

Colors, Color Relationalism, and The Deliverances of Introspection

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I frame no hypotheses; for whatever is not deduced from the phenomena is to be called an hypothesis; and hypotheses, whether metaphysical or physical, whether of occult qualities or mechanical, have no place in experimental philosophy.

- Sir Isaac Newton, letter to Robert Hooke, 5 February 1675/1676

1. Color relationalism

Let *color relationalism* be that form of color realism according to which colors are constituted (partly) in terms of relations to subjects (possibly *inter alia*).¹ Color relationalism can be usefully

¹ This formulation of the position says nothing about just which sort of relation to subjects is color-constitutive, and thereby makes room for a wide range of different forms of the view. Perhaps the most famous form of color relationalism is the traditional dispositionalist view that colors are identical to objects' dispositions to produce characteristic mental states in (normal) perceivers in (normal) circumstances. Many find this view in Locke, Descartes, and other great moderns; more recent dispositionalists include McGinn (1983) and Johnston (1992). See Cohen (2004, 2009) for a fuller formulation of color relationalism, discussion of its relationships to other views, and defense of the position.

contrasted against non-relationalist views according to which colors are, say, non-relational physical properties of objects (Tye 2000, Byrne and Hilbert 2003).

One (historically important) way to bring out the conflict between these two sorts of views is to ask whether, in cases where subjects appear to disagree in the colors they ascribe to a common object, it must be the case that at most one of the ascriptions can be veridical. For example, suppose that you look at a ripe tomato, that it appears to be red and that you report as much when asked; and now suppose that an alien being, with very different perceptual apparatus, views the same ripe tomato, but that it appears to her to be green, and that she reports as much when asked. Would one of the two reports of the ripe tomato's color have to be mistaken, or is it possible that both of them could be correct?

Anti-relationalist views about color predict that, in such cases of perceptual variation with respect to color, just as in the case where you and I disagree in (say) the shape we ascribe to an object, at most one report can be correct in what it says about the object's color. In contrast, relationalist views predict that, at least in many cases, the (apparently) disagreeing ascribers can both be correct. The relationalist holds that, just as one joke can be funny to you but not to me, and just as one individual can be a sister to you but not to me, so, too, a given stimulus can be red to you but not to me. Precisely because they disagree in their treatments of these cases, instances of perceptual variation have been at the center of disputes between relationalists and non-relationalists for a long time.

2. The introspective rejoinder

Whatever one's ultimate verdict, it seems to us that color relationalism (at least in some of its forms) is an interesting proposal that merits serious consideration by those seeking a realist color

ontology.

In contrast, many have urged that color relationalism should be rejected out of hand because it is unacceptably revisionist of what we naively know to be true about colors on phenomenal grounds.² The thought here is that the view does so much violence to pre-theoretical, phenomenally informed, intuitions about the nature of colors that it amounts to a change in subject matter. To proponents of this thought, it is just obvious to anyone with ordinary color phenomenology and minimal reflective ratiocination that colors are properties that (perhaps unlike *funny* or *sister*) are *not* constituted in terms of a relation to subjects. And if the relationalist metaphysics of color conflicts with widely introspectively available data about the nature of colors, we have no choice but to reject the offending theory. Because it rests on some variety of phenomenal introspection, we'll call this line of anti-relationalist criticism the *introspective rejoinder*.

Many philosophers have been especially confident in pressing versions of the introspective rejoinder against color relationalism. Here are some particularly clear (and otherwise representative) instances:

... consider further the phenomenology of these [color] qualities, that is, their characteristics as revealed, or apparently revealed to observation. In the first place, as we have already noted, they appear to be intrinsic, that is, non-relational, properties of the physical things, surfaces, etc. to which they are attributed (Armstrong 1987: 36-37).

² We do not mean to suggest that the thought we are about to describe is the only source of resistance to color relationalism.

If colours looked like dispositions, then they would seem to *come on* when illuminated, just as a lamp comes on when its switch is clipped. Turning on the light would seem, simultaneously, like turning on the colours.... But colours do not look like that; or not, at least, to us (Boghossian and Velleman 1989: 85).

But surely [relationalism] misrepresents the phenomenology of color perception: when we see an object as red we see it as having a simple, monadic, local property of the object's surface. The color is perceived as intrinsic to the object, in much the way that shape and size are perceived as intrinsic. No relation to perceivers enters into how the color appears; the color is perceived as wholly *on* the object, not as somehow straddling the gap between it and the perceiver. Being seen as red is not like being seen as larger than or to the left of. The "color envelope" that delimits an object stops at the object's spatial boundaries. So if color were inherently relational, ... then perception of color would misrepresent its structure - we would be under the illusion that a relational property is nonrelational. Contraposing, given that perception is generally veridical as to color, colors are not relational... (McGinn 1996: 541-542).

Still, it may be insisted, the relational view of color (or at least some colors, e.g., the achromatic ones) surely goes against ordinary color *experience*. When, for example, a rubber ball looks blue to me, I experience blueness all over the facing surface of the ball. Each perceptible part of the ball looks blue to me. And none of these parts, in looking blue, look to me to have a relational property. On the contrary, it may be said, I experience blueness as intrinsic to the surface, just as I experience the shape of the

surface as intrinsic to it. This simple fact is one that relational approaches to color cannot accommodate without supposing that a universal illusion is involved in normal experiences of color - that colors are really relational properties even though we experience them as non-relational (Tye 2000: 152-153).

(The introspective rejoinder is surprisingly ubiquitous in the literature on color; see also Dancy 1986: 181, Johnston 1992: 226-227, Yablo 1995: 489, Gibbard 2006: 10, and Chalmers 2006: 56-77ff, among many others.)

It will be important to say something about the structure of the objection we are now considering. As we read the quoted passages and other instances of the introspective rejoinder in the literature, it is an objection that consists of two distinct stages. In the first stage, the objector carries out some sort of phenomenal (or perhaps phenomenal-cum-cognitive) introspection on her color experience. In the second stage, the objector goes on to make a judgment about the nature of color on the basis of the data obtained at the first stage. Namely, she makes a judgment to the effect that colors are not, *pace* color relationalism, constituted in terms of relations to subjects (in the way that, plausibly, *funny*, *sister*, *sweet*, or *delicious* are constituted in terms of relations to subjects), but instead are constituted independently of their relations to subjects (in the way that, plausibly, *square* or *one meter long* are constituted independently of their relations to subjects).

The force and frequency with which it has been pressed suggests strongly that many philosophers with otherwise quite different theoretical commitments take the introspective rejoinder to be a convincing argument against color relationalism. We want to argue, on straightforward empirical grounds, that this assessment is unwarranted.

3. Introspection revisited

Presumably, the sort of phenomenal introspection and subsequent judgment that comprise the introspective rejoinder are available to normal adult human beings, and not just professional philosophers. If so, then normal adult human beings should be able to consider matters, arrive at the anti-relationalist judgments expressed in the quoted passages above, and consequently should be committed to rejecting the relationalist-friendly both-right answer to cases of representational variation involving color. As it turns out, however, that's not what happens.

3.1 Methods

We presented 31 participants (7 male) with a counterbalanced series of cases of representational variation involving shape properties (*rectangular, round*), color properties (*red, green*), and gustatory (*sweet, bitter, sour*) properties, as well as cases of representational variation involving the application/non-application of the property *delicious*. Our participants were drawn from an undergraduate introductory logic course at the University of California, San Diego. In these cases of representational variation with two variants, we asked these participants to choose which, if either, variant, is veridical at the expense of the other, or else to say that neither variant is veridical at the expense of the other. In each case the variation was between one human being and a non-human alien visiting earth. To prevent participants from treating the cases as resulting from specifically linguistic differences between the subjects, we provided the following background description to the participants:

Andrew, Abigail, Alexa, and Amos are all aliens from different planets. They learn English by reading books, and attain native fluency. Their use of English words is no more different from yours than that of other native speakers of English is from yours. But

these aliens have different perceptual systems from ours. Consequently, when the aliens visit Earth on a spaceship and talk with their friend Harry the human, they sometimes disagree about whether a given English word applies to something. Your job is to help us settle these disputes.

After this background information, participants received the particular scenarios for the properties of interest. For example, here is one of our scenarios involving color properties:

Andrew the alien and Harry the human view a ripe tomato in good light, at a distance of 1 meter. Harry says that the ripe tomato is red, while Andrew says that the very same ripe tomato is not red (in fact, he says it is green). Which of the following do you think best characterizes their views? (Check one and give a brief justification for your answer.)

1. The tomato is red, so Harry is right and Andrew is wrong.
2. The tomato is not red, so Andrew is right and Harry is wrong.
3. There is no fact of the matter about unqualified claims like 'the tomato is red'.

Different people have different visual experiences when they look at the same object, and it is not absolutely true or false that the tomato is red.

And here is another scenario involving shape properties:

Abigail the alien and Harry the human view an ordinary compact disc under good light, at a distance of 1 meter. Harry says that the CD is round, while Abigail says that the very same CD is not round (in fact, she says it is triangular). Which of the following do you think best characterizes their views? (Check one and give a brief justification for your answer.)

1. The CD is round, so Harry is right and Abigail is wrong.
2. The CD is not round, so Abigail is right and Harry is wrong.

3. There is no fact of the matter about unqualified claims like ‘the CD is round’.

Different people have different visual experiences when they look at the same object, and it is not absolutely true or false that the CD is round.

Each case stipulated that there was representational variation between the human being and the alien, and also provided the participant with the property ascriptions made by both the human being and the alien (in the color case above, Harry ascribed *red*, while Andrew ascribed *green*; in the shape case above, Harry ascribed *round*, while Abigail ascribed *triangular*). We provided enough description of the conditions in which the ascriptions were made to prevent explanation of the representational difference merely in terms of obviously degraded observation conditions. In each case the object to which the human and aliens ascribed properties was a familiar object whose stereotypical shape/color/etc. should have been known to the participant. In each case, Harry the human was said to have ascribed just this stereotypical shape/color/etc., while the alien was said to have rejected the human’s ascription in favor of a distinct determinate property of the same determinable.³

3.2. Predictions

Recall that the introspective rejoinder to color relationalism claims that the normal phenomenal

³ There is, of course, interpersonal variation in the objects to which delicious is ascribed by normal adult human beings. For scenarios involving delicious, we chose foods that are widely regarded as delicious—chocolate chip cookies and fresh apple pie. However, to control for the fact that some participants might disagree, we added control questions asking, “Do you think chocolate chip cookies are delicious?” and “Do you think fresh apple pie is delicious?”. We excluded the few participants who did not give affirmative answers to these questions.

introspective capacities available to ordinary adults supports the judgment that colors are non-relational. If that is so, and assuming the participants in our population enjoyed those normal introspective capacities (and don't take themselves to be suffering from any kind of cognitive/perceptual illusion that would make the output of their normal introspective capacities unreliable), then these participants should favor either answer (1) or (2). On the other hand, if the normal introspective capacities used by ordinary adults allows that colors might be constituted in terms of a relation to a subject, we would expect these participants to favor answer (3).⁴

Similar predictions apply to non-color domains. That is, to the extent that introspection reveals the non-relationality of a property p , we should expect participants to prefer answers (1) or (2) to cases of representational variation involving p ; and to the extent that introspection allows for the relationality of p , we should expect participants to favor answer (3) to cases of representational variation involving p .⁵

3.3. Results

Looking at mean responses, the participants preferred the relationalist answer (3) 30.9% of the

⁴ It is perhaps worth mentioning here that people are not insensitive to or completely confused by relationalism. As we'll see below, people tend to reject relationalism about shape properties, and people clearly embrace relationalism about the property delicious (see also Nichols and Folds-Bennett 2003).

⁵ On the generalization of this criterion to other domains, see also Sarkissian et al. (forthcoming), who find that subjects are willing to accept both of apparently conflicting ascriptions of moral properties (but not for apparently conflicting descriptive properties), and conclude on this basis that introspection does not rule out relational accounts of moral properties.

time in cases involving shape, 47% of the time in cases involving color, 72.5% of the time in cases involving gustatory properties (sweet, bitter), and 98.5% of the time in cases involving disagreement about *delicious* (see Figure 1).

Figure 1 about here

Using sign tests, we found that participants were more likely to give anti-relationalist answers for color properties than for taste properties ($p < .05$); they were also more likely to give anti-relationalist answers for color properties than for *delicious* ($p < .001$). However, participants were less likely to give anti-relationalist responses for color properties as compared to shape properties ($p < .01$).

Another way to look at the data is to compare across domains the numbers of consistent anti-relationalists - those who give consistently anti-relationalist answers to both cases presented within a domain. For the domain of shape there were 20 (out of 31) consistent anti-relationalists; for the domain of color there were 11 consistent anti-relationalists; for taste there were 7 consistent anti-relationalists; and for *delicious* there were 0 consistent anti-relationalists. Using a McNemar test, we find that participants are more likely to be consistent anti-relationalists about shape than color ($p < .01$), more likely to be consistent anti-relationalists about color than about *delicious* ($p < .01$), but participants are not more likely to be consistent anti-relationalists about color than about taste ($p = .344$, n.s.). (These results are summarized in Figure 2.)

Figure 2 about here

4. Discussion

It appears, then, that philosophers' phenomenally grounded introspective judgments about color - judgments that, we have seen, lead many of them to reject color relationalism - are at odds with

the judgments of a large percentage of the normal adult population.

Now, since (on the understanding of the introspective rejoinder we urged above) the judgments at issue occur at the second stage of a process that begins with phenomenal introspection, it is possible to take the finding that these judgments clash with those made by many normal adult subjects in either of two ways. On the one hand, it could be that the underlying color phenomenology of those who offer the introspective rejoinder is different from the color phenomenology of a large percentage of the normal adult population. That is, this option would account for the observed variance in derived judgments in terms of a difference in the phenomenal/introspective data causally upstream of those judgments. On the other hand, it could be that the philosophers we've quoted enjoy relevantly representative color phenomenology, but that the philosophers somehow end up forming anti-relationalist judgments on the basis of that phenomenology while a large percentage of normal adult subjects do not. Or, in other words, this second option would account for the observed variance in derived judgments in terms of a difference in judgment formation rather than a difference in the phenomenological/introspective source of those judgments.

Needless to say, we would love to be able to choose between these two alternative ways of taking our results. Unfortunately, teasing them apart would require more subtle experimental measures than we know how to formulate. Nonetheless, we believe that our results challenge the introspective rejoinder no matter which of the alternative understandings is correct.

To see why, first suppose the first alternative is correct - that the difference in judgment is the result of a difference in color phenomenology. In this case, then before we regard the introspective rejoinder as a serious threat to color relationalism, we need a reason for thinking that the color phenomenology enjoyed by philosophers and one subset of the normal adult

population is more reliable about the nature of colors than the (we are currently supposing) relevantly different color phenomenology undergone by a different subset of the general population. (Moreover, and obviously, given that the reliability of phenomenology is exactly what is in question, it won't suffice as a such reason simply to appeal to one's phenomenal/introspective judgments.) Suffice to say that we do not see that any such reason has been given.

On the other hand, suppose that the second alternative is correct - that philosophers' phenomenally-informed judgments about whether colors are relational diverge from the those of a large percentage of the normal adult population even though the color phenomenology enjoyed by all of the subjects (philosophers and non-philosophers) is relevantly similar. In this case, before we regard the introspective rejoinder as a serious threat to color relationalism, we need a reason for thinking that the judgments formed by philosophers and one subset of the normal adult population are more reliable than the corresponding judgments formed by another large subset of non-philosophers. It is, we think, possible to imagine an argument for this conclusion - e.g., perhaps someone might want to argue that the judgments of non-philosophers are a mess, and that those of philosophers are more reliable because their training makes the relevant metaphysical alternatives more salient for them (or whatever).⁶ Again, the crucial point is that *an argument of this sort is needed* before the introspective rejoinder can be counted as damaging to color relationalism. (And again, what won't suffice is merely to appeal to the phenomenology,

⁶ In fact, we doubt this specific line of explanation is viable. Recall that, as remarked in note 4, ordinary adults appear to be quite competent in considering and choosing among the relationalist and non-relationalist alternatives in a wide range of cases. Why suppose they take their eyes off the ball just in cases where color is involved?

since - on the current supposition - the phenomenology is shared by those who do and those who don't judge on the strength of that phenomenology that colors could not be relational.) Alas, we don't see that the needed argument has ever been offered in presentations of the introspective rejoinder.

5. *Conclusion*

Our results seem to indicate that the introspective capacities available to our participants, at least, do not clearly reveal color properties to be non-relational in the way and to the extent that they reveal shape properties (canonical non-relational properties) to be non-relational. On the other hand, neither do our data suggest that participants have introspective access to the relationality of color properties that would make them judge these properties to be relational as they do with *delicious*. Rather, the picture that emerges is that, for our participants, colors are somewhere in the middle - more often treated as relational than *delicious* and *sweet*, but less often treated as relational than *square*.

So where does this leave us? It leaves us with the conclusion that the introspective capacities available to normal adults do not, by themselves, supply authoritative and unambiguous data about whether colors are relational. If that is right, then it would seem to follow that no one should rely on such introspective capacities, by themselves, either to argue that colors are relational or that they are not relational.

Of course, that does not mean that the appeal to introspection is completely useless in arguing about the relationality or non-relationality of color. But it puts a burden on those who rely on such appeals to introspection either to show why their introspective capacities are more reliable than those of our (otherwise apparently representative) participants, or to show how

introspection can be combined with other resources in ways that yield more conclusive results.⁷

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⁷ This paper is entirely collaborative; authors are listed in alphabetical order. Thanks to Rick Grush for allowing us to use his students as participants, to the students for putting up with this, and to Paul Pistone for administering the questionnaire. Thanks also to Jonathan Weinberg and Christian Wüthrich for comments. Finally, we thank Joshua Knobe for encouraging us to complete this project, and for extremely useful discussion.

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FIGURES:

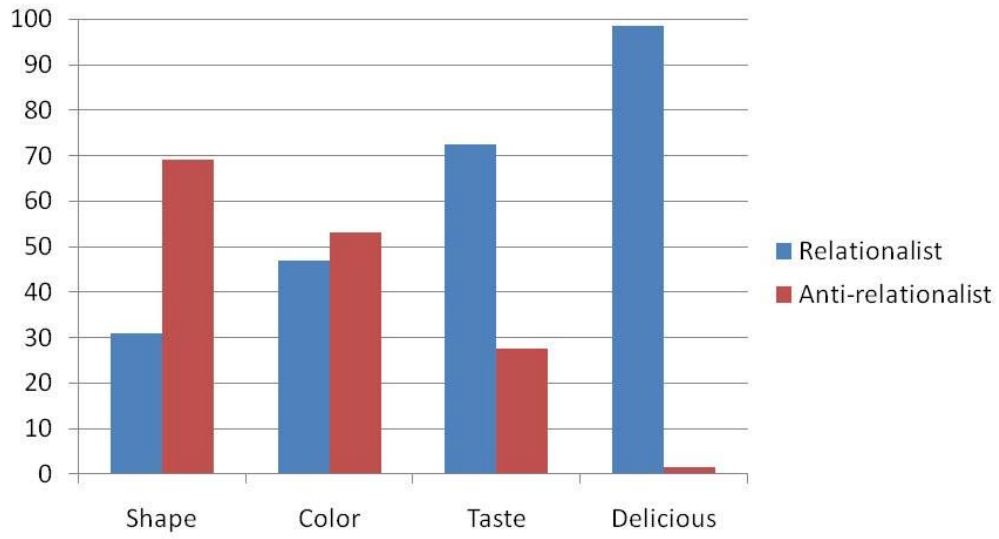


Figure 1: Mean rate of relationalist vs. anti-relationalist responses across domains.

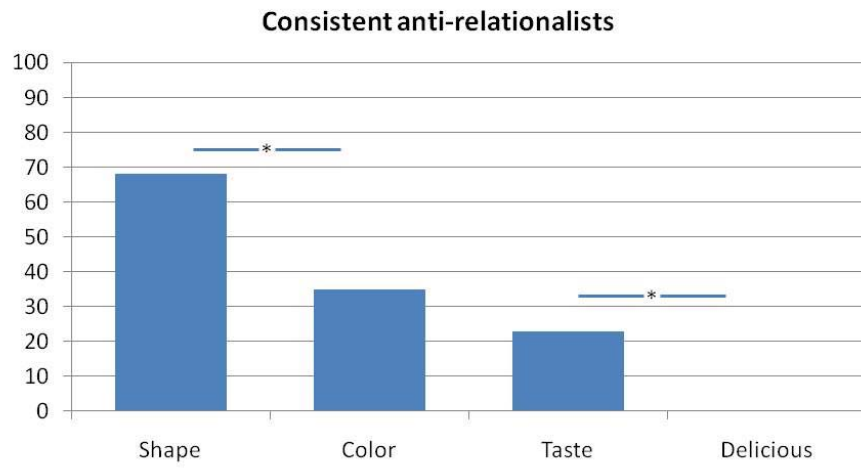


Figure 2: Consistent anti-relationalists by domain.