, my proposal cannot be a reductive one.

[18] The term is taken from Palmer (1999), p. 110. Notice that even color realists seem to recognize that if we are to solve the problem of color, we must appeal to this theory. See, for example, Hilbert and Byrne (2003) and McLaughlin (2003).

essential in explaining what is known about color vision. The trichromatic-process stage allows us to explain phenomena at the photoreceptor level.[19] The opponent-process stage, on the other hand, allows us to explain phenomena that result from the neural interconnection among outputs of the photoreceptors. The dual-process theory thus allows us to explain a variety of phenomena in visual perception, including why we can create the entire visual spectrum by combining only three wavelengths, the appearance of after-images, and so on.[20] The base discourse must also include color experiences and color categories. Our color categories are far less precise than our individual color experiences. As a result, we are able to effectively communicate with others despite the fact that our individual color experiences can be, and often are, significantly different. Lastly, we must allow that the base discourse contains some color sentences since we want to be able to say, for example, that *literally speaking* "No red objects exist." A restriction to positive statements is, of course, needed since in most vocabularies it will be possible to formulate both a sentence and its negation, and the fictionalist need not suggest that both of these are false (Nolan *et al.*, 2005). Sentences that cannot be part of the base discourse because they are literally false are of the form 'a is red', 'b is green', and so on.

The *fiction* will contain the false theory of color we ordinarily accept (namely, that physical objects are colored) and positive color statements. The fiction will be linked to the base discourse via the *bridge laws*. These principles will allow us to "go from information about the world and the objects in it to

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[19] See Hardin (1993) and Palmer (1999).
[20] Other future findings that help explain the various idiosyncrasies of our visual system can also be included in the base discourse.

conclusions about the same subject matter, taking a detour through the fiction."[21]

The following bridge laws are proposed as the first approximation of complex

laws that will connect the fictional discourse with the base discourse:[22]

(BL1) (In the fiction) bananas are yellow if and only if (in typical conditions) bananas would cause the B/Y channel of an (human) observer to be in the state of excitation producing experiences that ordinary people would classify under the color category 'yellow'.

(BL2) (In the fiction) sapphire is blue if and only if (in typical conditions) sapphire would cause the B/Y channel of an (human) observer to be in a state of inhibition producing experiences that ordinary people would classify under the color category 'blue'.

(BL3) (In the fiction) tomatoes are red if and only if (in typical conditions) tomatoes would cause the R/G channel of an (human) observer to be in a state of excitation producing experiences that ordinary people would classify under the color category 'red'.

(BL4) (In the fiction) grass is green if and only if grass would cause (in typical conditions) the R/G channel of an (human) observer to be in a state of inhibition producing experiences that ordinary people would classify under the color category 'green'.

It is tacitly assumed here that the observers are in a neutral state of adaptation.

Typical conditions are to be understood as situational in the sense that they

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[21] Nolan *et al.*, (2005), p. 313.
[22] These laws are not necessary but rather contingent since things could be different in other possible worlds.

depend on our purposes and what are we looking for.[23] This is consistent with the fact that assigning colors to objects requires that we specify our "particular interest and purpose".[24] For, as Hardin (1993) cautions us,

> [g]iven a particular observer in a particular adaptation state and a particular standard conditions, a color can be assigned to an object as precisely as the observer's perceptual condition warrants, but we cannot expect the assignment to remain the same when the set of conditions or the observer's adaptational state is changed. (81)

This is particularly troubling for dispositional accounts of the colors that rely on 'standard observers' and 'standard conditions' (McLaughlin, 2003). The only way to avoid this problem is to relativize colors to observers and circumstances (Cohen 2003 and 2004). This move, however, fails because it entails that *all* color experiences are veridical. The color fictionalist, on the other hand, maintains that there are pragmatic conditions (which go beyond the semantics of color discourse) that allow a range of normal observers and typical conditions depending on the purpose of the procedures. For example, the fact that the appearance of contrast colors depends on their immediate surroundings presents a difficulty for many realists since they must incorporate the objects' immediate surroundings in their analysis.[25] Yet, from a purely phenomenological point of

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[23] Assumptions about adaptation, specifications as to what counts as typical conditions, etc., could be easily incorporated into the bridge laws.

[24] Hardin (1993), p. 81.

[25] Contrast colors, i.e., brown, olive, black, white, navy blue, *etc.*, differ from other colors, like red, blue, *etc.*, in that their appearance is depended on the background. Realists like Hilbert and Byrne who want to identify colors with surface spectral reflectances (SSR) cannot provide a unified account because the appearance of the contrast colors depends not only on the object's SSR, but also on its surroundings. The only reason that a surface looks, say, brown rather than orange is that the light that reaches the eye is a function of

view, contrast colors do not differ from the rest of the colors. The color fictionalist is able to honor this intuition since the dual-process theory can treat color experiences uniformly by reference to mechanisms operating across space as opposed to time. The bridge laws are thus in place to allow us to go from literal truths to fictional truths and back –they are not intended as an analysis of color properties. These laws also allow us to determine which utterances are *appropriate* and which are *inappropriate*. (I discuss this notion further in § 4.)

Talk of *real* and *apparent* colors, as used in ordinary speech, can also find its place in typical circumstances. For example, we could pretend to distinguish between the apparent colors of an object, say, a banana looking blue through a filter, and its real color, *i.e.*, the colors it seems to have in typical circumstances. However, since the bridge laws express the sloppiness of our ordinary color perception, it is to be expected that they can, and often will, be sloppy. In addition, it is to be expected that they can, and occasionally will, break down; it suffices that we insure that they do not break down most of the time.

To be sure, the bridge laws are not proposed as an analysis of the nature of the colors –that is, they cannot be thought of as reductions since reductions can only take you from truths to truths. Therefore, they must not be confused with dispositional accounts. Color fictionalism is an approach towards preserving our flawed color discourse. This explains why, unlike the color realist, the color fictionalist can tolerate the sloppiness or the occasional breaking down of the bridge laws. It also explains why, unlike the color realist, the color

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the surface reflectance of the object, its surrounding surfaces, and various other variables like illumination, etc.

fictionalist can maintain that 'normal observers' and 'typical circumstances' are relative to the particular interests and purposes.

3. What does the pretense amount to?

I said earlier that fictive judgments should be understood as an act of make-believe.[26] This is because statements made as an act of make-believe have the same content whether they are "used as part of a fairy tale or to foolishly assert something false."[27] It is not the content of the utterance that changes when we utter such sentences as an act of make-believe, but rather the *force* with which they are uttered. This is the point Peter Geach makes in his famous paper entitled "Assertion" when he writes that a "thought may have just the same content whether you assent to its truth or not; a proposition may occur in discourse now asserted, now unasserted, and yet be recognizably the same proposition."[28] Take, for example, the sentence "Apples are red." Whether this statement is uttered with or without assertoric force, its meaning remains unchanged; what changes is the *force* with which it is uttered.[29] Since the presence or absence of assertoric force doesn't affect the content of statements,[30] the fictionalist can maintain that there is no relevant difference between statements that are uttered as an act of

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[26] Here I have in mind the conception of fiction discussed in Currie (1990) and Joyce (2001).

[27] Joyce (2005), p. 293.

[28] Geach (1965), p. 449.

[29] See also Currie (1986) and Joyce (2005).

[30] Geach (1965), also points out that prefixing statements with "It is true that…" or "There exists an A" will not help to change the meaning of the proposition they express although it may give them assertoric *force*. It is not clear to me whether in fictional discourse prefixing statements with "It is true that…" or "There exists an A" or even "Yes, I am asserting *p*" would give them assertoric force since it might turn out that this is just another part of the fiction.

make-believe and those that are assertions. This ensures that arguments that are valid remain valid when premises are uttered as an act of make-believe. To see this consider the following example:

(P1): Blueberries are purple
(P2): My sorbet is made of blueberries
(C): Therefore, my sorbet is purple

We have no difficulty saying that this argument is valid when (P1), (P2), and (C) are asserted. But, for the fictionalist who takes them to be uttered as an act of make-believe, (P1), and (C) are *not* assertions. Does this matter? Not at all. When one asserts (P1), one is presenting it is as something that one believes. But when the fictionalist utters it as an act of make-believe, she is not presenting it as something she believes, nor is she saying that others should believe it. She simply pretends that there are colored things when she knows fully well that there are none. As Joyce (2001) rightly argues, the act of make-believe differs from self-deception. When one utters p as an act of make-believe, one knows that p is false but pretends that it is true.[31] Since the content of the propositions expressed by the above statements remain the same, validity is preserved.

4. What is it for something to be fictionally true?

It seems intuitively true that although some color attributions are correct others are not. Any theory of color must be able to preserve this intuition. But since the color fictionalist claims that *all* color attributions are false, the only way she can satisfy this condition is by distinguishing between color attributions that

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[31] See also Currie (1990).

are fictionally true and fictionally false (although, strictly speaking, they are all false). Take, for example, the statement "Elephants are pink". Intuitively, the color fictionalist should be able to say that this statement is incorrect while statements like "Elephants are gray" are correct. The fictionalist can do that by replacing the notion of *veridicality*, which is used by the realist, with the notion of *appropriateness*. Accordingly, sentences attributing colors to things are false, but can be appropriately uttered in ordinary contexts because they are useful. This can be done with the help of the bridge laws.

Since the bridge laws connect the fiction to the base discourse and *vice versa*, the color fictionalist can use them to determine which utterances are appropriate and which are not: utterances that are consistent with the bridge laws are appropriate while utterances that violate them are inappropriate. So, although there is no yellowness, it is appropriate to utter, say, "Bananas are yellow" but inappropriate to utter, say, "Bananas are blue."[32] This is because the bridge laws connect the fictional discourse with the base discourse, which we take to be literally true. To see this consider once again (BL1):

> (BL1) (In the fiction) bananas are yellow if and only if (in typical conditions) bananas cause the B/Y channel to be in the state of excitation producing an experience that ordinary people would classify under the color category 'yellow'.

According to (BL1), in order for the utterance "Bananas are yellow" to be appropriate certain conditions in the world must obtain. Assuming that the

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[32] It is also appropriate to say that some bananas are red since some bananas would cause the R/G channel to be in a state of excitation producing experiences that we would classify as 'red'.

subject's visual system has the appropriate types of cones, the B/Y channel of her visual system must be in the state of excitation producing an experience that ordinary people would classify under the color category 'yellow'. Thus, if the right hand side of (BL1) obtains, it is inappropriate to say that bananas are blue. The same can be done with the rest of the bridge laws. In general, it can be said that if the right hand side of (BL1) obtains, it is appropriate to say that objects are yellow. In addition, the color fictionalist can determine what is appropriate for subjects that have less than two (*e.g.*, dichromats) and more than three types of cones (*e.g.*, tetrachromats) by creating bridge laws that reflect their distinct constitution. Thus, although the color fictionalist denies that there are color properties, she can preserve our color discourse because she believes that the appropriateness of an utterance comes apart from the truth of the literal interpretation.

5. General Worries

Thus far I have outlined a theory that will allow us to continue using our ordinary color discourse even if it turns out that there are no colored objects. In what follows, I discuss some potential worries for this proposal and subsequently offer some responses on the color fictionalist's behalf.

5.1. If there are no colors, how do we acquire color concepts?

Jonathan Ellis (2005) argues that an error theory about color is inadequate because the error theorist cannot explain how we acquire color concepts. More

precisely, he argues that "[o]n no plausible account of propositional content can an error theorist explain how we acquire colour concepts."[33] Although there are many views of propositional content that account for the "normativity of concept possession", Ellis argues, none is available to the error theorist. To see this let us consider the following sentence:

> S: "The banana is yellow"

Let us assume that S expresses the following Russellian proposition:[34]

> P: <Banana, yellowness>

Since the error theorists claim that there are no colors, says Ellis, nothing instantiates yellowness. Thus, the error theorist must say that S expresses P* below rather than P above:

> P*: <Banana, Ø>

Notice that in P* the placeholder for property has an empty extension, *i.e.*, Ø, which indicates that 'yellow' fails to denote. This is Ellis' reason for saying that the error theorist cannot explain how we come to acquire color concepts using *any account of propositional content*. The proviso (marked in italics) is very important in understanding Ellis' argument: his claim is *not* that the error theorist cannot provide an explanation concerning color concept formation, but rather that she cannot provide an explanation using some account of propositional content. It is this proviso that allows him to conclude that error theory about color is unattainable. This, however, cannot be right.

First of all, Ellis' inference is problematic since the error theorist could deny that sentences express propositions. More importantly, Ellis' argument is

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[33] Ellis (2005), p. 55.
[34] The analysis will be similar for any other type of proposition.

not only applicable to error theory about color but rather to *every* error theory. The error theorist about morality, for example, would face the same problem were he to attempt to explain how we acquire moral concepts like 'good' using some account of propositional content. Similarly, the error theorist about Euclidean space would find it difficult to explain how we acquire concepts like 'parallel lines'. The same can be said about a host of other concepts, including 'bitter', 'solid', and so on. It thus appears that explaining how we acquire concepts that have empty extensions is not a problem unique to the error theorist about color. This gives rise to the following question: if no account of propositional content can accommodate concepts that have empty extensions, why think that the problem lies with the error theory about such concepts? Why not think instead that the problem is a result of the limitations of these propositional accounts?

Ellis attempts to deny that his argument could be applied to *every* error theory, although he admits that it could be generalized to error theories "concerning solidity…or goodness".[35] He argues that a "similar argument would not be effective, for instance, against error theories concerning judgments in which the concept *witch* is applied to someone". This is because "an error theorist about witches has an explanation available to her that the error theorist about colour does not. In the case of *witch*, it is natural to suppose that we form the concept through concatenation, *i.e.*, by constructing it from other concepts that we already possess" (69). However, this is problematic since Ellis' explanation of how we come to form concepts like 'witch' does not tells us how we come to

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[35] Ellis (2005), p. 70.

form concepts that cannot presumably be formed through concatenation.[36] In addition, it is unclear why Ellis thinks that unless the error theorist can provide an explanation that is consistent with some plausible account of propositional content, error theory is false, especially when other explanations can be available to her. The error theorist about color, for example, could argue that color concepts are acquired from color appearances; we acquire the concept 'red', for example, due to the fact that certain objects *look red to us* even if no objects are the way they appear to us. This explanation is consistent with the fact that we learn about the colors of things by first pointing to objects and then uttering the appropriate color terms. This suggests that having the relevant color experience is not only prior but also essential to the formation of color concepts. Color properties need not feature in our explanations since color appearances are explainable in purely subjective terms. (At the same time, since color appearances suggest that colors are objective, intrinsic, non-relational properties of the surfaces of objects, it makes sense to ask whether anything has these properties and to conduct experiments to provide answers to this question.) But the error theorist could also argue that certain concepts are not acquired –this is not to say that they are innate but rather they are the result of some evolutionary process. Joyce (2001), for example, argues that moral concepts like "requirement" and ''forbidden" are not acquired but are rather the product of natural selection. Perhaps the same can be said about color concepts, especially since we now know that the visual system of our ancestors differed dramatically from ours in

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[36] Examples can be drawn from particles of theoretical physics such as the Higgs Boson.

that they had fewer than three types of cones.[37] To reject such explanations on the basis that they are independent of any account of propositional content seems gratuitous.[38] What Ellis ought to say is that all plausible accounts of propositional content are limited in that they cannot account for all our concept formation, *not* that it is impossible to acquire concepts that have empty extensions. If I am right, it follows that this is not a problem for the error theorist but rather for any account of propositional content which fails to explain how we succeed in communicating about, say, *redness*, *bitterness*, *goodness*, and a whole host of other concepts whose acquisition cannot be explained by that account of propositional content.

5.2. Is color fictionalism preferable to realism?

Color fictionalism is indeed preferable to realism for a variety of reasons. Firstly, since color realists take colors to be physical properties of the objects that have them, they must be able to distinguish between color experiences that are veridical and those that are illusory. However, drawing a meaningful distinction between veridical and non-veridical experiences is not as easy as it might seem. The underlying assumption behind color realism is that the primary function of our color vision is to detect the colors. If the realist denies this, he "eliminates motivation for thinking that whatever objective property we have identified with

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[37] On the basis of genetic evidence, scientists believe that some human females have four types of cones.

[38] It seems to me that Ellis rejects this because he assumes a strong notion of externalism about content that one might be inclined to reject. See also Tyler Burge's (1979) "Individualism and the Mental", *Midwest Studies in Philosophy* 4: 73-121.

color is color."[39] However, evidence from psychophysics, physiology, and perception support the view that the primary function of color vision is to discriminate forms and objects, not to detect the colors.[40] What is important in discriminating forms is essentially color differences, *i.e.*, their relations in a given scene. The absolute values of the colors do not play any role in making such discriminations. Given this, it seems unreasonable to let the distinction between illusory and non-illusory colors turns on whether the colors are (correctly) represented. This is a distinction that has to be made within the domain of perception, not by reference to the representation of physical properties. How it is to be made is thus a pragmatic question to which the color fictionalist can provide an answer.

Secondly, the fictionalist's position is also consistent with our color language. One important point that sometimes goes unnoticed in discussions about illusory experiences is that utterances describing such experiences have the same semantic structure as utterances describing what realists take to be veridical color representations. To see this consider the following sentences:

(1) "I see a red apple"

(2) "I see a pink elephant"

(3) "I see a blue circle on the white wall"

(1) is typically uttered when one has an experience of a physical object, in this case an apple. (2) could be uttered by someone hallucinating an object while (3)

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[39] Hilbert (1992), p. 9.
[40] Werner and Webster (2002). See also Gouras and Zrenner (1981).

might be used by someone having an after-image of an object. The color

fictionalist can include utterances like (1)-(3) in her discourse since she can

explain illusions and after-images by reference to the dual-process theory. She

can accept that in ordinary contexts we can talk about hallucinatory objects or

afterimages as having colors.[41] For example, she can say that it is appropriate to

utter "I see a pink elephant" or "I have a blue after-image that moves with my

eyes", and so on. Or we can ask questions like "What color is the after-image you

are seeing?", "What color is the elephant you are hallucinating?", and so on.

After all, as (2) and (3) suggest, we do talk about them in this way. The color

realist has to explain why our ordinary color discourse fails to capture the

differences between (what he takes to be) veridical experiences and

hallucinations or experiences of after-images.[42] Unlike the color realist, the color

fictionalist has the open-question advantage. It is an open question whether

utterances regarding hallucinatory or illusory color experiences should be

distinguished from utterances pertaining to correct color experiences.

Lastly, the color realist has to give up the idea of there being color

properties *simpliciter* since the appearance of some colors depends on their

immediate surroundings. They are known as *contrast colors* and include black,

white, brown, navy blue, and olive. A surface that looks brown in a given

surrounding, for example, will most probably look orange or yellow upon

eliminating its immediate surrounding, *i.e.*, under the aperture mode of viewing.

Since contrast colors arise only by the contrast of the surrounding colors, it

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[41] See also Maund (2005).

[42] Harman attempts to explain the difference by arguing that the use of the term 'see' is ambiguous. See "The Intrinsic Quality of Experience", *Philosophical Perspectives*, 1990, vol. 4, pp. 31-52.

follows that removing the contrast will deprive us of such colors. This presents the following problem for the color realist: he cannot identify brownness with a perceiver-independent physical property of the surfaces that have them since the reason such surfaces appear brown and not orange is that the light that reaches the eye is a function of, among other things, the surface reflectance of the object, its surrounding surfaces, and various other variables like illumination. Thus, the color realist is forced to reject the claim that contrast colors are non-illusory.[43] But this comes at a high price: he has to reject a whole array of colors. It could be argued that the color fictionalist is in a worse position since she has to reject the *entire* array of colors. However, this is not a problem for the color fictionalist because (a) her theory is consistent with the facts about the world and (b) she is able to preserve our color discourse without having to inflate her ontology.

5.3. The Standard Challenge: is it a threat to color fictionalism?

The standard challenge (which is a general version of the Quine-Putnam indispensability argument and targets primarily mathematical fictionalism) is a point about explanation.[44] It purports to establish the truth of the claim that there are Fs on the basis that the F-theory is explanatory indispensable. In general, the

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[43] Tye (2000), for example, claims that "our ordinary experiences of color place (many) object colors on the surfaces of objects independently of what is going on elsewhere in the surrounding…We experience the redness of a ripe tomato as not involving anything *away* from the facing surface of the tomato as being a *local* feature of that surface…To take a relational view of color is to repudiate this common sense fact." (153) But this gets him into trouble since he goes on to falsely claim that contrast colors *can* be experienced without their immediate surroundings.

[44] See Szabo' (2001). This argument is widely known as the 'indispensability argument'. Note that Szabo' is not targeting *color* fictionalism *per se*, but his argument could be applied to some versions of color fictionalism, albeit not mine.

objection goes, we tend to think that if things look just as if they would look had there been colors, then one explanation is that there are colors. Prescriptive fictionalists, however, deny this explanation while continuing to rely heavily on the color theory that they say is false.[45] Thus, they have no satisfying answer to the standard objection.

There are at least two responses to this objection. One approach is to reject the cogency of the argument. Many philosophers have done just that.[46] The other approach is to deny that the target theory is indispensable. Field (1980), for example, argues that contrary to appearances, mathematical entities are dispensable because mathematical theories do not have to be true in order to be useful in applications; they simply need to be *conservative*.[47] They are useful because they simplify calculations; and since their utility is merely pragmatic[48], Field argues that it does *not* follow from the fact that mathematical entities are useful that they are either true or indispensable. The same argument can be made, perhaps with greater plausibility, about color. It can be argued that the (false) color theory the fictionalist employs is dispensable because every phenomenon that can be explained by reference to it can also be explained without such reference. Nonetheless, the color fictionalist recommends that we

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[45] See Szabo' (2001).
[46] Philip Kitcher (1984) argues that the argument does not show why mathematics is indispensable (see *The Nature of Mathematical Knowledge*, New York: Oxford Press); Penelope Mandy (1992) denies that we ought to have ontological commitments to *all* entities that are indispensable to scientific theories (see "Indispensability and Practice", *Journal of Philosophy*, 89:6: 275-289); and Elliot Sober (1993) argues that mathematics does not receive confirmation from empirical evidence since it is employed by every scientific theory (see "Mathematics and Indispensability", *Philosophical Review*, 102:1: 35-57).
[47] This roughly means that no consequences that follow from mathematics would fail to follow from a nominalistic scientific theory.
[48] Maddy (1997) also aims to undermine the plausibility of the first premise of the Quine-Putnam argument by showing that confirmational holism should be rejected. See "Indispensability and Practice", *Journal of Philosophy* 89:6, 1992; and *Naturalism in Mathematics*, Oxford: Clarendon Press.

continue using it because it is pragmatically useful. Thus, the standard challenge poses no threat to color fictionalism.

5.4. Can the color fictionalist avoid global fictionalism?

The color fictionalist proposes that we do away with colors and instead embrace them as a fiction. However, if we choose to be fictionalists about colors what is to stop us from embracing global fictionalism? To put it another way, can one maintain fictionalism about color properties while avoiding fictionalism about all other properties? The answer is "Yes".

First of all, there are important scientific differences between colors and physical properties like being square or having a negative charge.[49] For example, the latter are explanatory: they can explain a variety of physical phenomena. By contrast, any phenomenon that can be explained by appealing to the colors can also be explained without such appeals. Further, physical properties are basic to the causality of the world in the way colors are not. They can be observed and measured by interacting with the object in multiple ways. As such, they are properties that have a role in the physical world in the way colors do not – particularly because their existence *is* verifiable through experimentation. More specifically, there are methods independent of our vision for measuring the

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[49] Whether all physical properties are intrinsic is another question. In the case of the electron, the consensus seems to be that negative charge is intrinsic. But things get more controversial when it comes to other physical properties. Some, for example, hold that curvature is intrinsic to physical space. Since an object's shape depends on the curvature of the space in which it is embedded, whether shape is intrinsic depends on whether curvature is intrinsic. But others deny that shape is intrinsic since it is always relative to a reference frame thereby denying that curvature is intrinsic. See Graham Nerlich's "Is Curvature Intrinsic to Physical space?" *Philosophy of Science* 46: 65-72.

amount of negative charge in a body or an object's shape. But there are no such independent methods in the case of colors; they have to be defined exclusively in terms of (human) experience. These are some of the reasons the colors are not scientifically respected properties –a fact that even color realists are willing to admit.[50] But although, according to the color fictionalist, the colors are not instantiated and the color theory we employ for our fiction is dispensable, our color discourse is nonetheless pragmatically useful. It is in this respect that color discourse differs from other discourses that are also flawed, *e.g.*, phlogiston discourse. Thus, the color fictionalist can consistently maintain that we should be fictionalists about the colors but not about theoretical entities like phlogiston.

6. Conclusion

I have outlined an account that would allow us to continue using our ordinary color discourse as we have thus far (despite the fact it is flawed). To remedy the seeming oddness of this suggestion, I have prescribed that we stop asserting sentences attributing color properties to objects and instead begin to uttering them as an act of make-believe. Further, by incorporating the dual-theory of color vision in our base discourse, we are able to explain a wide range of phenomena without having to postulate the existence of color properties as they are ordinarily conceived. As presented, the bridge laws have a dual function: they allow us to go from the base discourse to the fiction and back, but they also allow us to distinguish between utterances that are appropriate and those that are not. Lastly, I have presented a number of worries and have argued

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[50] See, for example, Hilbert (1992) and Hilbert and Byrne (2003).

that neither presents a serious threat to my proposal. There is thus little reason to shy away from it.

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