

Space Perception, Visual Dissonance, and the Fate of Standard Representationalism¹

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This paper argues that a common form of representationalism has trouble accommodating empirical findings about visual space perception. Vision science tells us that the visual system systematically gives rise to different experiences of the same spatial property. This, combined with a naturalistic account of content, suggests that the same spatial property can have different veridical looks. I use this to argue that a common form of representationalism about spatial experience must be rejected. I conclude by considering alternatives to this view.

1.1 Standard Representationalism About Spatial Experience

What constitutes having a perceptual experience has been one of the central concerns of philosophy of mind. A recently popular view is that having perceptual experience is a matter of representing the world around us. One motivation for this view is phenomenological: the phenomenology of perceptual experience is, in part, the phenomenology of being aware of objects and their properties. Being sad, for example, has the phenomenology of being in a state. Hitting a backhand loop has the

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phenomenology of doing something. But seeing an apple has the phenomenology of being aware of an object with a specific color, shape and location.²

The phenomenological motivation is compatible with a variety of non-representationalist outlooks. For example, it might be that perceiving is a matter of standing in a direct non-representational awareness relation with the objects and their properties. However, the possibility of illusions suggests that in perceiving, we are in some sense presented with uninstantiated spatial properties. On the face of it, this suggests that having perceptual experiences is not a matter of standing in a direct awareness relation with ordinary objects and their properties. Barring the option of falling back to sense datum theory, the most attractive option seems to be representationalism.

These considerations do not just motivate the view that having perceptual experience is a matter of representing objects and their properties. They are more specific in at least two respects. First, they suggest that the content of our awareness determines the phenomenology of perceptual experience. It is not just that perceptual experiences have contents. Their contents determine their phenomenal character. It is the redness of the apple and its specific shape that makes it the case that when you are visually aware of these properties your visual experience of the apple has the phenomenal character that it does. Second, these considerations motivate representationalism under a specific construal of representational content. If contents consist in Fregean modes of presentation then it is unclear why being aware of contents would have the phenomenology of being aware of objects and their properties. Phenomenology supports the idea that the phenomenal character of experience is determined by contents under the construal that contents are structures of objects and properties.

This leads to another question: what are the properties that enter the content of experience and what determines which properties do so? Here, a naturalistic account seems to be very attractive partly because it is ontologically conservative. If the properties that we represent and the facts that ground the representation relation are natural then we do not have to expand our ontology in order to account for what constitutes representing. This would enable us to provide a naturalistic account of the phenomenology of spatial experience. And providing a naturalist account of perceptual phenomenology has been one of the most important challenges in recent philosophy of mind.

Lastly, the spatial properties that are represented by experience do not seem to be response-dependent properties that is, they do not seem to be constituted by a relation to brain states or mental items. Part of the reason for this is again phenomenological. Our experience of a round object seems to reveal to us something about the nature of roundness. But it is unclear how representing a property such as “the normal cause of brain state S” can do so. Furthermore, it is unclear what a naturalistic story of our ability to represent such properties might look like. A response-dependent account of the spatial properties that are represented in perceptual experience is thus unappealing.

² Chalmers 2004, 2006, 2012; Dretske 1995; Harman 1990; Horgan and Tiensen 2002; Johnston 2004; Lycan 2001; Pautz 2006; Tye 1995, 2000, 2002.

These considerations together motivate a view that I call Standard Representationalism. The view combines the following four theses:

- Necessarily, if two experiences differ in phenomenology they differ in content. **(Minimal Representationalism)**
- Contents are structures of objects and their represented properties. **(Russellianism)**
- The properties that enter the contents of experience and the factors that determine which properties enter contents are natural. **(Naturalism)**
- The properties that experience represents are response-independent properties. **(Response Independence)**

Standard Representationalism has been endorsed by Dretske 1995, Hill 2009, and Tye 2000. In calling this view “Standard Representationalism,” I do not mean to imply that there is a consensus that this is the only or perhaps the best version of representationalism. Rather, I have chosen this phrase because the view might be the most familiar form of representationalism and perhaps the most common naturalist version of the view.

In saying that the above considerations motivate Standard Representationalism I do not mean that these observations *conclusively establish* the view. Careful philosophical argumentation might lead us to conclude that the phenomenology of perceptual experience does not reveal its nature. Perhaps, as the proponents of state views hold, to perceive is to be in a mental state that is not constituted by a relation to items that we are in some sense aware of.³ Or perhaps, as traditional adverbialists and contemporary enactivist hold, perceiving is a form of acting.⁴ If so, perceiving is not a matter of standing in a relation of awareness to objects and properties. It might also turn out that, as the disjunctivists maintain, perceptions and illusions do not have a common structure. If so, naïve realist views that construe perceiving as standing in a direct relation of awareness to objects might be the correct accounts of perception.⁵ Finally, theoretical pressure might force us to deny naturalism⁶ or embrace a response-dependent account of spatial experience.⁷ Nevertheless, from a dialectical point of view, Standard Representationalism seems to be the most attractive account exactly because it respects the above features of perceptual experience.

Standard Representationalism is a general view about perceptual experience. It is not restricted to a specific perceptual modality or to a specific set of properties. My concern in this paper, however, is with a limited form of the view that restricts it to spatial perception in vision. I call the view Standard Representationalism about Visual Spatial Experience:

³ Block 1996, 2003.

⁴ Chisholm 1975, Sellars 1975, and Kriegel 2007 defend adverbialist views. Noë 2004 defends an enactivist view.

⁵ Campbell 2002, Martin 2002.

⁶ Chalmers 2011, Pautz 2006.

⁷ Kriegel 2002, Shoemaker 2001, 2003.

- Necessarily, if two visual experiences differ in spatial phenomenology they differ in spatial content. (**Minimal Representationalism**)
- Spatial contents are structures of objects and their represented spatial properties. (**Russellianism**)
- The spatial properties that enter the contents of experience and the factors that determine which properties enter contents are natural. (**Naturalism**)
- The spatial properties that experience represents are response-independent properties. (**Response Independence**)

Standard Representationalism about Visual Spatial Experience inherits the merits of Standard Representationalism. Despite its appeal, however, the view is inconsistent with empirical facts about space perception and should be rejected. My main goal in this paper is to defend this claim. The rest of this section explains these empirical facts and introduces the terminology that will be used in the main arguments of the paper. Throughout the paper, I refer to Standard Representationalism about Visual Spatial Experience simply as Standard Representationalism, except for contexts in which the distinction matters.

1.2 Seeming Incompatibility and Veridicality

Much of my discussion and arguments throughout the paper will concern the following example. Make a V sign with your hand, hold it in front of you, and pay attention to the size of the V angle between your index and middle fingers. Now, without changing the size of the angle, tilt your wrist so that rather than facing upward, the V sign is now pointing away from you forming, say, about a 60° angle with the ground. Figure 1 depicts this. Pay attention to the size of the V angle again. It is likely that your experience now seems to present the angle as having a size that is different from the size that your previous experience seemed to present the angle as having. You might disagree with this, but let us put this skepticism aside for the moment. We will come back to it soon.

Let us call the visual experience of the V sign facing upwards E-up and its experience when tilted E-tilt. If it is true that E-up seems to present the angle as having a size that is different from the size that E-tilt seems to present, then we can say that E-up and E-tilt are seemingly incompatible with respect to the size of the angle. More precisely, two experiences of the same object, E₁ and E₂, are seemingly incompatible with respect to a determinable quality, Q, when *in virtue of their phenomenal characters* (a) E₁ seems to present the object as having the property P, (b) E₂ seems to present the object as having the property R, and (c) the subject of experience is disposed to judge that P and R are incompatible values of Q. For example, to say that for me E-up and E-tilt are seemingly incompatible with respect to the size of the angle is to say that, in virtue of their phenomenal characters, it seems to me that E-up presents the angle as having the size P and E-tilt presents it as having the size R and in virtue of having E-up and E-tilt I am disposed to judge that P and R are different sizes. Note that two experiences cannot be

seemingly incompatible without having different phenomenal characters.

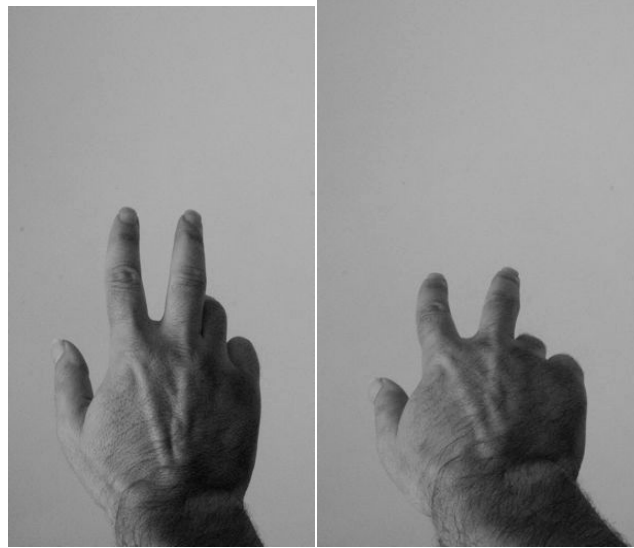


Figure 1 The left picture depicts E-up, the experience of the V sign facing upwards. The right picture depicts E-tilt, the experience of the V sign that is tilted in depth. E-up and E-tilt are seemingly incompatible with respect to the size of the angle of the V.

Let me emphasize that when I say that E-up and E-tilt are seemingly incompatible, I mean that they are incompatible with respect to the *non-perspectival size* of the angle. It is common to distinguish between perspectival and non-perspectival spatial properties of objects. Imagine looking at a tilted coin. The coin is circular. But it is common to assume that the coin has an elliptical perspectival shape, a relational property that it has relative to the point of view of the subject. A natural way to think of perspectival properties is to identify them with the corresponding properties of the projected images of objects on an imaginary plane that goes through the eyes of the observer and is parallel to the frontal plane (the fronto-parallel plane as the psychologist call it).⁸ The tilted coin has an elliptical shape relative to the point of view of the subject because the shape of the image that the coin projects on the fronto-parallel plane is elliptical. The same could be said about the V sign. When the V sign tilts, the size of its projected image on the fronto-parallel plane increases. So its perspectival size increases while its non-perspectival size stays constant. My claim is that E-tilt and E-up are seemingly incompatible with respect to the non-perspectival size of the angle. Of course, if E-up and E-tilt have a perspectival aspect, they

⁸ See Hill 2009 for an alternative way to characterize perspectival properties in terms of visual angles.

differ in that respect too. This is to be expected because the V sign has different perspectival sizes in the two cases. What is surprising is that the two cases differ with respect to their non-perspectival aspect.⁹

In my view, the claim that E-up and E-tilt are seemingly incompatible enjoys weak introspective support. But the argument that I am building up to does not require that seeming incompatibility hold in the V-case; it only requires that seeming incompatibility holds in some cases. And the fact that there are such cases is strongly supported by the empirical science of vision. More specifically, the empirical science of vision supports another claim, Visual Dissonance: the claim that even under ideal conditions our visual system has a systematic tendency to produce seemingly incompatible experiences of some spatial properties.

Why do I say that experiences are “seemingly” incompatible? Let us say that two experiences, E1 and E2, of the same object are incompatible when E1 represents the object as having property P and E2 represents the object as having property Q and E1 and E2 are incompatible values of the same determinable quality. Seeming incompatibility is often indicative of incompatibility. However, under some views, seeming incompatibility and incompatibility might come apart. Those who are familiar with spectrum inversion scenarios are already familiar with this. In a typical version of a spectrum inversion scenario, the same object systematically produces different color experiences in two different subjects when seen in the same illumination conditions. In the same illumination conditions, Jack experiences the color of ripe tomatoes in the same way that Jill experiences the color of cucumbers. Jack and Jill’s experiences of a ripe tomato are seemingly incompatible. However, under some accounts of content Jack and Jill’s experiences attribute the same property to their object. This is of course controversial. But if the claim is correct, then there are seemingly incompatible experiences that are not incompatible.

I call the thesis that there are some seemingly incompatible pairs of experiences whose members are both veridical Veridicality. I shall argue that Standard Representationalism implies Veridicality. So Standard Representationalists are committed to the claim that some cases of seeming incompatibility, for example the V-case, are like the case of spectrum inversion on a standard view. This will be central to my arguments against Standard Representationalism. In §2 and §3 I give two arguments to the effect that Veridicality is incompatible with Standard Representationalism and compare these arguments with some of the existing arguments in the literature. If my arguments are successful, in conjunction with empirical facts about spatial perception, Standard Representationalism is an inconsistent position and should be rejected. I end the paper with a brief discussion of the alternatives to the view, and argue that the challenge generalizes to other views such as naïve realism.

⁹ The issue of whether experiences have perspectival and/or non-perspectival aspects is up for philosophical debate. Among others, Armstrong 1955, Chisholm 1957, Austin 1962, Tye 2000, Noë 2004, and Kelly 2008 have argued that we experience both perspectival and non-perspectival properties. But there are some who disagree. See fn. 14 for references.

1.3 Visual Dissonance and Its Empirical Support

Visual Dissonance is the thesis that, due to the way it is structured and processes information, our visual system has a systematic tendency to produce seemingly incompatible experiences of some spatial properties. The same spatial property can give rise to seemingly incompatible experiences depending on factors such as the orientation of an object, its degree of tilt and its distance from the observer. Since this systematic pattern is grounded in the information processing architecture of the visual system, we expect this pattern to emerge even in ideal conditions. In other words, this tendency reflects the competence of the visual system; it is not a performance effect. The visual system can thus be regarded as an amalgam of multiple systems that kick into operation in different contexts and seem to systematically disagree with each other about the spatial properties of objects.

Let us call seemingly incompatible pairs of experiences that result from the tendency of the visual system to give rise to seemingly incompatible experience dissonant experiences. If Visual Dissonance is true, then there must be numerous examples of dissonant experiences and E-up and E-tilt might be one of these examples. Furthermore, if Visual Dissonance is true, then there might be reasons to regard dissonant experiences as compatible and veridical.

The main evidence for Visual Dissonance comes from the studies of the so-called geometry of visual space that started in mid-nineteenth century.¹⁰ For our purposes here, we do not need to know what psychologists mean by visual space or the claim that it has this or that geometry. For, independent from the claims about the geometry of visual space, the experiments that the psychologists conducted to test the geometry of visual space provide evidence for Visual Dissonance.¹¹

For example, Foley (1972) demonstrated that the perceived size of an angle is a function of its orientation and tilt. Foley asked subjects to construct two overlapping triangles that had a right angle. He presented the subjects with a fixed luminous point, A, and two movable luminous points, B and C, embedded in the horizontal plane on the right and left sides of the visual field (figure 2). The task was to move B to a point where OB seemed equal and perpendicular to BA, and then to move C to a point where OC seemed equal and perpendicular to OB. The physical configuration that subjects created diverged from the way that the subjects must have been perceiving the configuration (Figure 2). The angles ABO and BOC were not right angles and were not equal to each other (neither

¹⁰ Helmholtz 1962/1866 started this line of research. But the main results started coming out in early twentieth century. By mid-twentieth century, the dominant theory was that visual space is not Euclidean. Rather, it is a Riemannian space with a constant negative curvature (Blumenfeld 1913; Luneberg 1947, 1948, 1950.) But classic experiments in the 70's demonstrated that the curvature of visual space is not constant (Foley 1972 Higashiyama 1981, 1984 argued that the curvature of visual space is not constant and varies with distance). Recently, the view that visual space does not have a consistent geometry has become popular (Suppes 1995; MacLeod & Willen 1995; Koenderink 2002, 2008, 2010; Zimmer 1998; and Wagner 1985, 2005.) For a review of this literature see Wagner 2005.

¹¹ For a brief review of some of the key findings in this research see Masrour 2012.

were the lengths of AB and BO).

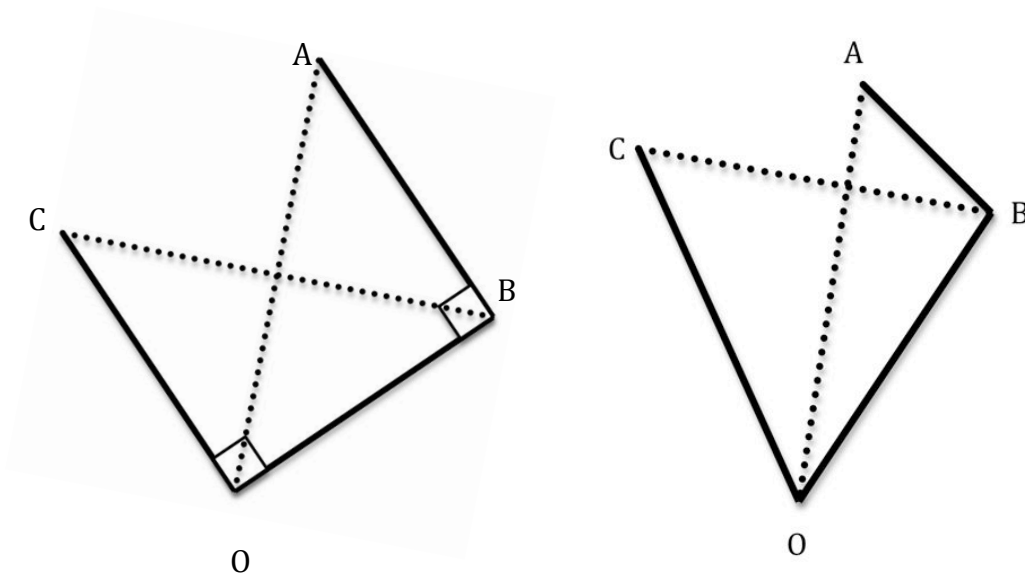


Figure 2. Foley’s experiment. We are looking at the experimental setting from above. Subjects were located at O. The left-hand side depicts the configuration that the subjects were asked to create. The right-hand side depicts the configuration that subjects actually created in physical space. Neither ABO nor BOC were right angles.

Foley’s experiment shows that angles of different size can be perceived equally when they have different orientations. In conjunction with numerous other findings that had emerged prior and afterwards, experiments such as Foley’s support the thesis that perception of spatial properties such as angle size, length, and curvature systematically depend on factors such as orientation and tilt.

It is thus safe to conclude that there is strong psychophysical evidence in support of Visual Dissonance. Still, the psychophysical data falls short of “establishing” the view. In particular, one can think of three venues of resistance. First, Visual Dissonance is a claim about performance in ideal conditions and it is possible to resist the move from data obtained in experimental conditions to conclusions about ideal conditions. In fact, some of the above experiments have been performed in conditions that are detrimental for the performance of the visual system. For example, Foley’s experiments were conducted in conditions wherein there were reduced depth cues. However, several of the experiments that support Visual Dissonance have been conducted in natural conditions that are for no clear reason suboptimal for performance.¹² More importantly, in those cases where the experimental conditions have been detrimental for performance, they have been so in a

¹² See Koenderink (2002, 2008)

way that should equally affect the different systems. For example, reductions in depth cues in Foley's experience should equally affect perception of angles that are facing sideways and those that face the perceiver. So the strategy to resist the idealization involved in Visual Dissonance does not seem to work.

A second strategy is to hold that the data reflects post-experiential matters. For example, one might argue that in having E-up and E-tilt we perceive the non-perspectival size of the tilted and the non-tilted angle similarly, but our access to the way we experience the non-perspectival size of the angle is skewed by differences in degrees of tilt. Generalizing this to the experimental results, one might hold that there is an error in our access and the behavioral pattern that emerges in the experiments is grounded in this error. We can call this the Access Error interpretation.

Although the debate between the Access Error interpretation and the Visual Dissonance interpretation is partly an empirical debate, the empirical literature has not successfully resolved it.¹³ However, theoretical considerations favor the standard interpretation. One should distinguish between the mere possibility of interpreting the data as post-perceptual and the existence of independent evidence or a principled reason for doing so. If the only support for the Access Error interpretation is the fact that it is possible to interpret the data as post-perceptual, then the case for this interpretation is weaker than the case for the standard interpretation. This is partly for the simple reason that this interpretation assumes an error of a specific sort. It is not simply held that access is fallible. For the Access Error interpretation to work, one has to assume that access is biased in a way that explains the data. If there is no independent empirical evidence that suggests the existence of this bias, then a theory that does not posit this error is preferable to one that does. I thus think that although we should take the possibility that the data emerges from access error seriously, in the absence of strong independent reasons to support this interpretation, the standard interpretation is in a better theoretical position.

A third alternative interpretation is to hold that the data is non-phenomenological. For example, one can argue that E-up and E-tilt are not seemingly incompatible because strictly speaking, we do not experience non-perspectival spatial properties and the representations of non-perspectival sizes, whether they are perceptual or not, are not phenomenally conscious. We can call this the Strong Perspectivalist interpretation.¹⁴ On this view, we form beliefs (or dispositions to form beliefs) about non-perspectival sizes and the behavioral pattern that emerges in the experiments is grounded in differences in our beliefs. But strictly speaking, we only experientially represent perspectival properties.

13 In fact, one reaction to the data obtained in the geometry of visual space literature was to interpret the data as post-perceptual (Gogel 1974, Teghstonian 1974, Gogel & Da Silva 1987, and Rock 1983). Those who had obtained the data reacted by defending their findings (Foley 1972, Wagner 1985. See Wagner 2005 for a review of the issue.) But the debate does not seem to have led to a consensus.

14 Hill 2009, ch.5 and Hill 2014, ch.12 seem to adopt a strong perspectivalist position. But this is not completely clear. See §§ 3.2 of this paper for discussion. Prinz 2012, p.74 also seems to advocate the view. The view has also been attributed to Locke 1690/1975, Russell 1914 and Broad 1925. Ayer 1940 and Siewert 2006 seem to hold the view that we only experience non-perspectival properties. Arguably, most sense datum theorists also held the view. See Schwitzgebel 2011, ch.2 for discussion.

However, we should reject Strong Perspectivalism because it has false implications. For example, one implication of the view is that the visual experience of a tilted coin is identical with the experience of a non-tilted ellipse with respect to shape. If so, copying the perspectival shape of a tilted coin under the guidance of perceptual experience should be as easy (or as hard) as copying the shape of a non-tilted ellipse. But this is false. It is harder to draw the perspectival shape of a tilted coin than to draw the perspectival shape of a non-tilted ellipse. The fact that it is comparatively much harder for us to draw in perspective than to draw objects that face us head on is testimony to this. This is why it took us a very long time to invent perspective in paintings. As Figure 3 illustrates, the invention of perspectival painting involved inventing means to aid us overcome the difficulty of seeing the perspectival shapes of objects. This is very hard to explain under Strong Perspectivalism.¹⁵



Figure 3. Albrecht Dürer, *Man Drawing a Woman*. Albert Dürer documented various methods that aided painters to *see* perspectival properties. The fact that we need these aids not only conflicts with Strong Perspectivalism, but also with the idea that we experience perspectival properties.

I conclude that Strong Perspectivalism should be rejected because of its implausible implications. As Schwitzgebel (2011) has also argued, the view is grounded in over-

¹⁵ One might object to the above argument by pointing that the experience of the shape of a tilted coin and the experience of the shape of a non-tilted ellipse are not strictly speaking identical. One is experienced as elliptical *from here* and one is experienced as simply elliptical. However, it is unclear whether this reply is available to the strong perspectivalist. For on this view, all experienced spatial properties are perspectival. Thus the strong perspectivalist has to hold that the tilted coin and the non-tilted ellipse are both experienced as elliptical from here. In the case of the tilted coin, we form the belief that although the coin looks elliptical from here, it is not elliptical. And in the case of the non-tilted ellipse we form the belief that it looks elliptical from here and is elliptical. So under strong perspectivalism there is no disanalogy between the tilted coin and the non-tilted ellipse.

analogizing visual experience to painting or photography.¹⁶ We can therefore set the Strong Perspectivalist interpretation aside. I thus think it is safe to conclude that there is strong empirical support for Visual Dissonance.

Let us take stock. I started this section by explaining a view that combines a Russellian form of representationalism about spatial experience with a naturalistic account of representational content and the view that the spatial properties that are represented by perceptual experience are response-independent. I called this view Standard Representationalism and argued that it is attractive in many respects. Despite its attraction however, I will argue that Standard Representationalism is incompatible with Visual Dissonance according to which, due to the way it is structured and processes information, the human visual system has a systematic tendency to produce seemingly incompatible experiences of some spatial properties. I illustrated the empirical support for Visual Dissonance, discussed a few challenges, and argued that the challenges can be addressed. I also introduced some of the key terms that will be used in the rest of the paper (seeming incompatibility, incompatibility, dissonant experiences, and Veridicality).

Throughout the paper, I shall assume that E-up and E-tilt are seemingly incompatible and are dissonant experiences. The claim that they are seemingly incompatible enjoys weak support from introspection. However, I do not know of any experiments that have tested the claim. But as emphasized earlier, this does not matter for our purposes because the role of E-up and E-tilt is just to help illustrate the argument that if there are seemingly incompatible experiences that are veridical Standard Representationalism has to be rejected. Since Visual Dissonance is true, there are such experiences. Thus, it does not matter if E-up and E-tilt are not seemingly incompatible.

2. The Argument From Actual Variation

The goal of this paper is to argue that Visual Dissonance poses a serious challenge for Standard Representationalism. This is because dissonant experiences combine two features: they are seemingly incompatible, but the Standard Representationalist has to regard them as veridical. In this respect, dissonant experiences are similar to cases of spectrum inversion.

An important move in my argument is that, as naturalists, Standard Representationalist have to accept Veridicality: the thesis that some seemingly incompatible experiences are veridical. The idea that a naturalistic account of content implies Veridicality is rather obvious under the simple account that a representational type represents the property that it causally covaries with in ideal conditions. Suppose that in ideal conditions 42° angles have been observed to give rise to type A experiences when tilted and type B experiences when facing upwards. Suppose also that type A experiences and type B experiences are seemingly incompatible. Still, since they track the same property in ideal conditions they are both veridical experiences of 42° angles. To generalize, dissonant pairs of experiences are both veridical in ideal conditions. Since some seemingly

¹⁶ Schwitzgebel Ibid. also raises an interesting objection to the possibility of defining perspectival properties.

incompatible experiences are dissonant experiences, it follows that some seemingly incompatible are veridical.

The same, I believe, holds for more sophisticated naturalistic accounts of content. But this is less obvious and requires some careful argumentation. But in order to facilitate the flow of the paper, I present these arguments in an appendix section at the end of the paper. In what follows I will assume that the Standard Representationalist is committed to the view that causal covariance in ideal conditions fixes representational content and is thus committed to Veridicality. Those readers who are interested in why more sophisticated naturalistic accounts have the same commitment can refer to the appendix.

My goal in this and the next section is to argue that Veridicality is incompatible with Standard Representationalism. The exact shape of the argument, however, depends on one's views about how to count experiences. This is a subject of controversy. On one end of the spectrum, there are holists such as Tye (2003), who hold that at each moment a conscious subject has only one single encompassing experience. On the opposite end, there are atomistic views such as Bayne (2010) who argue that at each moment each subject has as many experiences as there are phenomenal properties instantiated in her. The fact that dissonance poses a threat for Standard Representationalism does not depend on which party in the debate between the holist and the atomist is correct. But the shape of the threat depends on where we stand on this issue. In this section, I give an argument assuming an atomistic view. In the next section, I give an argument that does not assume atomism. As we shall see, the arguments are also different in other important respects.

2.1 Argument From Actual Variation

If we assume atomism, then it seems plausible that E-up and E-tilt have experiential components that represent the non-perspectival size of the angle and nothing else. Let us call these components E-up_{np} and E-tilt_{np}. The goal of the first argument is to prove that, given the other theses of Standard Representationalism, E-up_{np} and E-tilt_{np} are counterexamples to Minimal Representationalism: the thesis that experiences with the same spatial content have the same spatial phenomenal character. The argument has two parts. The first part establishes that E-up_{np} and E-tilt_{np} have different phenomenal characters. This seems reasonable if we assume that E-up and E-tilt are seemingly incompatible. The second part establishes that Standard Representationalists are committed to the thesis that E-up_{np} and E-tilt_{np} have the same content. This partly relies on the idea that any naturalist has to hold that E-up_{np} and E-tilt_{np} are both veridical. Since E-up_{np} and E-tilt_{np} are both veridical, we can, with the aid of the other theses of Standard Representationalism, prove that they attribute the same non-perspectival size to the angle. This, in turn, implies that E-up_{np} and E-tilt_{np} have the same contents. The two parts together imply that E-up_{np} and E-tilt_{np} have the same content but differ in phenomenal character. This clashes with Minimal Representationalism. This is the basic idea behind the argument. But, as it is often said, the devil is in the details. So, let us see the argument in more detail.

- 1- E-up and E-tilt are seemingly incompatible with respect to the non-perspectival size of the angle. (**Seeming Incompatibility**)

- 2- E-up and E-tilt each have a component that presents the non-perspectival size of the V sign and nothing else. (Let us call these components E-up_{np} and E-tilt_{np} respectively.)
- 3- E-up_{np} and E-tilt_{np} have different phenomenal characters. (**Phenomenal Difference**)
- 4- If naturalism then E-up and E-tilt are both veridical. (**from Veridicality**)
- 5- If naturalism then E-up_{np} and E-tilt_{np} are both veridical. (from 4)
- 6- If response-independence then veridical experiences of the same determinable feature of an object attribute the same property to their object. (**Attribution Identity**)
- 7- If Russellianism, then two experiences that attribute the same property to their object have the same representational content. (**Content Identity**)
- 8- Therefore, if naturalism, response-independence and Russellianism, then E-up_{np} and E-tilt_{np} have the same representational content.
- 9- Therefore, if naturalism, response-independence and Russellianism, E-up_{np} and E-tilt_{np} have the same representational content but differ in phenomenal character.
- 10- Therefore, if naturalism, response-independence and Russellianism, Minimal Representationalism about spatial experience is false.

The main premise of the first part is that E-up and E-tilt are seemingly incompatible with respect to the non-perspectival size of the angle. We are entitled to this premise by assumption. This is because there is empirical support for Visual Dissonance and if so there are pairs of dissonant experiences. We are simply assuming that E-up and E-tilt are such a pair and since dissonant experiences are seemingly incompatible it follows that E-up and E-tilt are seemingly incompatible. If it turns out that E-up and E-tilt are not seemingly incompatible, then we have to change our example. But the generic structure of the argument will not change.

According to the second premise, E-up and E-tilt have components that represent the non-perspectival size of the V sign. If one assumes the atomistic view that the experience of the angle is a complex experience that has parts which are themselves experiences, then one natural way to individuate these parts is in terms of the contents of the experience. Accordingly, since E-up and E-tilt represent the non-perspectival size of the angle then they must have experiential part that represents the non-perspectival size of the angle and nothing else. Of course, the idea that experiences have parts that are themselves experiences is controversial. But again, we are working under the assumption that atomism is true. So the second premise, strictly speaking, has a conditional form: if atomism then E-up and E-tilt each have a component that presents the non-perspectival size of the V sign and nothing else. In the next section, I give an argument that does not presuppose atomism.

If we accept that E-up_{np} and E-tilt_{np} are the components of E-up and E-tilt that are responsible for presenting the non-perspectival size of the angle, then it is natural to assume that E-up_{np} and E-tilt_{np} are responsible for the non-perspectival size phenomenology of E-up and E-tilt. And since E-up and E-tilt differ with respect to their non-perspectival size phenomenology then it is plausible to conclude that E-up_{np} and E-

tilt_{np} differ in phenomenal character. In short, atomism and Seeming Incompatibility together imply Phenomenal Difference, which is the conclusion of the first part.

Premises four through nine comprise the second part of the argument, which establishes that E-up_{np} and $\text{E-tilt}_{\text{np}}$ have the same contents. That is, they attribute the same non-perspectival size property to the angle. The main premise of this part is that if naturalism then E-up and E-tilt are both veridical. This follows from Veridicality and the assumption that E-up and E-tilt are examples of dissonance. The fifth premise extends the veridicality of E-up and E-tilt to E-up_{np} and $\text{E-tilt}_{\text{np}}$. This should be uncontroversial. It would be implausible if E-up and E-tilt were veridical but had non-veridical components.

Intuitively, veridical experiences of the same determinable feature attribute the same property to their object. For example, if we both veridically experience the color of an object, then our experiences must be attributing the same color property to it. But on some views, an object can have multiple determinate versions of the same determinable quality. For example, on a response-dependent view, the same object can be green relative to me and red relative to my invert. On a view like this, my experience and my invert's experience can be both veridical while attributing different colors, or color-like qualities, to the object. But, it seems that at least those who adopt response-independence have to accept that veridical experiences of the same determinable spatial feature of an object attribute the same spatial property to their object. This is what Attribution Identity asserts. This said, there might be two additional ways to deny Attribution Identity, which involve appealing to indeterminate contents or multiple appearance views. In §§ 3.2 I show that these replies do not work in the case of seemingly incompatible experiences.

Finally, Content Identity states that if Russellianism then two experiences that attribute the same property to their object have the same representational content. Fregeans can deny that experiences that attribute the same property to their object have the same contents. For, two experiences can attribute the same property to their object but have different modes of presentation and Fregeans identify contents with modes of presentations. However, Russellians who identify contents with structures of objects and the properties that are attributed to them have to accept Content Identity.

Premises four through nine together imply that if naturalism, response-independence and Russellianism then E-up_{np} and $\text{E-tilt}_{\text{np}}$ have the same representational content. This, combined with the third premise implies that if naturalism, response-independence and Russellianism then E-up_{np} and $\text{E-tilt}_{\text{np}}$ have the same representational content but differ in phenomenal character. Thus, Minimal Representationalism is false. So Standard Representationalism is inconsistent.

2.2 Objections and Replies

The most promising strategy for resisting the argument involve denying Attribution Identity according to which, if response-independence two veridical representations of the same determinable quality attribute the same property to their object. It is possible to deny this premise by appealing to indeterminate contents or to a view that I here call the

“multiple appearance view”. But in what follows, I argue that neither of these strategies succeed.

Suppose that I tell you that the color of Jack’s shirt is either blue or white, and Jack tells you that the color of his shirt is either blue or red. As it turns out, the shirt is blue and we are both right. But, in a sense, we did not attribute the same property to the shirt. If experiences sometimes attribute indeterminate properties then it is possible to generalize this to the case of experiences. For example, suppose that the contents of $E\text{-up}_{np}$ and $E\text{-tilt}_{np}$ are $[39^\circ\text{-}43^\circ]$ and $[41^\circ\text{-}45^\circ]$ respectively. Here a $[x^\circ\text{-}y^\circ]$ content is a content that attributes the property of having a size between x° and y° to its object. Suppose also that the angle that gives rise to $E\text{-up}_{np}$ and $E\text{-tilt}_{np}$ is a 41° angle. If so, $E\text{-up}_{np}$ and $E\text{-tilt}_{np}$ are both veridical, but they do not have the same content, which implies that Attribution Identity is false.

However, the appeal to indeterminacy cannot help the Standard Representationalist. Let us distinguish between two ideas that underlie the indeterminacy reply. One is the idea that rather than representing precise values, $E\text{-up}_{np}$ and $E\text{-tilt}_{np}$ represent angles as falling within indeterminacy windows.

The other idea is that there is overlap between the indeterminacy windows of the contents of $E\text{-up}_{np}$ and $E\text{-tilt}_{np}$. The indeterminacy reply will not work unless we accept overlap. But if we accept Standard Representationalism then it is hard to see how overlapping experiences might seem incompatible. Note that overlapping contents attribute different *but compatible* properties to their object. If I tell you that Jack’s shirt is either blue or white, and Jack tells you that the color of his shirt is either blue or red, then Jack and I have said different things, but we have not said incompatible things. So, barring a mistake on your side, it should not seem to you that what Jack says is incompatible with what I said. Similarly, the property of having a size between $[39^\circ\text{-}43^\circ]$ and a size between $[41^\circ\text{-}45^\circ]$ are not incompatible properties. And under Standard Representationalism spatial phenomenology is determined by spatial content. Therefore, if Standard Representationalism were true one would expect compatible contents to seem compatible to the subject. We can therefore conclude that the indeterminacy view cannot help the Standard Representationalist with these cases.

A second objection to Attribution Identity appeals to the multiple appearance view. According to this view, the same physical property, for example the color or the shape of an object, has multiple appearance properties (or qualitative natures) that are instantiated by the object at the same time. In different contexts, and due to differences in brain processing, an observer’s experience can select different appearance properties associated with the same physical property. If this picture is correct, then the appearance that one’s experience selects can change in different contexts of observation or due to differences in neural processing. Thus, in principle, one who adopts a multiple appearance view can reject Attribution Identity. For example, if an object has multiple color appearances, then

different veridical experiences of the same object might be attributing different color-like properties to it.¹⁷

Can we extend the multiple property view to spatial properties? A simple option is to identify spatial appearances with perspectival properties. On a view like this, a circular coin instantiates many different appearance properties relative to possible planes where an imaginary observer's eyes are located. This might be an interesting view, but is orthogonal our argument which is about non-perspectival properties.

Hill (2009) defends what seems to be a non-perspectivalist account of spatial appearances that identifies them with the spatial properties that an object has relative to a context of observation and a constancy transformation function that is used to process non-perspectival properties.¹⁸ Hill calls these properties Thouless properties. He does not explicitly endorse the view that an object has multiple Thouless properties at each moment. But there is no reason to assume that he cannot do so. In fact, if Visual Dissonance is correct and non-perspectival sizes are computed by constancy transformations, there must be multiple constancy transformations associated with a single non-perspectival property and thus multiple Thouless properties associated with it. Hill might thus argue that $E\text{-up}_{np}$ and $E\text{-tilt}_{np}$ attribute two different Thouless non-perspectival size properties to the angle. And since the angle instantiates both of these properties (and many more) both experiences are veridical. So it might seem that the appeal to Thouless properties can help block Attribution Identity.

However, there is an important reason to think that the appeal to Thouless properties (or any other version of the multiple appearance view) fails because the multiple appearance view conflicts with seeming incompatibility at least if we adopt representationalism. On the representationalist view, the phenomenal character of spatial experience is determined by the nature of the properties that enter the content of experience. So it is natural to assume that the representationalist is committed to the principle that experiences cannot be seemingly incompatible unless their contents are incompatible. But the different Thouless properties are compatible with each other since they can be instantiated by the same object at the same time. So if two experiences attribute two compatible Thouless properties, then it is unclear why they should seem incompatible. Thus the multiple appearance view is in conflict with seeming incompatibility.¹⁹

¹⁷ Hilbert 2005, Kalderon and Hilbert 2000, and Kalderon 2011 defend a multiple appearance view of colors and have used it to resist arguments of that are somewhat similar to my arguments. These authors aptly distinguish between cases where a property is mind-dependent and those in which (a) the selection of the property for representation (experience) is partially mind-dependent and (b) the property is characterized in relation to a *possible (but necessarily instantiated)* property of a subject. A property is mind-dependent when its instantiation by an object requires the instantiation of a property by a subject. So appearance properties are mind-independent in that they are instantiated by objects even when the subjective properties relative to which they are characterized are not instantiated and the fact that they are selected for experience by factors internal to subjects does not conflict with this.

¹⁸ Hill Ibid. pp.161-168

¹⁹ In this respect, the phenomenon of seeming incompatibility is different from the ordinary phenomenon of constancy. In the ordinary phenomenon of constancy, although the appearance of an object with respect to a determinable quality changes, one does not seem to experience the object as changing with respect to the quality. For example, when the apparent color of your desk changes as the ambient light changes, you do

The multiple appearance view thus fails for the same reasons that the appeal to indeterminate contents fails. Both replies are committed to the compatibility of the contents of $E\text{-up}_{np}$ and $E\text{-tilt}_{np}$ and this, under representationalism conflicts with the seeming incompatibility of $E\text{-up}_{np}$ and $E\text{-tilt}_{np}$. Thus, the phenomenon of seeming incompatibility is not any ordinary difference in phenomenal character. It is a difference of a specific sort that makes our argument immune to these replies. I conclude that we can safely put aside the appeals to indeterminate contents and the multiple appearance views.

2.3 Comparison to Other Arguments

Counterexamples to Standard Representationalism that are based on spatial experiences are not a rare sight in recent philosophy of mind. But there is an important difference between my argument and the existing ones. For example, Peacocke (1997) presents a case where one sees two trees that have the same size but are located in different distances from the observer. Peacocke argues that this is a counterexample to representationalism because the experience of the tree that is closer and the experience of the tree that is farther away have the same size-relative contents but differ with respect to their phenomenal characters. Peacocke's counterexample is different from mine in a crucial respect. The natural way to think about the trees is that the two experiences are not seemingly incompatible with respect to the non-perspectival size of the tree. But $E\text{-up}$ and $E\text{-tilt}$ are seemingly incompatible with respect to the non-perspectival size of the angle.

The above difference is important in that it makes my argument immune to a quick reply to the tree scenario and other similar examples. The reply takes the form of a dilemma. Either we accept atomism or we do not. If we accept atomism the non-perspectival components that attribute the same size to the trees have the same phenomenal character and the perspectival components that attribute different perspectival sizes have different phenomenal characters. Thus the two experiences do not have any components that are similar in content but differ in phenomenal character. On the other hand, if we adopt holism then the experiences of the trees differ both in content and in phenomenal character. So we do not have a counterexample to representationalism. My argument is immune to the horn of the reply that assumes atomism. Obviously, one can block my argument by adopting holism. But in the next section, I give an argument that is immune to this reply.

A second class of spatial counterexamples to Standard Representationalism rely on the possibility of certain scenarios in which a spatial property gives rise to experiences that differ in phenomenal character from the experiences that this property gives rise to in our world.²⁰ These would be cases of cross-world phenomenal variation but sameness of content. These arguments move from the conceivability of these scenarios to their

not experience the desk as changing color (this is why the phenomenon is called constancy). But in the case of seeming incompatibility, the difference in the way the size of an angle seems is accompanied by an experience of incompatibility.

²⁰ See Chalmers 2006, 2012 and Thompson 2003.

possibility and are vulnerable to the denial of this move. However, my argument is based on an actual case. Visual Dissonance is not a hypothesis about a possible world. It is true in our actual world. Therefore, my argument cannot be blocked by denying the link between conceivability and possibility.

In focusing on actual cases, my argument is similar to Block's cases against representationalism who argues that actual cases of phenomenal difference without representational difference exist in the cases of color experiences and attentional influence on contrast perception.²¹ But there is an important difference. As we saw earlier, my argument is immune to multiple appearance replies. However, the appeal to the multiple appearance view has been a common strategy to resist Block-style arguments.²²

This ends my argument from actual variation against Standard Representationalism. I have argued that given Visual Dissonance, there are actual counterexamples to Standard Representationalism. My argument is preferable to some of the existing anti-representationalist arguments in important respects. But the argument assumes an atomistic view and can be blocked by denying atomism. The next section gives an argument that does not rely on atomism.

3. The Argument From Hypothetical Variation

The fact that Visual Dissonance threatens Standard Representationalism seems to be independent of matters pertaining to how we count experiences. If this is correct, we should be able to give an argument that does not rely on atomism. My aim in this section is to do so. Since this argument is based on a hypothetical scenario, I call it the argument from hypothetical variation.

3.1 The Argument From Hypothetical Variation.

Visual Dissonance is a contingent empirical fact that results from the details of the neural processing involved in representing spatial properties. At the moment, we may not know the facts at the neural level that give rise to the multiplicity of strategies for processing angle sizes. Still, we can stipulate that there can be a species whose normal members are similar to us in every respect except for the fact they do not suffer from Visual Dissonance in that they only rely on one system for processing angle sizes. Let us thus imagine Sam and Pam. Like us, Sam suffers from visual dissonance, but Pam does not. Pam is a normal member of the non-dissonant species. Let $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ stand for the experiences that Sam and Pam have when they look at the tilted V sign. We can argue against Standard Representationalism by showing that $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ differ in phenomenal character but have the same contents.

When Sam and Pam look at a non-tilted angle in normal conditions, the same neural mechanism gets activated in them and gives rise to similar experiences of the size of the

²¹ Block 1996, 1997, 2003, 2007, 2010.

²² See Kalderon 2011.

angle. But things change when they look at the same angle when it is tilted. Sam suffers from visual dissonance. Thus a new neural mechanism kicks in and gives rise to an experience of the non-perspectival size of the angle that is seemingly incompatible with his experience of the non-tilted angle. Pam, on the other hand, does not suffer from visual dissonance. So, in her, the same neural system that processes the non-tilted angle operates for processing the tilted ones. Assuming that everything is functioning normally, her experience of the non-perspectival size of the tilted angle will be identical with her (and Sam's) experience of the non-perspectival size of the non-tilted angle). Thus Pam's experience of the tilted angle has a different phenomenal character from Sam's experience of the tilted angle. Starting from this, the argument goes as follows:

- 1- $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ have different phenomenal characters.
- 2- $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ are experiences of the same cluster of determinable features.
- 3- If naturalism, $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ are both veridical. (**from Veridicality**)
- 4- If response-independence then veridical experiences of the same determinable feature attribute the same property to it. (**Attribution Identity**)
- 5- Therefore, if naturalism and response-independence then $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ attribute the same properties to their object.
- 6- If Russellianism, then two experiences that attribute the same properties to their object have the same representational content. (**Content Identity**)
- 7- Therefore, if naturalism, response-independence and Russellianism, then $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ have the same representational content.
- 8- Therefore, if naturalism, response-independence and Russellianism, $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ have the same representational content but differ in phenomenal character.
- 9- Therefore, Minimal Representationalism is false.

The argument is similar to the argument from actual variation. We need to establish that $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ differ in phenomenal characters but share their contents. The claim that $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ have different phenomenal character follows from our stipulation that Pam does not suffer from dissonance. The argument for the claim that $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ have the same contents is, for the most part, identical to the previous argument except for one difference: the new argument does not rely on the idea that $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ have a separable experiential component that represents the non-perspectival size of the angle. We can thus allow that $E\text{-tilt}_{\text{Sam}}$ and $E\text{-tilt}_{\text{Pam}}$ are simple experiences. This will remove the reliance on atomism. The rest of the argument proceeds in the same way as the previous argument and the defense of the premises carries over.

3.2 Comparison to Other Arguments

One can roughly divide the recent anti-representationalist arguments into two groups. Some like Block and Pautz conclude from some empirical facts about us that there actually are, or can be, counterexamples to Standard Representationalism.²³ The second strategy employed by Chalmers and Thompson relies on a priori conceivability claims to

²³ Block Ibid., Pautz Ibid.

argue that counterexamples to minimal representationalism are conceivable and thus possible.²⁴

In relying on Visual Dissonance, both of my arguments fall in the Block-Pautz category of arguments. I remarked in the previous section that the argument from actual variation is similar to Block's strategy but is immune to the multiple appearance reply. My second argument is based on a hypothetical scenario and in this respect is similar to Pautz (2006) who also moves from actual facts about our visual system to hypothetical situations. Pautz argues that in these hypothetical situations the intuitive verdict is that there are differences in phenomenal character but the Standard Representationist is committed to sameness of phenomenal character.

Pautz's hypothetical situations are similar to my cases of dissonance. We agree that in these cases the Standard Representationist is committed to the sameness of experience because she is committed to sameness of content. However, Pautz argues for sameness of content directly, while I argue for it indirectly by defending veridicality and concluding sameness of content from it. So Pautz's argument is less committal than mine and in this respect is preferable to it.²⁵ But my arguments concern primary quality perception, while Pautz's arguments focus on secondary quality perception. It is often thought that Standard Representationalism is on stronger footing when it comes to primary quality perception than when it comes to secondary quality perception. Moreover, primary quality perception is often thought to afford an argument *for* Standard Representationalism over rival views.²⁶ So my argument targets Standard Representationalism where it seems to be the strongest.

My argument from hypothetical variation does not rely on an actual case. This argument is about a possible scenario. But unlike the arguments of Chalmers and Thomson, it is not a conceivability argument. Conceivability arguments rely on the principle that conceivable scenarios are possible. My argument, in contrast, moves from the actuality of Visual Dissonance to the possibility of its absence. Here, our justification for believing in the possibility of the absence of Visual Dissonance relies on our understanding of the brain mechanisms that underlie Visual Dissonance and whose change can turn a creature that suffers from Visual Dissonance to one that does not. So, we do not have to argue that since absence of Dissonance is conceivable, it is possible.

This ends my argument against Standard Representationalism. Assuming that naturalists are committed to the veridicality of dissonant experiences, I have given two arguments against the view. The argument from actual variation showed that E-tilt and E-up have components with identical representational contents that differ in phenomenal characters. The argument from hypothetical variation showed that we can find other

²⁴ Chalmers *Ibid.*, Thomson *Ibid.*

²⁵ However, I suspect that the indeterminacy and the multiple property views might be able to resist Pautz's argument for sameness of content. Defending this claim, of course, goes beyond the scope of this paper.

²⁶ See for example the new many property problem in Tye (2009) where he argues that spatial perception plus the falsity of sense datum theories recommends intentionalism about spatial perception and a response-independent externalist version represents the only way to develop intentionalism about spatial perception in a naturalistic fashion. I am indebted to Adam Pautz for bringing this to my attention.

counterexamples to Standard Representationalism by comparing the experiences of subjects who suffer from dissonance to those who do not. We thus have strong reasons to conclude that Visual Dissonance poses a serious challenge for Standard Representationalism.

Conclusion

The psychology of space perception supports Visual Dissonance, the thesis that the visual system systematically gives rise to dissonant experiences and can be regarded as an amalgam of relatively dissociated sub-systems. In this paper, I have used Visual Dissonance to show that Standard Representationalism has counterexamples. We can conclude that view is an unstable position and has to be abandoned.

Rejecting Standard Representationalism raises the question as to what should replace the view. My argument has been to show that given Visual Dissonance, the four theses of Standard Representationalism (Minimal Representationalism, Naturalism, Russellianism and Objectivism) are inconsistent with each other. So one way to answer our question is to determine which one of the theses of the view has to be rejected.

One option is to deny naturalism (Chalmers 2006, Chalmers 2011, Pautz 2006). The common strategy here has been to adopt the Edenic content view. A second option is to deny Russellianism in favor of a Fregean representationalist view (Thompson 2003). A third option is to deny Objectivism in favor of a response-dependent view Kriegel (2002, 2008) and Shoemaker (2003).

This paper is not the place to do justice to these views. But let me quickly mention why I do not find them initially appealing. First, as admitted by some Fregeans there are reasons to assume that a Fregean account is not adequate to the task.²⁷ Second, although the Edenic and the response-dependent options seem to be a good fit for color experiences and other secondary qualities, it is not clear how these views can be extended to spatial properties.²⁸ The response-dependent view is also unattractive for reasons that we saw earlier.

Since these seem to be the best representationalist options, then it is tempting to reject representationalism in general. Setting aside representationalism, leaves us with a few other choices. One is to adopt a naïve realist account. Arguably, such a strategy would work only if the naïve realist can give us a reason to deny Veridicality. This is because naïve realism seems to be also committed to a thesis similar to Minimal Representationalism, namely that veridical experiences of the same property share their phenomenal character. Thus, if a naïve realist cannot deny Veridicality then the view is threatened by the same arguments that target Standard Representationalism. On the other hand, it is unclear how proponents of naïve realism can deny Veridicality without abandoning naturalism. And if we are saving the view by abandoning naturalism, then

²⁷ See Chalmers (2006) as an example.

²⁸ See Peacocke (2013) and Siegel (2013) on this issue.

naïve realism does not have a comparative advantage to non-naturalist representationalism with respect to my argument.

What choice is there if we reject both representationalism and naïve realism? One possible view is to hold that there are aspects of spatial experience that are non-representational. This does not have to take the form of sense datum theory or a commitment to qualia. One area that is worth exploring is the Kantian insight that the spatial and temporal aspects of experience are its formal elements in the sense that they are the condition of possibility of experience. I take this to imply that we do not strictly speaking represent space and time. We need them as frameworks in order to represent other properties. I hope to explore this option in the near future.

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Appendix. Naturalism and Veridicality

In the first section of the paper I argued that vision science supports Visual Dissonance. If Visual Dissonance is correct then the visual system has a systematic tendency to give rise to seemingly incompatible experiences of the same spatial property in ideal conditions. I also argued that given Visual Dissonance those who adopt the view that causal covariance in ideal conditions determines content are committed to Veridicality: the thesis that some seemingly incompatible pairs of visual experiences are veridical. However, this simple view is not the only possible naturalistic theory of content. Nevertheless, I argue in this Appendix that more sophisticated naturalistic accounts of perceptual content have a similar commitment. As before, I shall use E-tilt and E-up as the central examples, assuming that they both causally covary with 42° angles in ideal conditions. I also assume that E-tilt and E-up are produced by different systems, one that operates over tilted angles and one that operates over angles that are not tilted. I call these systems the Tilt and the Up systems respectively. The empirical data suggests that there are many more systems. But to simplify the discussion, I assume that the Up and the Tilt systems exhaust visual space perception. To simplify the discussion, I shall also assume that the naturalist's choice for the system that correctly represents spatial properties is the Up system. Our guiding question is: which naturalist account of content has the implication that the content of E-tilt diverges from what it causally co-varies in ideal conditions in a manner that might imply its non-veridicality? I consider three general strategies: appeals to teleological factors, consumption patterns and the distinction between basic and non-basic representational types. I will argue that none of these strategies succeed. It is worth emphasizing that my aim here is not to show that the naturalist cannot possibly deny Veridicality. The aim is to show that a naturalist cannot justifiably do so.

A rather common strategy among contemporary naturalists is to appeal to teleological factors. Teleological theories come in a variety of forms, but the gist of these views is that natural functions determine representational contents.²⁹ Appeals to natural function can help the theorist narrow down the features that causally covary with a state type to those that match our intuitions about content. To use a common example, suppose we find out that a population of neurons in frog brains gets activated upon seeing flies. This

²⁹ See Dretske 1995 and Millikan 1984.

population not only causally covaries with the presence of flies, but also with the pattern of the retinal activation produced by the presence of flies. However, we do not want to say that the activation of this neuronal population represents retinal activity. The appeal to teleological factors can give us independent reasons to assume that the natural function of this population is to detect the presence of flies. Intuitively, detecting flies is more important for the frog's fitness than detecting the activity patterns on the retina. Therefore, although the neuronal population causally covaries with proximal facts like the activation of the retina, its natural function is to detect the presence of flies. A teleologist can thus justifiably hold that retinal activation does not belong to the content of the neuronal population.

In a similar fashion, the teleologist might propose that the natural function of E-tilts is to detect a property different from 42° . If so, undergoing an E-tilt experience in response to a 42° angle would be to misrepresent it. But it is unclear how the appeal to natural functions can succeed. These functions can be characterized in a variety of ways. One strategy is to hold that the behavior of the Tilt system during the period of natural selection fixes natural functions. For example, one might hold that this system produced E-tilts in response to 40° angles during natural selection, but now they covary with 42° angles. But, it is hard to see why the covariance pattern of the Tilt system must have changed. The assumption thus seems ad hoc.

Another strategy is to appeal to the patterns in which a representation is consumed by consumer systems. The idea behind consumer-based account of content is that facts about how a representation is used by consumer systems are relevant to determining its content. Most existing consumer-based accounts appeal to the way that a representation guides actions as the relevant consumption factor. Accordingly, one strategy for a naturalist can be to hold that the fact that a representation misguides action provides evidence that it is non-veridical. We can call this strategy the action-based strategy. In principle, however, nothing bars the consumer-based accounts to regard the beliefs that are caused by a representation as relevant. Therefore, naturalists might also appeal to a representation's propensity to give rise to false beliefs in order to justify the claim that the representation is non-veridical.³⁰ We can call this the belief-based strategy. In what follows I want to discuss both of these strategies and argue that none of them succeeds.

Visual Dissonance makes us prone to forming false beliefs about the spatial properties of objects. The seeming incompatibility of E-up and E-tilt, for example, makes us prone to forming false beliefs about the sizes of the two angles that they present. For one thing, we form the false comparative belief that the two angles have different sizes. But our non-comparative beliefs can also be false. Suppose you form the belief that the angle presented by E-up is 45° . Naturally, since you also believe that the two angles are not the same size, you will form the belief that the angle presented by E-tilt is not 45° . Since the angles are the same size, at least one of these non-comparative beliefs is also false. In general, if we

³⁰ Note that, we do not have to adopt the view that the content of an experience is determined by the content of the beliefs that it often gives rise to, in order to assume that if an experience often gives rise to false beliefs then it is non-veridical.

assume that the beliefs that the Up-system often causes are veridical, we have to assume that the beliefs that the Tilt-system often causes are non-veridical. This might sound promising for a naturalist who holds that the way that a representation is consumed by the belief systems is relevant to determining its content. However, the strategy fails. Let me elaborate.

But we should note that, even on a consumer-based view, not all cases in which an experience gives rise to false beliefs are cases in which it has non-veridical content. For example, if one associates the concept of maroon with the look of orange things then, despite the fact that one's visual system correctly represents orange things, one might systematically form false beliefs about the color of orange things. Obviously, the perceptual system should not take the blame in such a case. Thus, even a consumer-based view has to respect the distinction between beliefs that are relevant for determining perceptual content and beliefs that are not relevant. How should we distinguish the beliefs that are relevant from those that are not? As the example suggests, belief formation on the basis of perceptual experience depends not only on perceptual content, but also on the conceptual competences of the subject. Any appeal to false beliefs to ground the claim that a perceptual representation is non-veridical has to respect this fact. Accordingly, if misguiding beliefs indicates non-veridicality, at least two conditions need to be satisfied: (a) the experience must systematically cause false beliefs, and (b) the beliefs must be formed under the relevant level of conceptual competence.

The above point helps us see why the belief-based strategy fails. Since there is dissonance, the same spatial quality gives rise to different looks depending on the system that it is presented to. For example, a right angle does not have a single look. Thus if one associates the concept of a right angle exclusively with the looks that it produces in the Up system, then one will be led to form false beliefs when right angles are presented by the Tilt system. But this only reflects a flaw in conceptual competence. In a fully competent user, the concept of a right angle is associated with different looks in the different systems. Such a competent user will not form false beliefs that are caused by dissonance. Thus, in the case of fully competent users, condition (a) fails: dissonant experiences will not systematically cause false beliefs. In the case of not fully competent users who satisfy condition (a) condition (b) fails. It is because the subject lacks the relevant conceptual competences that her experiences systematically give rise to false beliefs. The belief-based strategy thus fails.

The second potential strategy is the action-based strategy. Two ideas underlie this strategy. First, since the Up system and the Tilt system are dissonant then at least one of them must give rise to experiences that systematically misguide actions. Second, if an experience systematically misguides actions, then the experience is non-veridical. I think this strategy also fails.³¹ There are no cases that satisfy both conditions. Let me elaborate.

³¹ The two visual systems thesis (Milner and Goodale 2006) is sometimes taken to show that conscious perceptual representations do not do much by way of guiding actions. But despite the empirical evidence that Milner and Goodale have mustered in support of their thesis, there are good reasons against the idea that the phenomenally conscious experiences do not guide action. This paper is not the place to get into the details of this issue. So I shall set it aside.

Let us start by distinguishing between what we might call doubly-guided and singly-guided actions. Doubly-guided actions involve matching the experiences produced by two different systems. For example, suppose that you are presented with an angle, A , that is facing up and asked to construct a tilted version of the same angle. Suppose that you do this by creating an angle, A' , that seems to you to have the same non-perspectival size as A . Since your experience of A is produced by the Up system and your experience of A' is produced by the Tilt system, this is a doubly-guided action.³²

Due to Visual Dissonance, some doubly-guided actions might systematically go wrong. However, it is the symmetric discrepancy between the systems, not the content of the representations produced by any one of the systems, that is responsible for the wrongness of doubly-guided actions. Thus, although dissonant systems misguide double-guided actions, we cannot conclude from this that one of the systems is non-veridical. In other words, the second condition does not obtain in this case. Therefore, even if we accept the action constraint, the fact that doubly-guided actions go wrong cannot be used to support anti-egalitarianism.

Let us turn to singly-guided actions. These are actions that are guided by a single visual system, e.g., you see a wedge and you want to pick it up by opening your fingers so that the angle between your fingers matches the angle of the wedge (you do this without looking at your fingers.) Suppose that you do this once when the wedge is tilted and once when it is not. Does the dissonance between the Up and the Tilt systems imply that one of them has to misguide your action? The answer is No. It is natural to assume that the connection between action and perceptual experience has to be set up either by learning or by evolution. In those cases where this connection is set by learning, the most likely connection pattern links an experience to an action that is appropriate with respect to the spatial properties that typically produce that type of experience in that particular system. For example, if 40° angles presented to the Tilt system typically produce type E experiences, then learning will teach the action system to associate experiences of type E in the Tilt system with actions appropriate for 40° angles. And if a 40° angle presented in the Up system typically causes type F experiences, then learning will teach the action system to associate experiences of type F in the Up system with actions appropriate for 40° angles. In both cases, learning establishes connections between perception and the action system that give rise to correct actions. The same reasoning applies in the case where the connections between action and experience are set up by evolution. For, the acquisition of evolutionary traits is guided by factors that are similar to learning.

³² Depending on the patterns in which our concepts of spatial properties are associated with experience types, conceptually guided actions can also be regarded as doubly-guided. For example, suppose someone asks you to draw a right angle. Let us call the non-perspectival experience type that right angles produce when presented to the Up system R. If we associate the look of right angles with R, (which is very likely since arguably we learn our geometrical concepts through their presentation in the Up system), then when asked to construct a tilted right angle, we will construct an angle whose processing by the Tilt system gives rise to an experience whose non-perspectival component is R. This action would therefore be doubly-guided.

The above considerations show that the action-based strategy also fails. Due to dissonance, doubly-guided actions are often misguided. However, this does not indicate that one of the systems produces non-veridical experiences. Singly-guided actions are not often misguided because learning compensates for the apparent discrepancy between the two systems. We also saw that the belief-based strategy fails. We can thus conclude that appeals to consumer-based views cannot help the naturalist justify the rejection of Veridicality.

The strategies that we have so far considered treat E-up and E-tilt as *basic* representational types, where a basic representational type is a representational type whose content is not derived or inherited from other representational types. Non-basic representational types, on the other hand, derive or inherit their content from other representational types. An analogy with language helps clarify this distinction. If it is correct that the content of a linguistic expression depends on what the experts know or think, then my utterance of the term “peptic ulcer” inherits its content from the utterances of this expression among experts in the medical community. Therefore, in order to determine the content of my peptic ulcer utterances, we have to look into the experts’ pattern of usage, and as long as I am properly embedded in the linguistic community, my pattern of usage of “peptic ulcer” can be discounted. Similarly, one might think that some representational state types in the brain are non-basic because they borrow their representational contents from more basic state types. But the basic states do not have to be the states of another subject. They might be the states produced by a different system.³³ In particular, some of the experiences produced by the Tilt system might inherit their contents from the same type of experiences produced by the Up system.

To see how this strategy might help ground the denial of Veridicality we can assume that angle experiences are complex with components that represent non-perspectival sizes. Let us call the non-perspectival component that the Tilt system produces in response to 42° angles E_{np} . In principle, the Up system can give rise to E_{np} experiences too. But due to dissonance, the non-tilted angles that normally give rise to E_{np} are different from the tilted ones. Let us say that the Up system gives rise to E_{np} experiences in response to upward facing 44° angles. This raises a question: what is the content of E_{np} experiences? We seem to have two options. First, we might divide the class of E_{np} experiences into two, holding that those that are produced by the Tilt system represent 42° and those that are produced by the Up system represent 44°. This is the option that in my view we should adopt. But another option is to privilege one of the systems, say the Up system. On this option, since the Up system gives rise to E_{np} experiences in response to 44°, the content of E_{np} ’s is 44° in both systems. This is similar to treating the Up system as the expert and the Tilt system as the follower the content of whose representations is determined by the expert. Under this view, it would follow that in giving rise to E_{np} experiences, the Tilt system normally misrepresent tilted 42° angles as 44°.

This strategy can work in principle. But to avoid the charge of making an ad hoc choice, the naturalist has to offer an explanation for the privileged treatment of the Up system.

³³ Fodor’s idea of asymmetric dependence in Fodor 1990 falls under this strategy.

But it is unclear how this might go. One option is to justify the privileged treatment of the Up system by arguing that it is a better detector of angles than the Tilt system. Admittedly, it is harder to discern the size of an angle when it is tilted. However, after our discussion of belief-based strategies, it should be clear that this difference is better explained in terms of our competence in using spatial observational concepts.

Another option is to argue that the Up system is a better detector of angles because the computational steps that are required for processing angle sizes by the Up system are simpler and are therefore less prone to error than the computational steps that are required for processing angles sizes by the Tilt system. The perspectival size and the non-perspectival size of tilted angles come apart from each other, but the perspectival size and the non-perspectival size of non-tilted angles coincide. Since the proximal patterns of stimulus correspond to perspectival sizes, one might hold that the computational processes that help determine the non-perspectival size of angles are shorter and less prone to error when these angles are not tilted. The Up system, as it were, just copies the non-perspectival size of angles from the patterns of retinal activation, while the Tilt system has to compute them from perspectival sizes.

The problem with this argument is that it assumes that our brains know the degree of tilt of angles before processing their non-perspectival sizes. If our brain already knew that an angle is not tilted then perhaps the Up system could employ a simpler computational strategy than the Tilt system to compute non-perspectival sizes. But, the brain has no way to know that an angle is tilted or not before computing a degree of tilt.³⁴ So there does not seem to be any plausible way for the naturalist to argue that computing the size of non-tilted angles is computationally simpler than computing the size of tilted ones.

A third option is to hold that the visual system primarily evolved to represent upward facing angles and the detection of tilted angles is secondary to this function. This also seems to be an ad hoc assumption. For, it is not clear why the detection of upward facing angles might be fitness conducive while the detection of tilted angles is not. I think it is safe to conclude that a natural difference between the two systems that would justify the privileged treatment of the Up system cannot be found. In the absence of such a feature, treating the representation produced by the Tilt system as non-basic would be ad hoc and unjustified. Thus the appeal to the distinction between basic and non-basic representations also fails.

I think that the main possible naturalist strategies to resist Veridicality have been discussed and rejected. I have showed that appeals to teleological factors, consumer systems, and the distinction between basic and non-basic representational contents do not succeed without ad hoc assumptions. So it is safe to conclude that naturalists are committed to Veridicality.

But the naturalist might protest that I have stacked the cards in my favor. Given that naturalistic accounts of content are still in an under-developed stage, it is not easy to

³⁴ There is no reason to assume that our brains form the default assumption that things are presented non-tilted unless there is reason to the contrary.

delineate the possible shape they might take in the future and thus impossible to fully delineate the strategies that they might have to convince us that the Tilt system gives rise to non-veridical experiences.³⁵

I am not convinced that the above worry presents a strong challenge to my arguments. Suppose that a basic representational state systematically gets activated by a spatial property in ideal conditions, the system that gives rise to this experience is non-defective and there is no reason to assume that its natural function is not to represent that spatial property. Furthermore, this state does not misguide actions and is not responsible for the formation of false beliefs. Nevertheless, we have a proposed theory that implies that the state is a misrepresentation. I believe that in such a case we would have a good reason to reject the theory because we have a good reason to reject this implication. For, it is very counterintuitive to hold that a representational state that satisfies all the above conditions is a misrepresentation. If you find this argument convincing, then you have no reason to assume that the available options for the naturalist have been underestimated. This ends my defense of the claim that naturalistic theories of content have to accept Veridicality. We should conclude that as naturalists Standard Representationalists are committed to Veridicality.

³⁵ Byrne and Hilbert 2006 give a similar response to Pautz 2006.