Colour Fictionalism

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1. Colour and Colour Theories

Colours play an important role in various aspects of our lives including social, political, psychological, and epistemological. Despite their pervasiveness, however, their nature remains as elusive as ever. The theories most frequently appearing in the literature fall under three general rubrics: realism, subjectivism, and eliminativism. Realism says that colours are physical properties of objects. Some realists identify colours with ways of altering light (e.g. Hilbert and Byrne 2003, Tye 2000) while others identify them with bases of dispositions to cause colour experiences (e.g. Jackson 1996, McLaughlin 2003). Subjectivism says that colours are dispositions to cause colour experiences (e.g. Johnston 1992). Eliminativism says that despite appearances objects are not actually coloured.[1]

Colour realism is attractive for a variety of reasons. Firstly, it seems to offer the best explanation for colour phenomenology: what best explains why objects look coloured is that they are coloured. Secondly, it preserves the intuition that colour experience does not involve a massive and systematic error. Thirdly, it is consistent with the claim that colour discourse is largely true since it maintains that colour predicates pick out colour properties of objects. Many

[1] See Hardin 1988, Maund 1995, Arstila 2005.

philosophers and colour scientists, however, argue that despite its initial appeal, colour realism is false; nothing is actually coloured[2].

Those who find both realism and eliminativism unattractive, embrace some form of subjectivism[3]. Many subjectivists maintain that colours should be identified with dispositions (e.g. Johnston 1992). But since dispositions are not causally efficacious, they do not seem to be good candidates for colour[4]. Realists, on the other hand, seem to think that eliminativism is a better alternative than subjectivism. For example, Frank Jackson claims that if realism is false, «we should be eliminativists about colour. We should not embrace subjectivism» (Jackson 2007: 170). Eliminativists welcome this stance since they deny that objects are coloured. C.L. Hardin, for example, argues that there is no reason to postulate that colours are physical properties of objects:

> Realists hold that the world contains both spectral reflectances and experiences of color. Color antirealists agree, and point out that spectral power distributions and color experiences are jointly sufficient to explain the gamut of chromatic phenomena. We need not invoke the colors of commonsense realism at all. So why should we include them in our ontology? (2003: 201-202)

Mark Johnston accepts Hardin's claim that colour realism is false but rejects Jackson's claim that eliminativism is a better alternative than subjectivism. He argues that eliminativism is unacceptable because it would render our «core» beliefs about colour false, thereby depriving us of colour discourse:

[2] See Hardin 1988, Maund 1995, Thompson 1995, Arstila 2005, Cosmides and Tooby 1995.
[3] See Boghossian and Velleman 1989, Johnston 1992, McGilvray 1994.
[4] See Jackson 1996.

[W]ere such [core] beliefs to turn out not to be true we would then have trouble saying what they were false of, i.e., we would be deprived of a subject matter rather than having our views changed about a given subject matter. (2001: 221)

Johnston is not explicit about which of our colour beliefs are core and which are not, but claims that typically «there are many legitimate ways of drawing the core/periphery distinction» (2001: 221). He argues that rejecting peripheral beliefs about colour is unproblematic since doing so would not deprive us of colour discourse. Rejecting core beliefs, on the other hand, is problematic precisely because it would deprive us of colour discourse. Subjectivism rejects only peripheral beliefs about colour. Therefore, it does not deprive us of colour discourse. Eliminativism, on the other hand, rejects both core and peripheral beliefs about colour. Johnston thus concludes that eliminativism cannot preserve colour discourse and as such it is not an adequate account of colour.

The aim of this paper is to challenge Johnston's claim that eliminativism cannot preserve colour discourse. Given that serious problems have plagued both realism and subjectivism about colour, it behooves us to examine whether eliminativism is a plausible alternative. I shall argue that a particular version of eliminativism, i.e., prescriptive colour fictionalism, is a viable alternative since it can preserve colour discourse in the absence of colours.

2. Colour Fictionalism

Colour fictionalism is a species of error theory. An error theory about colour can be understood as a conjunction of two claims: a *conceptual* and an

ontological[5]. According to the conceptual claim, colours are physical properties of external objects that cause colour experiences in normal perceivers.[6] According to the ontological claim, there are no such properties.

Colour fictionalism comes in two varieties: descriptive and prescriptive. Descriptive fictionalism says that the target discourse (in this case, colour discourse) is *already* treated as a fiction. Even though ordinary people seem to be expressing propositions that commit them to the existence of colour properties, in actuality they engage in some kind of pretense. Accordingly, when ordinary people utter statements ascribing colours to objects, e.g., 'Lemons are yellow', they express propositions of the form 'In the fiction, lemons are yellow'. Descriptive fictionalists thus maintain that ordinary people do not have false metaphysical beliefs about the colours since they are merely pretending that objects are coloured (as the hidden operator 'in the fiction' indicates).

If ordinary colour discourse is already treated as a fiction, we should expect to find that ordinary people treat colour discourse just as they treat any other fictional discourse. But they do not. It seems obvious that when ordinary people talk about fictional characters like Sherlock Holmes, they engage in some kind of pretense. After all, they do not believe that Sherlock Holmes is a real flesh and blood person. In this case, descriptive fictionalism seems to correctly describe the practices of ordinary people: utterances like 'Sherlock Holmes is a detective', in the mouths of ordinary people, seem to express propositions of the form 'In Conan Doyle's fictional works, Sherlock Holmes is a detective'. However, this is not so in the case of colour. Ordinary people do not seem to

[5] See Mackie 1977, Van Fraassen 1980, Maund 1995.
[6] There is no consensus regarding the nature of colour properties. Eliminativists deny that the properties we ordinarily identify with the colours are instantiated.

engage in some kind of pretense. They rather seem to believe that objects are, in fact, coloured. This suggests that ordinary colour discourse is assertoric, meaning it expresses beliefs[7]. Consequently, if colour eliminativism is true, ordinary people have false metaphysical beliefs about colours.

Prescriptive fictionalists recognize that colour discourse entails or embodies a theory that is false, and recommend that we should «carry on employing the discourse, at least in many contexts, as if this were not the case» (Joyce 2001: 185). Doing so requires that we replace the act of assertion with the act of make believe so as to continue expressing propositions like 'Lemons are yellow' without assenting to their truth. This allows the content of statements ascribing colours to objects to remain unchanged. What changes is the force with which these statements are uttered. This is consistent with Peter Geach's claim 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» (1995: 449). For example, 'Lemons are yellow' may be uttered with or without assertoric force. In either case, it expresses the same proposition, namely 'Lemons are yellow'. Prescriptive fictionalists maintain that when such statements are uttered with assertoric force, they express false propositions. Nevertheless, they recommend that we carry on employing the discourse, in most contexts, as we have thus far, not because it entails or embodies a theory that is true, but rather because it entails or embodies a theory that is useful[8].

[7] Realists generally accept this claim since it is consistent with their view. For a detailed discussion about the features of an assertoric discourse see Joyce 2001.
[8] As we will see in § 4, saying that a theory is useful need not entail that it is true.

As Joyce notes, the act of make believe differs from self-deception. When one utters a proposition *p* as an act of make believe, one knows that *p* is false but pretends that it is true[9]. Self-deception, by contrast, involves asserting *p* while believing that *p* is true. Fictive colour discourse, by its very nature, mimics ordinary discourse. Nevertheless, fictive discourse is distinguishable from ordinary discourse. Since those who engage in make believe do not really believe the fictive judgments they make –they only pretend (within less critical contexts) that they do –they can step out of make believe when pressed. To see this suppose that upon talking about lemons, I utter 'Lemons are yellow'. Suppose further that you, knowing that I am a colour fictionalist, find my utterance puzzling enough to ask: "But you don't *really* believe that lemons are coloured, do you?" I, as a sincere colour fictionalist, despite having just uttered an indicative statement involving lemons being yellow can reply "No, of course not". In this more critical context, I am able to step out of make believe and explain that I was not asserting that lemons are yellow but rather pretending that they are coloured. Such context shifts allow one to easily move from fictive to ordinary discourse and back. However, no such shifts are possible in cases of self-deception[10]. The subject of self-deception will defend her belief not only in ordinary but also in more critical contexts.

Prescriptive fictionalism has three components: the *base discourse*, the *fiction*, and the *bridge principles*[11] that connect the former to the latter[12]. The *base*

[9] Joyce 2001. See also Currie 1990.
[10] For a lengthy discussion regarding the distinction between self-deception and the act of make believe see Joyce 2001.
[11] Initially, I used the term 'bridge laws' (see Gatzia 2007 and forthcoming). However, the term 'bridge laws' often brings to mind Carnap's reductive models. Since my proposal is not supposed to be reductive, 'bridge principles' is a more suitable term.

discourse contains literal truths. Initially, I proposed that the base discourse contain the following: the *Dual-Process Theory*[13] of colour vision, colour experiences, colour categories, and negative colour claims[14]. The dual-process theory consists of the *trichromatic-process* stage[15] –which pertains to the light-sensitive photoreceptors in the retina –and the *opponent-process* stage –which pertains to the neural components forming three opposing channels, blue/yellow, red/green, and black/white. Both stages are essential in explaining colour phenomenology. However, more is needed to explain how we manage to communicate effectively about the colours of things given that individual colour experiences can, and often do, differ significantly. Colour categories provide a suitable explanation: since colour categories are far less precise than our individual colour experiences, they allow us to effectively communicate with others even when our experiences vary significantly. Lastly, expressing some literal truths such as "No green objects exist" required that the base discourse contains some colour claims. However, the base discourse cannot contain any positive claims since the colour fictionalist maintains that they are literally false[16]. For example, statements of the form 'a is red', 'b is green', etc., cannot be included in the base discourse.

The *fiction* and the *bridge principles* do contain positive colour claims when combined with the base discourse. The fiction contains the false theory of colour we ordinarily accept, i.e., physical objects are coloured. It thus includes positive claims of the form 'a is red', 'b is green', etc. A restriction to positive claims is

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[12] See Nolan, Restall, West 2005.
[13] The term is taken from Palmer 1999: 110.
[14] See Gatzia 2007 and forthcoming.
[15] See Hering 1964.
[16] See Nolan, Restall, West 2005.

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[17]. The bridge principles connect the fiction to the base discourse. They thus allow us to go from information about the world to conclusions about the same subject matter, taking a detour through the fiction[18]. The following bridge principles were initially proposed as the first approximation of complex principles that would connect the fiction to the base discourse, and vice versa[19]:

> (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 colour category 'yellow'.
>
> (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 colour category 'blue'.

Similar principles were constructed for red and green. It was assumed that observers are in a neutral state of adaptation. Typical conditions were supposed to be understood as situational –that is, they depend on our purposes. Further assumptions about adaptation, specifications as to what counts as typical

[17] See Nolan, Restall, West 2005.
[18] Bridge principles are supposed to be contingent since things could be different in other possible worlds.
[19] See Gatzia 2007 and forthcoming.

conditions, etc., could have easily been incorporated in these principles. It should be stressed that the bridge principles are not proposed as an analysis of the nature of the colours. Reductive principles can only take us from truths to truths. Bridge principles, on the other hand, can take us from falsehoods to truths and back. This is, partly, what distinguishes prescriptive fictionalism from dispositional accounts of colour.

I now think that there is another, perhaps better, candidate for the base discourse. Instead of using the dual-process theory, which can be restrictive and, perhaps even inconclusive, we should use «high-level statistical constructs build out of correlations between colour experiences and other phenomena»[20]. Johnson and Wright (2006) use this framework to argue that colours can be associated with high-level statistical constructs. They too accept that colour attributions would be largely untrue if realism were false, but argue that colour discourse is indispensible since many «areas of the cognitive sciences, biology, and even such fields as industrial engineering employ colour predicates in stating lawlike generalizations about the phenomena within their domain» (2006: 142). Echoing Johnston, they argue that an adequate theory of colour must be able to preserve colour discourse. However, they assume that eliminativism is not up to the task. Since they deny that colours can be identified with either physical properties of objects or dispositions to cause colour experiences, they propose that the best we can do is to associate colours with high-level statistical constructs. As they note, however, they are not proposing a *philosophical*, but rather a *scientific*, theory of colour:

[20] Johnson and Wright 2006: 140.

Importantly, we regard..[our]…theory of color as 'scientific' rather than 'philosophical' because the theory is not designed to give the metaphysical essence of colors, or to provide a conceptual analysis of color, or to accomplish many of the other tasks that have been assigned to traditional philosophical theories of color. Rather than telling us what colors are, the theory expresses what science tells us about colors. As we've seen, color science shows that colors are not easily captured in other terms –they are multiply realizable both microphysically and in terms of their spectral reflectance properties, etc. So at present we are not entitled to identify colors with some particular physical property, or any other relatively basic type of property. The best we can do is associate colors with a certain set of statistical regularities. (2006: 159)

Even though their theory of colour is not philosophical, it can nevertheless be included in the base discourse of the philosophical theory I have proposed. Standard statistical methods that combine various data to extract latent variables can be used in the base discourse. High-level statistical constructs can be derived from «statistical correlations between various kinds of environments and the color experience of various species»[21]. Scientists use such standard methods to explain a wide range of phenomena that cannot be observed directly such as anxiety. Although anxiety is a second-order latent variable and as such it cannot be observed directly, it can nevertheless be measured in the sense that it can be derived from other lower-order latent variables, which can in turn be derived from the actual data. Third-order latent variables such as self-perception can also be derived from second-order latent variables such as anxiety, attitudes, and self-

[21] Johnson and Wright 2006: 159.

efficacy[22]. Since such statistical models pertaining to colour would contain literal truths, they can be included in the base discourse. In particular, the base discourse would state certain statistical regularities that would be connected to the fiction via the bridge principles. The bridge principles can thus take us from information about the world to conclusions about the same subject matter, taking a detour through the fiction. Moreover, this theory has a virtue which is «alien to related approaches»[23]:

> combined theory of base discourse, bridge principles, and fiction has a uniform interpretation. As a result, the combined theory is closed under ordinary logical consequence. There is no difficulty explaining the validity of reasoning which detours through the fiction. (Nolan, Restall, West 2005: 314)

The proposed account allows us to have our cake and eat it too: it allows us to carry on employing colour discourse, at least in many contexts, as if it did not entail or embody a false theory. Therefore, pace Johnston, eliminativism about colour need not deprive us of the subject matter.

3. Advantages For Colour Fictionalism Over Colour Realism

Explanatory Power. There are too many possible physical properties that can be causally responsible for colour appearances. Different colour appearances can be caused by homogeneous physical properties while the same colour

[22] See Karen Lawrson 2007: *Structural Equation Model Examining Students prior to Mathematics, Experiences, and Impact on their Current Statistic's Self-Perception: A Methodological Study*, Doctoral Thesis, UMI Number: 3279480.
[23] Nolan, Restall, West 2005: 314.

appearances can be caused by heterogeneous physical properties[24]. In addition, it is well known that some colour appearances depend entirely on the immediate surrounding of the objects –as is the case with contrast colours –while others do not[25]. Lastly, there are widespread colour variations among normal perceivers[26]. Such cases present difficulties for reductive colour realism since it aims to identify colours with physical properties of objects. Colour fictionalism, on the other hand, can use statistical models in its base discourse. It can thus allow us to talk about colours precisely in accordance with the latent variables extracted from the scientific data, which takes into account a scientifically observed degree of variation[27]. In addition, the base discourse can determine which colour attributions are true (in the fiction) and which are false without reference to colour properties[28]. It follows that the proposed fictionalist account has greater explanatory power than colour realism.

Colour Vision. Colour realists maintain that the primary function of our visual system is to track colours (or to discriminate among different physical stimuli which are to be identified with the colours)[29]. However, this claim is inconsistent with evidence from physiology and psychophysics. Empirical findings show that the primary function of colour vision is not to track colour properties, but rather to recognize patterns such as objects and forms[30]. Empirical findings from neuroscience provide further support for this claim[31]. Gouras, for

[24] See Nassau 1997.
[25] Hardin 1988.
[26] See Kuehni 2004 and Webster et al. 2000.
[27] See Johnson and Wright 2006.
[28] I show how this works in Gatzia forthcoming (a).
[29] See Hilbert 1992, Tye 2000, Hilbert and Byrne 2003.
[30] See Werner and Webster 2002.
[31] Gouras and Zrenner 1981.

example, argues that since only a relatively small proportion of cells in our visual cortex have any wavelength selectivity, it follows that «much of the neural machinery in the visual cortex is used for pattern recognition rather than color vision»[32]. Colour fictionalism is not committed to any particular account of colour vision. Thus, unlike colour realism, it is consistent with our most current scientific findings.

Unity. Different species see different colours. Bees, for example, see ultraviolet colours while humans do not. Such variations across species present serious problems for colour realism since they limit its inquiry to colours as experienced by a single species, namely humans. For this reason, most colour realists accept some version of anthropocentric realism[33]. However, as Matthen notes, our experience cannot give us a proper grasp of colour because «we have access only to one kind of color experience. Humans see in color. But so do other animals» (1999: 47). Having a complete grasp of colour requires being inclusive of the colour experiences of various species. This, however, is not possible since «there is neither an *experienced* nor a *natural* unity that determines the membership of the class denoted by 'red, blue, green, etc,' in a way that properly accommodates differences amongst the animals that see in color» (Matthen 1999: 47). This forces colour realists to limit the scope of their inquiry to colours as experienced by humans[34]. Colour fictionalism, by contrast, can be inclusive of the

[32] The quote is from an online paper by Peter Gouras titled "Color Vision" (See http://www.webvision.med.utah.edu/Color.html, particularly the section titled "Color and Form"). See also Gouras and Zrenner 1981.
[33] See Hilbert 1987.
[34] Instead of rejecting colour realism, Matthen proposes an account of colour vision that purports to be inclusive of the colour experiences of other species.

colour experiences of other species since actual data pertaining to different species will yield latent variables associated with their colour experiences.

4. Is Colours Fictionalism too Good to be True?

I have argued that prescriptive colour fictionalism has various advantages over colour realism. Many, however, are skeptical about prescriptive fictionalism. Szabo'-Gendler, for example, argues that prescriptive fictionalism is an absurd position since it recommends that we utter sentences we do not believe. But to do so, he argues, would amount to assenting to «Moorean sentences such as 'There are Fs, but I do not believe that there are Fs'» (2001: 293).

This argument targets a specific kind of prescriptive fictionalism, which Szabo'-Gendler calls 'neo-conservativism'. The neo-conservative fictionalist denies that the theory that says that there are Fs –call it the F-theory –is true and embraces a superior theory that is inaccessible to us (although it may be accessible to creatures with superior cognitive capacities than ours)[35]. Szabo'-Gendler argues that the neo-conservative fictionalist cannot explain why assenting to Moorean sentences is absurd:

[In] having embraced the existence of a superior theory that is inaccessible to us, neo-conservative fictionalists have tacitly committed themselves to the possibility of a certain

[35] Szabo'-Gendler envisions a sophisticated creature who has superior cognitive capacities than humans and is able to comprehend the theory that is superior to the F-theory. However, this creature cannot explain this theory to us because we would be unable to comprehend it. Using this set up, he argues that there is a context in which a Moorean sentence could be uttered assertively without absurdity. Thus, contrary to our intuitions, the neo-conservative fictionalist would have to admit that there is *some* context in which it is not absurd to utter assertively a Moorean sentence. But since this cannot be right –for, there is *no* context in which it is not absurd to utter such sentences assertively –it follows that neo-conservative fictionalism is false.

intermediate position between immersion and critical reflection. (2001: 302.)

Thus, the neo-conservative fictionalist cannot say either that «there is…room in the middle» or that we are either «immersed in the game of make-believe or that we are evaluating it from without» (2001: 302). I agree with Szabo'-Gendler that this fictionalist position is perplexing, so I will not try to defend it. Rather, I shall argue that this problem does not arise for the account I have proposed.

The proposed account does not recommend that we assent to propositions we do not believe. It rather recommends that we replace assertion with the act of make believe. In this view, when one utters "There are Fs", one is not assenting to the proposition that there are Fs. Rather, one is engaging in an act of make believe –that is, one pretends that there are Fs. Therefore, the problem that might arise for the account Szabo'-Gendler is criticizing does not arise for the proposed account. To see this suppose that I utter "There are Fs, but I do not believe that there are Fs." Although that would seem odd, it would not be absurd since it would involve a context shift. When I utter "There are Fs" I am merely pretending. But when I utter "I do not believe that there are Fs" I am asserting a true proposition. I thus move from the ordinary context, in which I utter the first conjunct, to a more critical context, in which I utter the second conjunct.

Szabo'-Gendler acknowledges that this move is available to the proposed account, but insists that fictionalism is an absurd position because it is «encouraging us to continue the use of 'S' in a way that is outwardly indistinguishable from the way we used it before…it is [thus] not clear why we would refrain from uttering assertively 'S but I don't believe that S'» (2001: 301). It is true that, in less critical contexts, fictive discourse is indistinguishable from

ordinary discourse. But, as have shown in § 2, the former discourse can be distinguished from the latter in more critical contexts. Since those who engage in make believe do not really believe the fictive judgments they make –they only pretend within less critical contexts that they do –they can step out of make believe when pressed.

Further, the argument that any theory that encourages us to continue using the discourse in a way that is outwardly indistinguishable from the way we used it before is absurd applies to a variety of speech-acts such as irony, metaphor, or hyperbole[36]. Take irony, for example. When one speaks sarcastically, one implies the opposite of what one says. Suppose that upon meeting a rude person I utter 'She was so polite!' to convey that the person is rude. Although I am uttering a statement that is indistinguishable from the statement uttered without sarcasm, this would not be a good reason for judging a theory of irony to be absurd, especially since there is no trouble distinguishing between what one says and what one implies. Similarly, it is not a good reason for judging fictionalism to be absurd. The fact that fictive discourse is outwardly indistinguishable from ordinary discourse in the ordinary context does not entail that fictionalism is absurd, so long as as they can be distinguished in a more critical context.

Szabo'-Gendler recognizes that some fictionalist accounts such as the one proposed here can appeal to context shifts to resolve such problems, but argues that they are inferior to the neo-conservative account. According to Szabo'-Gendler, only the neo-conservative account has a response to, what he calls, the

[36] I am assuming that metaphor implies a simile based on what was said; irony implies the opposite of what was said; and hyperbole implies an exaggeration of what was said.

'standard challenge', which is a point about explanation[37]. It purports to establish the truth of the claim that there are Fs on the basis that the F-theory is explanatory indispensable. If things look just as if they would have looked had there been Fs, then one explanation is that there are Fs. Szabo'-Gendler argues that although fictionalists explicitly deny this explanation, they continue to rely heavily on the F-theory which they say is false. In particular, Szabo'-Gendler claims that both fictionalists who are agnostic with respect to the F-theory and those who treat it as a fiction to be preserve despite that it is false have no satisfactory reply to the standard challenge[38]:

> Suppose that the sentences within the F-discourse are underwritten by a theory (the F-theory, for short) that is at least tacitly held by those who competently engage in the discourse. Since the fictionalist believes that we frequently assent to sentences within the F-discourse that are untrue, she must hold that the F-theory is in error. But if the F-theory plays a crucial role in a wide range of explanatory practices, then there is good reason to believe that it is part of our overall best theory. (2001: 294)

One of the reasons Szabo'-Gendler thinks that fictionalists take the F-theory to «play a crucial role in a wide range of explanatory practices» is that he accepts the Quine-Putnam indispensability argument, which says that we ought to have ontological commitments to entities that are indispensable to our best scientific

[37] Szabo'-Gendler attributes the "standard challenge" to Putnam 1971 and Quine 1961. He also refers to it as the "Quine-Putnam challenge". However, it is widely known as the 'indispensability argument'.
[38] Szabo'-Gendler calls the former view "conservative factionalism" and the latter view "radical factionalism."

theories[39]. (It is worth pointing out that this argument has been severely criticized over the years[40].)

What Szabo'-Gendler is not considering is that fictionalists need not accept that the F-theory is indispensible. 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[41]. Mathematical theories are useful, according to Field, because they simplify calculations. Since their utility is merely pragmatic, it does not follow from the fact that they are useful that they are either true or indispensable[42].

The same can be said about the colour theory fictionalists treat as a fiction (to be preserved despite that it is false). Colour fictionalists can argue that contrary to appearances, colours are dispensable because colour theories do not

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[39] The Quine-Putnam argument targets mathematical entities, but Szabo'-Gendler seems to think it applies to most fictionalist accounts. However, he offers no support for this claim. The Quine-Putman argument is the following:

> P1. We ought to have ontological commitment to all and only the entities that are indispensable to our best scientific theories.
> P2. Mathematical entities are indispensable to our best scientific theories.
> C. We ought to have ontological commitment to mathematical entities.

For a detailed discussion see Mark Colyvan's *Stanford Encyclopedia* entry, *Indispensability arguments in the philosophy of Mathematics*.

[40] Philip Kitcher argues that the argument does not show why mathematics are indispensable (see 1984: *The Nature of Mathematical Knowledge*, New York: Oxford Press); Penelope Mandy denies that we ought to have ontological commitments to *all* entities that are indispensable to scientific theories (see 1992: *Indispensability and Practice*, "Journal of Philosophy", 89, 6, 275-289); and Elliot Sober argues that mathematics does not receive confirmation from empirical evidence since it is employed by every scientific theory (see 1993: *Mathematics and Indispensability*, "Philosophical Review", 102,1, 35-57).

[41] This roughly means that no consequences that follow from mathematics would fail to follow from a nominalistic scientific theory.

[42] Maddy also aims to undermine the plausibility of the first premise of the Quine-Putnam argument by showing that confirmational holism should be rejected (see 1997: *Naturalism in Mathematics*, Oxford: Clarendon Press).

have to be true in order to be useful in applications; they simply need to be closed under ordinary logical consequence. Fictionalists can thus maintain that colour theories are useful because they simplify communication[43]. Since their utility is merely pragmatic, it does not follow from the fact that they are useful that they are either true or indispensable. Even colour realists share the belief that the «colors we perceive and talk about…are scientifically uninteresting kinds».[44] Thus, *pace* Szabo'-Gendler, colour fictionalists who treat the colour theory as a fiction (to be preserve despite that it is false) *do* have a satisfactory reply to the standard challenge.

5. Conclusion

I have argued that Johnston's claim that eliminativism about colour would deprive us of ordinary colour discourse is false. In doing so, I have outlined an eliminativist account, i.e., prescriptive colours fictionalism, which can preserve ordinary colour discourse in the absence of colours. In addition, I have shown that it fares better than colour realism and that it is consistent with our most current scientific findings. Lastly, I have defended it against various objections. Its only flaw seems to be that it goes against our intuition that objects are coloured. But since this intuition is not supported by scientific evidence, its flaw is only apparent.

[43] Szabo'-Gendler seems to also accept Putnam's assumption that what leads fictionalists to reject the F-theory is the mere possibility that it can be disconfirmed. This assumption, however, is questionable.
[44] Hilbert 1987: 27. Note that Hilbert denies that this shows that colors are not physical properties of objects.

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