

# Whither naïve realism? – I

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## Abstract

Different authors offer subtly different characterizations of naïve realism. We disentangle the main ones and argue that illusions provide the best proving ground for naïve realism and its main rival, representationalism. According to naïve realism, illusions never involve perceptual error. We assess two leading attempts to explain apparent perceptual error away, from William Fish and Bill Brewer, and conclude that they fail. Another leading attempt is assessed in a companion paper, which also sketches an alternative representational account.

## 1 | WHAT IS NAÏVE REALISM?

The meaning of “naïve realism” has mutated over the last century or so, perhaps not for the better. Abraham Wolf, Reader in Logic and Ethics at University College London, characterized it in 1909 as “the cognitive attitude of the so-called plain man” (Wolf 1909: 144). Russell’s more widely known characterization restricts this attitude to perception:

...we all start from “naïve realism”, i.e. the doctrine that things are what they seem. We think that grass is green, that stones are hard, and that snow is cold. But physics assures us that the greenness of grass, the hardness of stones, and the coldness of snow, are not the greenness, hardness, and coldness that we know in our own experience, but something very different... Naïve realism leads to physics, and physics, if true, shows that naïve realism is false. Therefore naïve realism, if true, is false; therefore it is false. (Russell 1940/85: 15)

Here naïve realism is the view that the manifest and the scientific images can happily coexist. Greenness “as we see it” can be a feature of grass even though physics tells us grass is entirely composed of colorless particles. That is not “naïve realism” as understood in contemporary philosophy of perception, although it is related. Contemporary naïve realists like John Campbell not only take grass to be green, but hold that color perception reveals the chromatic nature of grass, uncontaminated by any parochial human sensibility. As Campbell puts it:

[T]he phenomenal character of your experience, as you look around the room, is constituted by the actual layout of the room itself: which particular objects are there, their intrinsic properties, such as colour and shape, and how they are arranged in relation to one another and to you. (Campbell 2002: 116)

Much later than Russell, “naïve realism” was sometimes understood as *direct* realism—roughly, the denial of the sense datum theory. For example, the third chapter of Richard Fumerton’s 1985 book *Metaphysical and Epistemological Problems of Perception* begins: “Almost every book on perception written in the twentieth century has a chapter on naïve or direct realism” (Fumerton 1985: 73; see also Searle 2015: 15). Fumerton distinguishes epistemological and metaphysical versions of naïve or direct realism; two of the latter versions are of particular interest here:

- (R1a) In *all* sense experience we are directly or immediately acquainted with parts or constituents of physical objects.
- (R1b) In *veridical* sense experience we are directly or immediately acquainted with parts or constituents of physical objects. (74, second emphasis added)

Contemporary characterizations of naïve realism tend to follow (R1a) and (R1b) in either stressing acquaintance or otherwise suggesting some particularly intimate connection between sense experience and physical objects. They also tend to follow (R1b) in making naïve realism primarily a thesis about veridical experience, not illusion or hallucination. For example, here is Adam Pautz stating one of the “basic claims” of naïve realism:

[T]he *naïve account of normal experience*: Plus or minus a bit, the character [of] your visual experiences, in normal cases, is grounded in your experiential acquaintance with objective, response-independent states of the external world. Differences in veridical experiences are grounded in differences in what states you experience. (Pautz 2021: 192)<sup>1</sup>

Pautz calls illusions and hallucinations “abnormal experiences” (6-7); “normal experiences” are the veridical ones.

Fumerton’s formulations are not naïve realism as Pautz understands it. For Fumerton, naïve realism is a thesis about the “directness” of our perceptual relations to physical objects; for Pautz, it is a thesis about “(phenomenal) character”.<sup>2</sup> The quotation from Pautz above goes on to cite the earlier passage from Campbell as an example of naïve realism.<sup>3</sup> Here are two other characterizations of naïve realism along similar lines:

According to the naïve realist, in the good cases of perception, external objects and their properties ‘shape the contours of the subject’s conscious experience’. (Fish 2010: 96, quoting Martin 2004: 64)

[E]xternal things such as trees, tables and rainbows... and the properties which they can manifest to one when perceived... determine the phenomenal character of one’s experience. (Martin 1997: 93)

However, Craig French and Ian Phillips, in the course of defending naïve realism, *deny* that “external objects and their properties ‘shape the contours of the subject’s conscious experience’”, at

least as Fish understands that phrase. Specifically, French and Phillips deny what they call “the Difference Principle”:

**Difference Principle:** Necessarily, if two experiences differ in phenomenal character, then they differ in character-constituting presented elements. (French and Phillips 2020: 4)

According to the Difference Principle, the phenomenal character of an experience cannot differ without the manifest properties of “external things such as trees” also differing.<sup>4</sup> In other words, those manifest properties “determine the phenomenal character of one’s experience”. French and Phillips are card-carrying naïve realists who do not agree.<sup>5</sup> For them, manifest properties at most *partially* shape the contours of the subject’s experience.

If naïve realism is not, or not primarily, a thesis about phenomenal character, what is it, then? Here is another thesis that is frequently attributed to the naïve realist, that external objects and properties are “constituents” of perceptual experience:

Some of the objects of perception—the concrete individuals, their properties, the events these partake in—are constituents of the experience...when one is veridically perceiving the objects of perception are constituents of the experiential episode. The given event could not have occurred without these entities existing and being constituents of it... (Martin 2004: 39, 56)

[N]aïve realists hold that perceptual experiences have the conscious characters they do partly by having such aspects of the mind-independent world as *constituents*. The conscious visual experience you have of the oak has that very tree as a literal part. (French and Phillips 2023: 363)

The “constituents” of experiences in these two quotations are objects and properties; sometimes the constituents are taken to include facts:

[w]hen a subject is perceiving veridically, then the fact perceived is itself ‘made manifest’ to the subject and is constitutive of his experience. (Martin 2002: 399)<sup>6</sup>

Notice that the first of the above three quotations also makes a further claim about essence: not only is the oak a constituent of your experience of it, but it is an essential constituent: your experience could not have occurred without having the oak as a constituent. And that *is* a further claim: this twig is a constituent of the oak, but not an essential constituent, because the oak can survive its loss.

Finally, another common feature of the naïve realist position is the denial that perceptual experience is *representational*:

For the naïve realist, insofar as experience and experiential character is constituted by a direct perceptual relation to aspects of the world, it is not constituted by the representation of such aspects of the world. This is why many naïve realists describe the relation at the heart of their view as a *non-representational* relation. (Crane and French 2021: sect. 3.4.1)

The Naïve Realist... claims that our sense experience of the world is, at least in part, non-representational. (Martin 2004: 39)

Naïve realism holds that in veridical perception, there is no *representational* content of the perceptual state. The only “content” is the entity or entities that are perceived. (Burge 2005: 40; see also Burge 2010: 148 fn. 23)

An interesting answer to the titular question of this section will not simply canvas the views of self-declared naïve realists. Naïve realism should turn out to be a significant, tolerably clear, and reasonably well-motivated view. With these desiderata in mind, we now turn to arguing for our preferred answer, that the three quotations above state the core of naïve realism. The naïve realist rejects perceptual representation in favor of something allegedly more intimate—acquaintance.

## 2 | NAÏVE REALISM AND ILLUSION

The intuitive motivation for naïve realism is a convenient place to start. Almost without exception, naïve realists begin with reflection on ordinary perceptual experience—in the case of vision, good lighting, an unobstructed view of commonplace objects, and a perceiver with a normal visual system, focusing on the scene.<sup>7</sup> Here (it is natural to think), perception does not lead one astray.

One phenomenological point will be agreed upon by all sides—at any rate, we are not going to dispute it. In ordinary visual perceptual experience, one seems simply to be aware of the scene before the eyes. There is the red tomato, rolling slowly across the kitchen table. Seeing the rolling tomato is importantly different from reading about a rolling tomato, or watching a video on one’s phone of the rolling tomato, or seeing the tomato “blurrily”, without one’s contact lenses. In reading about the tomato, one is aware of words on the page; in watching the video, one is aware of the array of colored pixels; in seeing the tomato blurrily there is at least a suspicion that one is aware of some feature of one’s visual apparatus, or perhaps some feature of one’s visual experience, in addition to the tomato.<sup>8</sup> But in the ordinary case, there is (apparently) nothing else to be aware of. In that sense, ordinary perceptual experience is “transparent”.

Since the thesis of “transparency” is often understood more broadly, as covering experience in general, including illusions and cases of blurry vision, let’s call this restricted kind of transparency *ordinary-transparency*.

Sometimes a further claim is added to the intuitive starting point, namely that the objects of perceptual experience, for instance the tomato, are “mind-independent”: “our sense experience is transparent—... experientially we are presented with a mind-independent realm” (Martin 2004: 39). This is not to say that the tomato is presented *as* mind-independent (whatever that comes to, exactly), just that it is in fact mind-independent.<sup>9</sup> But little weight should be put on this addition: if it turns out that tomatoes and the like are ideas in the mind of God, that would not affect the dispute between the naïve realist and her rivals.

Representationalists frequently side with naïve realists, and accept ordinary-transparency: seeing the rolling tomato on the table, it seems that one is simply aware of the tomato, that it is red and rolling, of the table, that it is brown and rectangular, and of other aspects of the scene before the eyes. How can that be, if—as the representationalist claims—vision *represents* that the tomato is red and rolling? Doesn’t representation require *representations*—words on a page, patterns of pixels on a screen, for instance? Let’s grant that representations are needed. Perhaps vision represents the tomato by means of neural representations—words in the neural “language of vision”, or picture-like neural icons, or a combination of both.<sup>10</sup> And perhaps these representations have

propositional contents (e.g., that rectangle is brown), or perhaps their contents resemble the contents of complex noun phrases (e.g., “that brown rectangle”).<sup>11</sup> However, the representationalist will insist that such representations, unlike words on the page or pixels on a screen, are not themselves among the objects of perceptual awareness. These representations facilitate vision: they are things we see *with*, not things we *see*. There is thus no conflict, according to the representationalist, between representationalism and ordinary-transparency.<sup>12</sup>

That may be too quick. There is a whopping difference between *believing* that a red tomato is rolling on the kitchen table, and *seeing* the rolling tomato. There is less felt distance between *visualizing* a rolling tomato and seeing one, but at least in typical cases these are palpably different kinds of phenomena. Veridical perception puts us in touch with our environment in a way that belief and imagination don't. It is no accident that many theorists of perception have found it more natural to use the language of “presentation” rather than “representation”. Perception *presents* the environment to us: later we may *represent* it, in belief or episodic memory.<sup>13</sup>

Admittedly this is rather impressionistic. But it is perhaps enough to motivate a search for a non-representational account of veridical perception, on which perception does not *represent* our environment, but rather affords—as Pautz puts it, quoted earlier— “*acquaintance* with objective, response-independent states of the external world”. Here “acquaintance” is just a label for the hypothesized non-representational relation. A positive characterization of acquaintance, although desirable, is not necessary, because the main claim is that a representational relation will not do the trick. Representation, on this view, might account nicely for belief and imagination, but it cannot account for ordinary transparency.<sup>14</sup>

If a non-representational account of veridical perception can be made to work, then a representational account of illusion seems implausible. If illusion is perceptual *misrepresentation*, then veridical perception is surely *correct* representation. Conversely, if veridical perception is non-representational, neither is illusion.

We have arrived at naïve realism's core: conscious perception, veridical or illusory, is non-representational. (Hallucination we can leave as a special case.<sup>15</sup>) Naïve realism, so understood, is motivated by the suspicion that mere representation cannot account for ordinary transparency.<sup>16</sup> Other claims associated with naïve realism—for instance the Difference Principle, or that external objects are constituents of experiences—are not clearly motivated in this way and may be regarded as optional extras.

Is veridical perception a matter of correct representation, or non-representational acquaintance with the environment? We can gain traction on this question by considering illusions, which provide the clearest way to referee the dispute between the naïve realist and the representationalist. According to the representationalist, they involve perceptual misrepresentation. According to the naïve realist, they do not.<sup>17</sup> But—unlike the case of veridical perception—here the naïve realist must say more. Viewing a half-submerged straight stick, it looks bent. Presumably we are not acquainted with the straightness of the stick. We cannot be acquainted with the bentness of the stick, because it isn't bent. So what is going on? In the remainder of this paper we investigate whether William Fish or Bill Brewer have given an adequate naïve realist account of illusion.

### 3 | REPRESENTATIONAL AND NON-REPRESENTATIONAL ACCOUNTS OF ILLUSION

Illusions are standardly described as cases where an object is perceived, but it looks or appears other than it is. For instance:

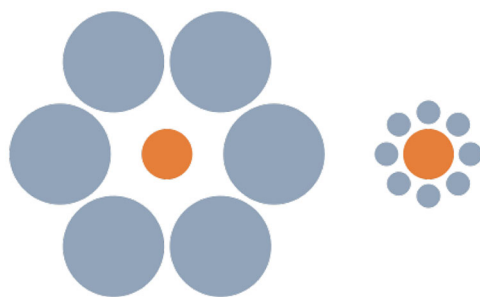


FIGURE 1 The Ebbinghaus illusion.

The term “illusion” is to be understood here as applying to any perceptual situation in which a physical object is actually perceived, but in which that object perceptually appears other than it really is, for whatever reason. (Smith 2002: 23)

Some care is needed here, because although “perceptually appears” might be a term of art, “looks”, “sounds”, “smells” and other perceptual verbs are not. Focusing on “looks”, one complication is that it is doubtful that there is any sense of the word that can be used to capture visual illusions, as these are understood in the philosophical and scientific literature. For example, in the Ebbinghaus illusion, two equally-sized circles look different in size because they are surrounded by differently sized circles (see figure 1).

If we imagine that the rightmost inner circle is a watch-face encrusted with diamonds and subdials, and the leftmost circle is a simple plastic watch-face, one could truly say “The right watch looks larger and more expensive than the left one.” In this sentence the verb “looks” is forced to have the same interpretation with the complements “larger” and “more expensive”. Yet if the right watch is a cheap imitation Patek Philippe and the left watch is a costly minimalist design, this will not be touted as a striking visual illusion of relative price. Here is a non-comparative version of this point: if a cheap watch looks expensive there need be no visual illusion.<sup>18</sup>

Fortunately, we need not wade into the literature about the semantics of perceptual verbs, since the category of visual illusions has some paradigms—for instance the Ebbinghaus illusion—and we can concentrate on those, without trying to define them in terms of “looks” or “appears”.

All sides agree that the right inner circle in figure 1 looks larger than the left one. Further, all sides agree that there is a distinction between perception and cognition, a reasonably clear boundary between perception, or perceptual experience, and perceptual belief or knowledge. Without such a boundary, the dispute between the naïve realist and her opponents would make little sense: naïve realism is a thesis about perceptual experience, not about perceptual judgement (which all sides agree is a matter of representation). Why does the right circle look larger? The representationalist offers an explanation that puts “larger” on the perceptual side of the boundary: the circle looks larger because it is represented by the visual system as being larger. This should be understood as a constitutive explanation, not a causal one.

Given what we said above about “looks”, a representationalist does not have to endorse this sort of explanation across the board. For instance, a representationalist might deny that a Patek Philippe watch looks expensive because it is represented by the visual system as being expensive. Instead, the visual system represents a cluster of low-level properties, the visual signature characteristic of expensive watches. But when a case of “looking F” is a paradigm of a visual illusion, a *representationalist account of illusion* will give an explanation that involves the *visual*

*representation of Fness*: the object looks F at least in part because it is represented by the visual system as being F.<sup>19</sup>

A representationalist account of an object's illusorily looking F has a lot in its favor. Standard indicators of perception rather than cognition—adaptation, rivalry, and pop-out, among others—suggest that a representation of Fness is on the perceptual side of the perception-cognition boundary.<sup>20</sup> The Ebbinghaus illusion, for instance, can make a circle “pop-out” of a display of other circles.<sup>21</sup> And certainly nothing sophisticated on the cognition side is required: 4-day old chicks and at least some fish are subject to the illusion.<sup>22</sup>

The naïve realist must give a *non-representational* account of illusion. One strategy is to concede that the (non-F) object looks F, and to explain this fact without putting Fness on the perceptual side of the perception-cognition boundary. But another strategy is to deny that there is any such fact to explain: the (non-F) object does *not* look F, despite our inclination to think it does. Of course, the naïve realist who takes this strategy needs to explain why we mistakenly think the object looks F. Here is one possibility: the object is in fact G and looks G, and this (somehow) leads us to mistakenly describe it as looking F. Another possibility is that there is no such G: the object does not look any (relevant) way. That would be to treat illusions as Fish treats hallucinations: there is no (relevant) phenomenal character, just the typical downstream cognitive effects of an F-object that looks F (Fish 2009: ch. 4). Fish himself does not extend his account of hallucination to cover illusions for good reason, and we will set aside this second radical naïve realist response.<sup>23</sup>

Fish himself adopts the first and the second strategies in dealing with illusion. Brewer exclusively adopts the first strategy. As we will see, Fish and Brewer implement the first strategy in very different ways.

#### 4 | FISH: OPTICAL AND PERCEPTUAL ILLUSIONS

Fish holds that the phenomenal character of an experience is fully determined by those elements of the environment with which the experience acquaints the perceiver—the “presented elements”, in French and Phillips’s terminology:

[T]he phenomenal character of a visual experience is the property of acquainting the subject with a selection of the facts that inhabit the tract of the environment the subject perceives. (Fish 2009: 75)

Fish thus endorses the Difference Principle (see section 1). If the phenomenal character of an experience *just is* its property of acquainting the subject with certain facts, then presumably any change in the phenomenal character of an experience must involve some change in the facts—Fish’s choice for the “presented elements”—with which one is acquainted.<sup>24</sup>

Fish divides illusions into three classes, which he treats separately. With a complication to be noted shortly, two of them are (in our terminology, not Fish’s) *optical* illusions and *perceptual* illusions.<sup>25</sup> (We will not discuss Fish’s third category of “cognitive illusions”.<sup>26</sup>) Optical illusions, according to Fish, are those that can (allegedly) be fully explained by the retinal stimulus produced by the external environment. The “illusory appearance... is purely a matter of what is going on in the world and how that affects the pattern of light that impinge upon the subject” (148). In this category Fish includes the half-submerged-stick illusion and certain spatial and color illusions.

Like optical illusions, perceptual illusions “are similarly predictable and intersubjective” (148) but, unlike optical illusions, they “cannot be *completely* accounted for by appeal to the way things

in the world affect the patterns of light incident on the retina” (149). Instead, we must appeal to internal characteristics of the perceiver or the perceptual system. In this category Fish includes familiar examples like the Müller-Lyer, Ebbinghaus, and Ponzo illusions.

Let’s look first at what seems to be a straightforward case of an optical illusion, the half-submerged stick. Why does it look bent? The representationalist says that this is because it is represented by the visual system as being bent. Fish has a rival explanation:

to explain why the stick in water appears bent, we need only appeal to the natural physical phenomenon of light being refracted as it passes through materials of different refractive indices. In a sense, then, the explanation of the illusion... is complete by the time we get to the subject. (148)

How is this explanation supposed to work? Fish is not explicit, but he must have something like the following in mind. If we ignore the peculiar displacement seen at the boundary between the water and the air, the straight stick in water projects the same image on the retina as an appropriately bent stick out of water. Normal perceivers, in similar states of adaptation and so forth, who receive the same retinal stimulus, will enjoy the same phenomenal experiences, give-or-take a bit: that is, things will look near enough the same. And a bent stick out of water looks bent (to normal perceivers). Hence the straight stick in water also looks bent.<sup>27</sup>

This is a fine explanation of why the straight stick in water looks bent, as far as it goes. But notice that the explanation appeals to the fact that a bent stick out of water *looks* bent. Fish may have explained why the straight stick looks bent, but why does the *bent* stick look bent? The representationalist will explain this (at least in part) by saying that the visual system represents it as bent. The naïve realist must offer a different explanation. And since this is the veridical case, one is ready to hand: the bent stick looks bent because the perceiver is “acquainted with” the fact that the stick is bent. Adding this second explanation to the first one allows the naïve realist to offer an explanation of the half-submerged-stick illusion without appealing to perceptual representations.

Still, this is not entirely satisfactory. What exactly is going on, according to Fish, when we see the straight stick as bent? We can’t be acquainted with the fact that the stick is bent, because it isn’t. If the “phenomenal character of a visual experience is the property of acquainting the subject” with some environmental facts, then the naïve realist needs to exhibit the relevant facts in the half-submerged-stick illusion.

We will get back to this later, after discussing another example that Fish puts in the category of (in our terminology) optical illusions, namely simultaneous color contrast. This is the phenomenon of the dependence of apparent color on the color of the surround. A sky-blue square against a white background looks sky blue; “against a red background... the blue square looks or appears greenish” (155).

Can this illusion be explained in the manner of the half-submerged stick? The half-submerged straight stick stimulates the retina as a bent stick out of water would—that is why the straight stick looks bent. So let’s compare the greenish-looking sky-blue square (the “half-submerged straight stick”) against a red background with a greenish-blue square (the “bent stick”) against a neutral background. The sky-blue square looks just like the greenish-blue one, just as the half-submerged straight stick looks just like the bent one. But here the analogy breaks down. The blue square and the greenish square do *not* send the same color signal to the eye (and neither of course do the two backgrounds). No explanation analogous to the one Fish gives of the appearance of the straight stick will work for the appearance of the blue square. Although Fish classifies these two illusions together, by his lights examples of color contrast belong among the *perceptual* illusions, those that



“we cannot explain our susceptibility to... purely by appeal to how things in the world affect the light impinging upon our retinas” (173).

As with the straight stick that looks bent, Fish needs to explain why the sky-blue square looks greenish-blue. We can't be acquainted with the fact that it is greenish-blue, because it isn't. Fish has to find some other fact to be the object of acquaintance, and to that end he draws a distinction between colors—“red or green or burnt sienna” (156)—and (what he calls) “shades.” The colors are non-relational properties—whether the square is sky blue does not depend on the illuminant or the surround, for instance. The sky-blue square placed against a red background remains sky blue. However, although it does not change *color*, it does change *shade*. That is because “the shade a particular exhibits, while determined in part by its intrinsic color, is nonetheless a relational property of the particular”, depending on “things outside itself—the spectral distribution of the illuminant and the reflectance properties of the surround” (158).<sup>28</sup> And this gives us the sought-after fact that we are acquainted with when we see the sky-blue square against a red background:

With this account in hand, the naive realist can hold that the fact that the subject is acquainted with in a fine-grained color experience is not the fact of an object's being a particular color, but rather the fact of an object's exhibiting a particular (relational) shade. (158)

Viewing the sky-blue square against a red background, someone might take the square to be greenish-blue. That would be a mistake, but the error is on the side of cognition rather than perception. The subject sees the shade of the square, a shade that is normally paired with the color greenish-blue. That is why the subject judges that the square is greenish-blue. But in this case the shade and the color come apart: that is why the subject's judgment is mistaken.

Color contrast examples are thus in an important sense not illusions at all. The sky-blue square seen against a red background “is in fact a special case of veridical perception that involves the successful perception of somewhat unusual facts” (172). And to return to the half-submerged stick, Fish clearly adopts a similar account, although he doesn't spell out the details. Seeing the straight stick half in water, we veridically perceive its projective shape—the shape it optically projects to the frontoparallel plane (see 159–60), or something else along these lines.<sup>29</sup>

The idea that these “illusions” are really cases of veridical perception is not well-motivated. By whatever means the visual system manages to achieve “successful perception”, it isn't magic. Further, everyone agrees that the task is very difficult: retinal stimulation radically underdetermines the perceiver's environment. It is amazing enough that successful perception is achieved so frequently. That successful perception is far more widespread than vision scientists usually think is a dubious conjecture on its face.

Another worry is that the properties that are allegedly veridically perceived are not of ecological relevance—what matters if you want a stick to fish for termites is its shape, not its current optical projection.<sup>30</sup> And if you want to know whether a blueberry is ripe, you need to know its color, not (or not just) its shade (in Fish's sense). All else equal, we would not expect perceptual systems to expend resources on gathering information of marginal benefit. Relatedly, if the projection of the half-submerged stick is perceived but the stick's shape is not, why would a naïve perceiver take the stick to be bent? If the answer is that this is because the projected shape is bent, why suppose that we perceive the shape of the bent stick out of water? Wouldn't the perception of its bent projection suffice to explain why a naïve perceiver would take it to be bent?<sup>31</sup>

Clearly much more could be said, but for space reasons we will leave it here and turn to Fish's treatment of the illusions that he puts into the second category—perceptual illusions.

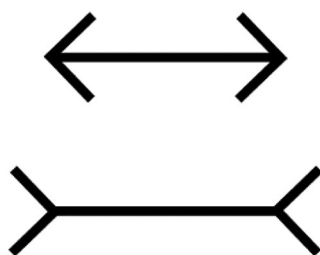


FIGURE 2 The Müller-Lyer illusion.

The Ebbinghaus illusion (figure 1) is one of Fish's perceptual illusions. Could it, like the half-submerged stick illusion, "involve the successful perception of somewhat unusual facts"? Given that the "unusual fact" in the case of the stick concerns its bent projective shape, a similar account of the Ebbinghaus illusion is not in the cards. The projective shapes of the straight stick in water and the straight stick out of water are different, but the projective shapes and sizes of the right and left inner circles are identical. Presumably for this reason, Fish's explanation of illusions like the Ebbinghaus and Müller-Lyer is quite different.

Fish agrees that the half-submerged stick in water looks bent. He seems to deny, however, that the right Ebbinghaus circle looks larger than the left, and that the bottom line in the Müller-Lyer illusion looks longer than the top (see figure 2).

As with optical illusions, the Ebbinghaus and Müller-Lyer do not lose their potency once the measurements of the figures are revealed. Usually this is put by saying that the bottom line continues to *look* longer, even when we know that it is not. Fish suggests that we merely *believe* that it looks longer:

[S]uppose we ask the [knowledgeable] subject whether the lines look to be the same length. Because the subject would still be, *ex hypothesi*, subject to the illusion, the subject would claim (and thereby express his belief) that it looks as though the arrows-out line is longer than the arrows-in line. . . while the well-informed subject of the Müller-Lyer illusion no longer entertains the judgment that the arrows-out line is longer than the arrows-in line, he does yet entertain the *judgment* that it seems to be longer. *The belief that it looks as though one line is longer than the other* could then be appealed to in order to explain why the subject claims that the lengths of the two lines still look different: because that is precisely what the subject judges to be the case. (175, emphasis added)

Why do the surrounding circles in the Ebbinghaus and the arrowheads in the Müller-Lyer result in mistaken beliefs about how things look? Because, Fish says, these features lead the subject to "passively deploy an inappropriate conceptual-recognitional capacity" (173-174). For instance, the arrowheads lead the subject to passively deploy a conceptual capacity to recognize lines as unequal. Fish does not explain, however, why passive deployment of a recognitional capacity for inequality generates the mistaken belief that the lines *look* unequal.

That is one problem for Fish's account of the Ebbinghaus and Müller-Lyer illusions. Another is that the "passive deployment of a recognitional capacity" for unequal lines seems to involve *representation* of inequality. That helps Fish only if this representation is on the cognition side of the perception-cognition border. But it is most implausible that it is. As with the Ebbinghaus

illusion, the Müller-Lyer illusion does not require sophisticated cognitive processing. It is present in primitive nonhuman animals, and occurs early enough to induce pop-out in visual search.<sup>32</sup> And if Fish's account of the Müller-Lyer illusion appeals to representations of inequality formed within the visual system, then it is unclear how it differs from the representationalist's.

## 5 | BREWER: VISUALLY RELEVANT SIMILARITIES

Brewer takes a very different approach to illusion than Fish, partly because his version of naïve realism is different. For Fish, perceptual experience is a matter of conscious acquaintance with various environmental *facts*. For Brewer, facts are swapped out for objects:

[P]erceptual experience is a matter of a person's conscious acquaintance with various mind-independent physical objects *from a given spatiotemporal point of view, in a particular sense modality, and in certain specific circumstances of perception (such as lighting conditions in the case of vision)*. These factors effectively conjoin to constitute a third relatum of the relation of conscious acquaintance that holds between perceivers and the mind-independent physical direct objects of their perceptual experience (Brewer 2011: 96)

Whether Brewer's view is compatible with the Difference Principle depends on the role of the "third relatum" invoked in the above passage (see French and Phillips 2020: 9). On one interpretation, factors like point of view and circumstances play an *availability* role: they "select" which elements of the scene the perceiver can be acquainted with. On another interpretation, such factors affect the "ways" in which we are acquainted with the elements of the scene.

The first interpretation is compatible with the Difference Principle, while the second is not. On the first interpretation, phenomenal differences between experiences had from different points of view, or in different circumstances, would go along with differences in the elements with which the perceiver is acquainted. Seeing the stick half-in water might acquaint us with its optical projection; seeing the same stick out of water might acquaint us with its straightness. But on the second interpretation, different points of view or circumstances are compatible with the same presented elements. Seeing the stick in and out of water might acquaint us with the stick and its straightness both times, but in different ways.

Unlike Fish, Brewer does not argue that some cases of illusion involve the perception of an "unusual fact". Neither does he argue that in some other cases of illusion the perceiver is mistaken about how things look. Instead, he grants that in all cases of (visual) illusion "a mind-independent physical object, *o*, looks *F*, although *o* is not actually *F*" (Brewer 2011: 135), and offers an analysis of "looking *F*" in terms of "visually relevant similarities". For simplicity, we will ignore complications about "looks" discussed in section 3, and assume that the analysis just applies to cases where the representationalist would explain an object's looking *F* in terms of the representation of *Fness*.

Brewer's analysis is supposed to render the representationalist's constitutive explanation of illusions redundant. Compressing the "point of view" into the "circumstances", it is this:

*o* looks *F* to *S* iff *S* is visually acquainted with *o* in circumstances relative to which *o* has visually relevant similarities with paradigms of *Fness* (see Brewer 2011: 121, 135).<sup>34</sup>

This has two crucial pieces of terminology that need explaining: “visually relevant similarities” and “paradigms of Fness”. Of course, Brewer needs to explain them in a way that does not appeal to the target notion of looks. But even if he succeeds in doing that, it is not clear why the representationalist should be bothered. Why would a reductive analysis of X that doesn’t mention Y mean that Y is otiose in a constitutive explanation of X? We will not pursue this objection, however, because—as we are about to argue—Brewer’s reductive ambitions are unlikely to be fulfilled.

Let’s begin with the two pieces of terminology. First, what are “visually relevant similarities”? Brewer explains:

Visual similarities are similarities by the lights of visual processing of various kinds. Objects have visually relevant similarities when they share sufficiently many common properties amongst those that have a significant involvement in the various processes underlying vision. Thus, and very crudely, visually relevant similarities are identities in such things as the way in which light is reflected and transmitted from the objects in question, and the way in which stimuli are handled by the visual system, given its evolutionary history and our shared training during development. (2011: 103)

This definition is very broad. Objects can have visually relevant similarities either because they interact with light in the same way or because they are “handled by the visual system” in the same way, though Brewer is careful to deny that the latter sort of similarity includes similarities in how the objects are represented (2011: 102–103). In any case, most of Brewer’s examples invoke the former type of similarity (2011: 102, 106–108). For example, a circle viewed at a slant and an oblong ellipse viewed head-on have a visually relevant similarity in virtue of supplying similar retinal projections (Brewer 2013: 425).

According to Brewer’s analysis, an object may look F although it isn’t actually F in virtue of exhibiting visually relevant similarities with paradigm Fs. How does this work in the case of the half-submerged stick? Here is Brewer’s explanation of why the straight stick looks bent:

[I]t looks bent in virtue of its visually relevant similarities with an unsubmerged bent stick that has its top half coincident with the unsubmerged half of the stick seen and its bottom half in the position of the relevant virtual image of the bottom half of the latter from the subject’s point of view and given the refractive index of the liquid in question. In what sense are these two things similar? In the region of space in the vicinity of the eye—that is to say in the region above the refracting surface of the liquid as things actually are—light from corresponding parts of the two sticks travels, or would travel, along the same paths. Given the way that the liquid actually refracts light from the submerged portion of the stick seen, the visually relevantly similar stick described is a paradigm bent stick. Thus, the partially submerged stick *looks bent*. (2011: 106)

This explanation is close to Fish’s: the straight stick in water sends light to the eye as a bent stick out of water would. But there is a crucial difference. Fish’s explanation (as we understand it) appeals to the fact that the bent stick out of water *looks bent*. Brewer’s explanation, by contrast, does not explicitly mention how the bent stick looks at all. Instead, Brewer appeals to the fact that the bent stick out of water is a “paradigm” of bentness. What does that mean? Paradigm exemplars of a kind are:

instances of the kinds in question, whose association with the terms for the kinds partially constitutes our understanding of those terms, given our training in the acquisition of the relevant concepts. (104)

More specifically, Brewer regards an exemplar as a paradigm of a kind when it is in a circumstance which makes it “a perfectly appropriate exemplar for the acquisition” of the concept of that kind, and for “guidance in its subsequent application” (107).

However, this explanation seems to rely on the very notion of an object’s *looking F* that Brewer is supposed to be analyzing. Imagine a stick bent at an obtuse angle. If the stick is viewed perpendicular to the angle it will look bent. But if it is rotated ninety degrees (and if no depth cues are present) it will look straight. Why is the stick an appropriate exemplar for acquiring the concept of bentness in the first circumstance and not in the second? The obvious answer is that it *looks bent* in the first circumstance but not in the second, which the representationalist will explain in terms of the visual representation of bentness. But if this is right, then Brewer has not yet offered a reductive analysis of *looking F*, and so has not offered a genuine alternative to the representationalist view.<sup>34</sup>

Brewer has recently revised his account of paradigm exemplars in a way that might deal with this problem, but (we will argue) that only succeeds in moving the bump under the rug elsewhere. According to Brewer’s revised account, paradigm exemplars of *F* are to be construed as “actual exemplars of *F* in situations in which [the perceiver] may be [visually acquainted] with their *Fness*” (Brewer 2019: 367), or as “instances of the observable *Fs* in situations in which *S* may be acquainted with their *Fness*” (375). Thus, the reason why the bent stick viewed at an appropriate angle is a paradigm exemplar of bentness while the stick viewed at another angle is not is that the subject can be acquainted with the stick’s bentness in the former case but not in the latter. Granting for the sake of argument that we can understand what it is to be acquainted with an object’s *Fness* without appeal to the idea that the object looks *F*, this revised account of paradigms, unlike the initial one, successfully discharges the “looks *F*” locution.

This yields the following account of *looks F*:

o looks *F* to *S* iff either:

(a) *S* is visually acquainted with o’s *Fness*, or:

(b) o has visually relevant similarities (relative to *S*’s circumstances) with actual exemplars of *F* in circumstances in which *S* may be acquainted with their *Fness*. (See Brewer 2019: 366.)

The (a)-disjunct characterizes veridical cases where o is *F* and *S* is acquainted with its *Fness*.<sup>35</sup> The (b)-disjunct characterizes illusory cases where o merely has visually relevant similarities with certain instances of *F*—namely, instances of *F* in circumstances in which the perceiver can be acquainted with their *Fness*.

Notice that Brewer’s revised account of paradigm exemplars limits the cases where a perceiver can be acquainted with an object’s *Fness* to the paradigm cases of *F* and no others. Paradigm exemplars of bentness are simply *defined* as bent objects in circumstances in which the subject can be acquainted with their bentness. There is therefore no possibility of a subject’s being acquainted with the bentness of a non-paradigm exemplar.

However, this construal of paradigm exemplars faces a problem, arising from the fact that (i) the range of paradigm exemplars of *F* must be narrow if Brewer’s account is to avoid an

implausible proliferation of looks facts and perceptual illusions. This entails that (ii) we can only be acquainted with an object's Fness in a narrow range of circumstances. But then (iii) Brewer's view rules out ordinary cases of perceptual constancy and also undermines the commonsense conception of experience that motivates naïve realism.

Starting with (i), consider a circular coin rotating in depth. Suppose the coin is slanted by a small amount—say,  $20^\circ$ —out of the frontoparallel plane, but still within the range in which shape constancy mechanisms operate successfully.<sup>36</sup> Now consider a corresponding ellipse viewed head-on that projects the same 2D shape onto the retina as the slanted circular coin. Even if the slanted coin looks in some sense “elliptical” (or at least appears to have some property that ellipses viewed head-on also appear to have), the projectively matched ellipse surely does not look circular *simpliciter*.<sup>37</sup>

Moreover, ordinary perception of the shape of a head-on ellipse is not illusory—or, if it is, it is not because the head-on ellipse looks circular. To avoid the conclusion that the head-on ellipse looks circular (and a corresponding explosion of geometrical illusions), Brewer must claim that the ellipse *lacks* visually relevant similarities with paradigm exemplars of circularity. Since it *has* visually relevant similarities with the  $20^\circ$ -slanted coin, the  $20^\circ$ -slanted coin cannot be a paradigm exemplar of circularity. This narrows the range of paradigm exemplars of circularity considerably—it cannot, for instance, include circles rotated slightly out of the frontoparallel plane.

Moving to (ii), because we can only be acquainted with the circularity of paradigm instances, the circumstances in which we can be acquainted with an object's circularity is correspondingly narrow—perhaps only when it is viewed precisely head-on.<sup>38</sup>

Now for (iii). If Brewer endorses the *prima facie* obvious claim that the head-on ellipse does not look circular, and thus opts for the view that we are not acquainted with a coin's circularity when it is slanted  $20^\circ$  out of the frontoparallel plane, then two unpalatable consequences follow.

First, many commonplace examples of perceptual constancy turn out not to be perceptual, even though it is both introspectively and empirically plausible that they are.<sup>39</sup> On the current approach, we are not acquainted with the slanted coin's circularity. And neither does it *look* circular, since this requires either that we are acquainted with its circularity or that it has visually relevant similarities with paradigm exemplars of circularity (which it does not, at least if small degrees of slant are enough to turn a paradigm circle into a non-paradigm one). How, then, do we grasp its circularity? Presumably via some judgment made on the basis of perception. But, contra Russell (1912/1998: 3), it is implausible that grasping the coin's circularity requires this sort of cognitive act.

Second, placing such a severe restriction on the scope of acquaintance spoils the naïve realist's starting point (see section 2). To switch to Russell's rectangular table (1912/1998: 3), if its shape isn't perceptible while walking around it in excellent lighting then naïve realists can no longer claim to provide “a theoretical articulation of our pretheoretical or common-sense conception of perceptual experience” (French & Phillips 2023: 364), since it is surely part of that common-sense conception that we perceive the table's shape. (No amount of observation of this sort will result in a rectangular projected shape.) Exactly how to characterize ordinary perceptual situations is then not straightforward or intuitive, as the naïve realist initially supposes.

The foregoing difficulties depend on the claim that a head-on ellipse has visually relevant similarities with a slanted circle, given that they project retinal images of the same shape. Brewer may deny it by leaning more heavily on the idea that visually relevant similarities depend on the way stimuli are “handled by the visual system.” After all, he must appeal to this in the case of

color contrast illusions, like the one discussed in section 4. A Brewer-style explanation of why the sky-blue square looks greenish-blue against a red background will need to go beyond retinal stimulation.

So let us consider this response: head-on ellipses and slanted circles are *not* handled similarly by the visual system, and this deprives them of visually relevant similarities—or perhaps deprives them of “sufficiently many” or sufficiently “appropriate” visually relevant similarities (Brewer 2011: 103 fn. 8)—notwithstanding the similarity of their 2D retinal projections.

The problem is that head-on ellipses and slanted circles *are* handled similarly by the visual system, at least at certain stages of processing. Morales et al. (2020) found that when subjects had to rapidly select which of two objects was the ellipse, responses were reliably slower when the other object was a projectively matched slanted circle than when it was a head-on circle. Processes responsible for visual search guidance, at least, seem to handle head-on ellipses and slanted circles similarly.<sup>40</sup> Retreating from the retina into the visual system will not enable Brewer to deny that head-on ellipses have visually relevant similarities with slanted circles.

Now it is true that slanted circles are not handled by the visual system in *exactly* the same way as head-on ellipses, since they look different. The representationalist will say that they look different because the circles, but not the ellipses, are *represented* as circular. Brewer cannot give this explanation, unless his account is to collapse into representationalism.

For all their ingenuity, Fish and Brewer have not succeeded in defending a naïve realist account of illusion. A declaration of victory by the representationalist would be premature, though. That will have to await the sequel to this paper.

## ENDNOTES

<sup>1</sup>This is one of a collection of four claims which Pautz calls “basic naïve realism”; he notes that “these claims are not universally accepted by naïve realists” (2021: 190).

<sup>2</sup>See also Genone 2016 on the difference between direct realism and naïve realism. Brewer, although clearly a naïve realist, does not self-identify as one: he calls his position “the object view” (2011: ch. 5) and sometimes “direct realism” (2013).

<sup>3</sup>Campbell labels his own position the “Relational View”.

<sup>4</sup>Assuming that a mere change in the external objects (swapping out one tree for its twin) will not change phenomenal character.

<sup>5</sup>For French and Phillips, the phenomenal character of experience is determined not only by *which* mind-independent elements are perceived, but also the *ways* that they are perceived. Similarly, Martin writes: “Why cannot the ways in which things are presented in experience make a difference to what the experience is like, in addition to what is presented?” (Martin 1998: 175; see also Logue 2012, Beck 2019).

<sup>6</sup>See also Fish 2009: 51–8.

<sup>7</sup>Naïve realists mostly discuss vision, and we will follow them in this.

<sup>8</sup>For discussion and references, see Martina 2023.

<sup>9</sup>For discussion see Siegel 2006, Burge 2010, Brewer 2021.

<sup>10</sup>See Quilty-Dunn 2020, Block 2023b, Green 2023a. We should note that some naïve realists accept that representations are produced in sub-personal perceptual processing (e.g. French & Phillips 2023).

<sup>11</sup>For the former, see, e.g., Quilty-Dunn and Green 2021; for the latter, see Burge 2022: ch. 6.

<sup>12</sup>Representationalists who take the contents of perception to be singular (object-dependent) may also claim to accommodate the idea that the phenomenal character of experience is partly constituted by the mind-independent objects we perceive (Fish 2009: 17; French and Phillips 2023: 364 fn. 4).

<sup>13</sup>Some think that perception obeys constraints that belief does not. For example, while a confused person might believe that a surface has two incompatible colors, allegedly no one can perceptually experience a surface as being this way (Pautz 2020). Perhaps this could be leveraged into an argument for naïve realism, but we will not investigate it here.

- <sup>14</sup> For a defense of naïve realism that invokes a representationalist account of sensory imagination, see Martin 2002.
- <sup>15</sup> Naïve realists arguably have a more difficult problem with hallucination than representationalists (e.g., Beck 2023). For an account of hallucination that assimilates it to illusion, and so to that extent is naïve-realist-friendly, see Byrne and Manzotti 2022.
- <sup>16</sup> Here are four examples from the literature, which flesh out the suspicion in different ways. Fish (2009: 22-23) contends that naïve realism, but not representationalism, accommodates the allegedly attractive idea that in ordinary perception we are immediately presented with particular property instances, not just general properties: “[W]hen we see an object—such as the Pacific Ocean or the Taj Mahal—it is not simply blueness or pinkness that we are aware of, but specific *instances* of blueness and pinkness: the blueness of the *Pacific Ocean* and the pinkness of the *Taj Mahal*” (23). Somewhat similarly, Heather Logue claims that “Naïve Realism is the only view that can hold that the phenomenal character of a veridical experience of an instance of *F*-ness has that instance of *F*-ness as a constituent” (2012: 32), and argues that as a consequence, only naïve realism explains how we are “in a position to know what *F* things are like independently of experience” (233). Third, Michael Martin takes naïve realism, not representationalism, to be “the best articulation of how our experiences strike us as being to introspective reflection on them” (2004: 42). Finally, Brewer motivates naïve realism by appealing to the “early modern empiricist insight” that ordinary perceptual experience is “most fundamentally to be construed in terms of a relation of acquaintance with certain direct objects, whose identity and nature provide the most basic elucidation of what it is to be in the relevant conscious experiential condition” (2011: 12), and argues that representationalists cannot accommodate this insight (56).
- <sup>17</sup> Compare Genone 2014: “The relational view is committed to denying that perceptual error is so much as possible” (361). One complication we can ignore is the possibility of a *representational* version of naïve realism, on which all perceptual representation is veridical (Logue 2014; see also Langsam 2017: 119-20 n. 11). Our representational rival to naïve realism admits the possibility of perceptual error.
- <sup>18</sup> For a discussion of perception and perceptual verbs, see Brogaard et al. *Forthcoming*. For independent concerns with orthodox characterizations of illusion such as Smith’s, see Macpherson and Batty 2016.
- <sup>19</sup> We pass over certain complications here. First, some have argued that representation in visual experience may come apart from representation by the visual system (see Siegel in Siegel and Byrne 2016). Second, there may be unconscious representations within the visual system (e.g., in the dorsal stream) that do not contribute to how objects look. Third, sometimes an object may illusorily look *F* even though the visual system does not represent it as *F*, but only as some determinate of *F*. For example, an object might illusorily look red in virtue of the visual system’s misrepresenting it as scarlet.
- <sup>20</sup> For discussion of these indicators, see Block 2023a: ch. 2.
- <sup>21</sup> See Busch and Müller 2004a.
- <sup>22</sup> See Rosa Salva et al. 2013 on chicks (mentioned in Block 2019) and Sovrano et al. 2015 on fish. Some studies have, however, reported a *reversed* Ebbinghaus illusion in chicks, where the circle surrounded by larger circles appears larger than its counterpart (Nakamura et al. 2014).
- <sup>23</sup> Fish argues that illusions must have phenomenal character because the phenomenal character of veridical perception can be partially determined by the phenomenal character of illusory perception—e.g., when an object’s shape is perceived accurately but its color is misperceived (2009: 44; see also Smith 2010: 388-90; Millar 2015: 610-13).
- <sup>24</sup> Fish maintains that internal factors like attention can affect the character of a subject’s experience only by selecting which facts the subject is acquainted with (2009: ch. 3).
- <sup>25</sup> The half-submerged-stick illusion is often called an “optical illusion,” while the Müller-Lyer and Ebbinghaus illusions are usually called “visual” or “perceptual” illusions (Gregory 1968: 279, McLaughlin 2016: 233). While we adopt this standard terminology, note that Fish calls the half-submerged-stick a “physical” illusion and the latter two “optical” illusions. Genone classifies optical and perceptual illusions (in standard terminology) together as “environmental” illusions (2014: 360).

Individual variation in (say) color perception might be thought to produce another kind of illusion: if you see a chip as bluish green and I see it as yellowish green (in the same lighting conditions), presumably at least one of us is not seeing the chip veridically. Since representationalists often resist the idea that one of us is suffering from an illusion (e.g. Cohen 2009), we will ignore individual variation here (for discussion see Byrne and Hilbert 2017). Genone also has a category of “physiological” illusions, where the perceiver’s visual system is malfunctioning “under the influence of drugs or sleep deprivation” and the like (2014: 360). These too will be ignored.



- <sup>26</sup>See Fish 2009: 165–72. Genone 2014 uses the same terminology for the same phenomenon (360).
- <sup>27</sup>The question of why the half-submerged stick looks bent is different from the question of why we fail to see its straightness. Fish answers the latter question by suggesting that “the distorting action of the water alters the array of facts we can see by precluding us from seeing some facts [i.e., the fact that the stick is straight] and enabling us to see others” (2009: 165).
- <sup>28</sup>Likewise, Genone attempts to account for standard color illusions by suggesting that we are not acquainted with the intrinsic colors of objects, but rather with fine-grained “appearance properties,” characterized as “properties objects have in virtue of their intrinsic properties relative to the environmental conditions” (2014: 365), such as lighting or the surrounding context (362).
- <sup>29</sup>Compare Noë’s notion of *P-shape*, defined as “the shape of the patch needed to occlude the object on a plane perpendicular to the line of sight” (Noë 2004: 83). Fish (2009: 160–161) suggests that perceptual experience acquaints us with P-shape, or something of this sort. However, the P-shape view faces various objections (see Briscoe 2008; Green and Schellenberg 2018: 8–9). For example, when subjects are asked to choose which of a set of head-on ellipses best matches the “apparent shape” of a slanted disc, they generally do not pick the projectively matched ellipse, but one whose aspect ratio lies between that of the disc’s intrinsic shape and that of its retinal projection (Thouless 1931). Alternatively, Fish could turn to other viewpoint-dependent relational properties to explain shape appearance (e.g., Hill 2022: 42–49).
- <sup>30</sup>Similarly, a heron stalking a fish is not primarily interested in the “apparent depth” of the fish, but in its actual depth, which differs from its apparent depth due to refraction. Some herons have been demonstrated to correct for refraction when striking (Katzir and Intrator 1987); the simplest hypothesis is that they are able to compensate for the visual misperception of depth, not that they veridically perceive apparent depth when looking into water, and veridically perceive actual depth when looking entirely through air.
- <sup>31</sup>For discussion of points related to the last two paragraphs see Byrne and Hilbert 2017.
- <sup>32</sup>See Feng et al. 2017 for a review of the Müller-Lyer illusion in animals, and Busch and Müller 2004 and Proulx and Green 2011 for evidence that the illusion influences pop-out.
- <sup>33</sup>Brewer draws a distinction between “thinly” looking F and “thickly” looking F, with the latter requiring more than the former (2011: 121–2). The analysis in the text is of “thin” looks, which is the relevant kind for our purposes.
- <sup>34</sup>See Byrne 2021.
- <sup>35</sup>Clearly some non-obvious metaphysics of property instances is needed here, since if o’s Fness is simply Fness, then being acquainted with o’s Fness (together with being acquainted with o itself) is not sufficient for o’s looking F. But we will not pursue this issue.
- <sup>36</sup>See Epstein et al. 1977; Howard et al. 2014.
- <sup>37</sup>One might suggest that the head-on ellipse looks, in some sense, circular-and-at-a-slant; even if so, this is not the same thing as looking circular *simpliciter*. Likewise, as Brewer himself observes, a piece of red chalk in normal light might be claimed to look white-in-red-light, but it surely does not look white *simpliciter* (2011: 125).
- <sup>38</sup>Brewer clearly wants to say that we *are* acquainted with the coin’s circularity across a variety of slants. For instance, he writes: “[W]e may be acquainted with certain objective properties—the circularity of a coin, say, from (changing) points of view from which the coin in question has visually relevant similarities with paradigm exemplars of incompatible shape properties. . . . But none of this is in any tension with, and indeed depends upon, the fact that the perceiver is acquainted with the coin and its circular shape; and indeed it also looks circular even when viewed at 45° to straight ahead” (Brewer et al. 2018: 23).
- <sup>39</sup>See Epstein et al. 1977, Briscoe 2008, Hopp 2013, Howard et al. 2014, Green 2023b.
- <sup>40</sup>Burge and Burge 2022 raise objections to this study’s methodology, but see Morales and Firestone 2023 for a persuasive reply. For our purposes, it doesn’t matter whether the similarities in the visual system’s handling of slanted circles and head-on ellipses are consciously manifest or confined to subpersonal visual processing (Henke and Weksler *Forthcoming*).

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