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EVEN ZOMBIES CAN BE SURPRISED: A REPLY TO
GRAHAM AND HORGAN

ABSTRACT. In their paper “Mary, Mary, Quite Contrary” (2000), George Graham and Terence Horgan argue, contrary to a widespread view, that the so-called Knowledge Argument may after all pose a problem for certain materialist accounts of perceptual experience. I propose a reply to Graham and Horgan on the materialist’s behalf, making use of a distinction between *knowing what it’s like to see something F* and *knowing how F things look*.

In their paper “Mary, Mary, Quite Contrary” (2000), George Graham and Terence Horgan raise a problem for materialist theories of mind. They argue, contrary to a widespread view, that the so-called Knowledge Argument may after all show that materialist theories fail to account adequately for the phenomenal character of conscious experience. Graham and Horgan’s case is ironic, since both are materialists; in spite of themselves they have revived the Knowledge Argument by giving it an interesting new twist. At the least, their argument demands a new response from the materialist, and my project here is to make a start in that direction. The crux of my response will be a refutation of the Knowledge Argument that turns on the difference between knowing how F things look and knowing what it’s like to see F things. I should say right away that the present discussion will be somewhat long on citation and exegesis. I have tried to keep this to a minimum, but given my goal, a certain amount of textual evidence will be essential.

In Frank Jackson’s Knowledge Argument, you will recall, Mary is omniscient with respect to the physical universe: she knows “*everything* there is to know about the physical nature of the world. She knows all the physical facts about us and our environment, in a wide sense of ‘physical’ which includes everything in *completed* physics, chemistry, and neurophysiology, and all there is to know about the causal and relational facts consequent upon all this, including of course functional roles” (1986, p. 291). However, Mary

is confined to a black and white room, never allowed to see the colors of things. Jackson asks: what will happen when Mary is released from the room, when finally she sees, say, ripe tomatoes? Plainly she will learn something new “about the world and our visual experience of it”, he claims (*loc. cit.*, p. 292). In particular, Mary will learn a new fact about the experience of seeing red: she will learn *what that experience is like*, will gain knowledge of its phenomenal character. Hence physicalism (materialism), the view that all facts are physical facts, is false.

As has often been noted, Jackson’s thought-experiment must be refined to rule out the possibility that Mary imagines red, or visualizes it in a dream, or experiences it in an afterimage, prior to her release. Graham and Horgan write: “[we must suppose that] she has been completely monochromatic from birth and that her ability to see afterimages in color has atrophied. . . . [Also, that] she is released from her room, while unconscious, and then undergoes a medical procedure which permits her to see colors” (2000, pp. 61–62).¹ The idea is that before her medical procedure, Mary would be unable to see red even if she were confronted with a ripe tomato. In what follows, I will characterize the relevant difference between Mary’s pre-release (pre-operative) and post-release (post-operative) mental states by saying that only after the procedure is she able to form visual representations of red.² (I will say more about the nature of visual representations as we go along.) Nothing essential to my view depends upon this way of describing the difference, but as we will see, it fits well with the terms in which Graham and Horgan frame their discussion.

The standard (though not the only) materialist response to the Knowledge Argument has been to say that while Mary does learn something new upon her release, her new knowledge is fully explicable within a materialist framework.³ Rather than learning a new, nonphysical fact about color experience, Mary learns an old, physical fact *in a new way*, or *under a new concept* or *mode of presentation*. This standard response is the principal target of Graham and Horgan’s paper. They take as their exemplar Michael Tye’s representational theory of perceptual experience, so we’ll need to acquaint ourselves with the relevant features of Tye’s view. He writes:

To undergo a state with a certain felt or phenomenal quality is to be the subject of a state that represents a certain external quality (by being appropriately causally connected with it in optimal conditions) and that is poised for use in the formation of beliefs and/or desires. . . . [T]he phenomenal character of any given internal state consists in its being *a* state that is appropriately causally connected to external items and that is appropriately poised. So what it is like to undergo a given state is a broadly physical, second-order property of that state (1995, pp. 162–163).⁴

According to Tye, phenomenal character is a type of intentional content – what he calls the ‘PANIC’ of a state:

Phenomenal content, I maintain, is content that is appropriately poised for use by the cognitive system, content that is abstract and nonconceptual. I call this the PANIC theory of phenomenal character: phenomenal character is one and the same as Poised Abstract Nonconceptual Intentional Content (p. 137).

For present purposes the important point is this. On Tye’s view, when Mary is released from the black and white room and finally sees the red tomatoes, she comes to know an old, broadly physical fact about human color experience in a new way – *viz.*, by introspection. The old fact, I take it, is something like *the fact that a visual experience of red is a state that causally co-varies under optimal conditions with such-and-such triple of wavelength reflectances and is appropriately poised to figure in cognition*. The new way of knowing involves applying *phenomenal concepts* from a first-person or subjective perspective. Tye explains:

Phenomenal concepts are the concepts that are utilized when a person introspects his phenomenal state and forms a conception of what it is like for him at that time. . . . Some of [these concepts] are indexical; others are predicative. . . . Suppose, for example, I am having a visual experience of [the shade] red₂₉. I have no concept *red*₂₉. So, how do I conceptualize my experience when I introspect it? . . . I conceptualize it as an experience of *this* shade of red. I bring to bear the phenomenal concepts *shade of red*, and *this* (pp. 166–167). . . . [W]ithout the application of phenomenal concepts . . . we are *oblivious* of our experiences. There is something it is like for each of us to undergo any experience, but we need not always be aware of what it is like . . . (pp. 168–169).

Intuitively, possessing the [predicative] phenomenal concept *red* requires that one have experienced red and that one have acquired the ability to tell, in the appropriate circumstances, which things are red directly on the basis of one’s experiences. . . . These claims lay down conditions that are constitutive of possession of the . . . concept [*red*]. . . . What about the phenomenal indexical concept *this*? Possessing this concept is a matter of having available a way of singling

out, or mentally pointing to, particular features that are represented in sensory experiences *while* they are present in the experiences, without thereby describing those features (*in foro interno*) (p. 167).⁵

On Tye's view, the phenomenal character of a state, what it is like to undergo it, is an objective physical property that is known in introspection from a subjective perspective or point of view. As Tye will put it, when Mary finally lays eyes on (e.g.) a red₂₉ object, she learns a new fine-grained fact about human color experience – *viz.*, the fact that an experience of red₂₉ is an experience of *this* shade of red – but no new coarse-grained FACT. Hence physicalism is untouched.

Graham and Horgan (hereafter, G&H) are not convinced. They think that Tye has failed to consider the implications of certain metaphysical views Mary might hold – in particular, metaphysical views that would seem to make inexplicable her presumptive surprise and delight at her new experience of colors. The difficulty is revealed by way of a new character, Mary's daughter Mary Mary. Mary Mary is physicalistically omniscient but in addition has mastered, and fully endorses, Tye's PANIC theory. She knows all about phenomenal concepts, causal co-variational theories of content, fine-grained facts, and the rest. G&H ask: what if anything will Mary Mary learn upon her release from the black and white room, and in particular is it rational for her to be surprised by her new experience and/or knowledge? They characterize Mary Mary's pre-release situation as follows:

When Mary Mary contemplates a post-monochromatic mental life for herself, what changes can she reasonably expect? She expects to undergo certain visually generated PANIC states she has never undergone before. Since she thoroughly understands the functional-representational role of these states, she expects them to play such a role in herself. In particular, she expects to acquire, on the basis of these PANIC states, certain new discriminatory and recognitional capacities vis-à-vis physical colors – those very capacities which, according to Tye's theory, constitute the possession of the relevant phenomenal concepts. She expects to have new beliefs and new knowledge-states that employ these capacity-based concepts – including “knowing what it's like” states, in which the newly-tokened PANIC properties themselves are represented under the newly acquired phenomenal concepts (p. 14).

Given this antecedent knowledge, what remains for Mary Mary to be surprised about upon her release, as surely she will be? G&H ask:

Should Mary Mary, while still in her monochromatic situation . . . expect unanticipated *delight* at the new experiences and new knowledge, over and above any anticipated delight that she might expect to arise purely from the acquisition of new discriminatory and recognitional capacities *per se*? No, she should not. For, given Tye's theory, essentially all she is missing is those discriminatory/recognitional capacities *themselves*; and she thoroughly understands these already, even though she does not currently possess them (*ibid.*).

I take it Mary Mary is simply a device for making explicit certain elements of Mary's pre-release epistemic state, on the assumption that Tye's theory is true. (Jackson could not object to the idea that Mary knows Tye's theory.) From now on, then, I will revert to talking simply about Mary, thus clarified.

G&H are urging that once the extent of Mary's pre-release knowledge of color, color experience, and introspection are properly appreciated, it becomes difficult to see why, on Tye's view, she should be surprised by her new experience and/or knowledge. Tye attributes Mary's surprise to the conceptual independence of her (new) phenomenal and (old) PANIC-theoretical concepts:

The concepts [she applies] in the two cases are very different. In the one case, the concepts are purely phenomenal; in the other, they are not. The fact [she knows] via introspection is, therefore, very different from the fact [she knows via reading about the PANIC of her experience]. The one is not deducible from the other. . . . So *of course* it is amazing. . . . The concepts are irreducibly different (pp. 178–179).

But the trouble is that Mary already knows about that conceptual difference, so nothing is left to surprise her: “given the materialist story about phenomenal consciousness that she initially accepts, she has no apparent rational basis for such a post-release reaction” (G&H, p. 2). G&H conclude that Mary must be surprised by some feature of her new color experience not encompassed by physicalist theory; and so the challenge to the materialist is reinstated.

What will surprise and delight [Mary is] the unanticipated *experiential basis* of her concept-wielding, recognitional/discriminatory, capacities, and the acknowledged richness of her experience; she never expected polychromatic experience to be like *this*. It will seem to her that this surprising, and unexpectedly delightful, aspect of her experience is both (i) distinct from the recognitional/discriminatory capacities for which it is the experiential basis, and (ii) something that has a quite distinctive character *qua* mental, over and above the representational/functional PANIC role that she knows about already. . . . So Tye's theory should now

strike [Mary] as quite mistaken, precisely because it apparently leaves out this distinctive, and distinctively mental, character of her visual experience. . . . [Mary] also should conclude that Tye was wrong in claiming that possession of phenomenal *concepts* consists merely in certain recognitional/discriminatory capacities. Although such capacities may well be *part of* what constitutes the possession of phenomenal concepts, they are not the whole. There is also the direct acquaintance with phenomenal character itself, acquaintance that provides the experiential basis for those recognitional/discriminatory capacities (pp. 16–17).

In what follows I am going to recommend a reading of Tye that differs slightly from G&H's, and indeed differs at least in emphasis from the one Tye himself seems to intend. I will then suggest that this adjusted reading opens up a plausible line of response to G&H.

Let me begin by saying I agree with G&H that, on Tye's view as it stands, there is nothing in Mary's new introspective knowledge, as such, to surprise her. My reasons for thinking this are somewhat different from theirs, however. As we have seen, G&H's criticism relies on ascribing to Tye the view that possession of phenomenal concepts like RED and THIS SHADE OF RED consists in having certain discriminatory and recognitional capacities:

[P]henomenal concepts . . . are constituted by the relevant discriminatory/recognitional capacities vis-à-vis red things, vis-à-vis the physical property of redness, and (in the case of introspective application), vis-à-vis redness-representing PANIC states themselves (p. 15)

Though strictly speaking correct, this way of characterizing Tye's view tends to make us overlook a crucial feature of Mary's pre-release epistemic situation. Specifically, it underemphasizes the fact that phenomenal concepts are mental representations. Let me explain why this is important.

First we need to get clear what sort of representations phenomenal concepts are. Specifically, what does it mean to say that they are *phenomenal*? As I understand Tye, these are concepts that apply to external features, like reflectance triples, in virtue of how those features *seem*, perceptually speaking – in other words, how they look, or sound, or feel. The phenomenal concept RED, for example, secures its application at least in part by dint of its causal relationship to the perceptual experience of red (*viz.*, the PANIC state that visually represents the color). Tye writes:

[P]ossessing the phenomenal concept *red* requires that one have experienced red and that one have acquired the ability to tell . . . which things are red directly on the basis of one's experiences. . . . [P]ossession consists (very roughly) in having available a state that has a causal history that links it with the relevant experiences and that enables its possessor to make the relevant [identifications] (p. 167).

Among concepts, the phenomenal ones are the perceptual ones: we might say that they are classifying perceptual representations. They classify external features according to how those features look, sound, feel, etc.

With this picture of phenomenal concepts in mind, let me suggest a way of thinking about introspection that differs from what Tye actually says on the matter but is, I think, consistent with his view.

Consider an organism that is functionally similar to us humans – among other things, it has PANIC states (experiences) that visually represent shades of red – except that it cannot introspect. Tye acknowledges that phenomenally conscious perceptual experience often occurs, in nonhumans and humans alike, in the absence of introspection or even of the ability to introspect (pp. 5–6). It is a nice question just how such an organism would differ, in general, from one that introspects; but I think we can abstract from the details here without getting into trouble. In particular, there is no obvious obstacle to supposing that such a nonintrospecting organism could learn to recognize instances of red on sight, therein acquiring a predicative phenomenal concept RED; and that it could learn to discriminate among shades of red on sight, therein acquiring the phenomenal concept SHADE OF RED. Presumably it could also master the indexical concept THIS, and could learn to apply to any shade of red it sees, the phenomenal concept THIS SHADE OF RED. Introspection does not seem needed to do any of these things.

The question is: what else would such an organism need to be able to do, according to Tye, in order to introspect upon the phenomenal character of its color experiences? Tye doesn't say a great deal about how introspection works – why or how we “turn our attention inward”, as he puts it – but as far as awareness of phenomenal character is concerned, introspection appears to consist simply in attaching a conceptual operator such as EXPERIENCE OF X, or X IS WHAT IT IS LIKE TO SEE RED THINGS, to the phenomenal concepts THIS, RED, and SHADE OF RED. Tye

asks: “How do I conceptualize my experience when I introspect it? I conceptualize it as an experience of *this* shade of red” (p. 167). To this extent, introspection is parasitic upon perception; or perhaps better, introspective knowledge is parasitic upon perceptual knowledge. Intuitively speaking, there are no *phenomenal* concepts special to introspection; in its use of phenomenal concepts, introspection piggybacks on perception. G&H capture the parasitic nature of introspection perfectly when they say that on Tye’s view, “One thinks to oneself, ‘Ah, *red* is what it is like to see red things’ ” (p. 10).

My present point is that, as I am reading Tye, introspection *per se*, namely “higher order consciousness” as distinct from perception or “phenomenal consciousness”, is a largely *nonphenomenal conceptual* affair: it seems to consist primarily in attaching a nonphenomenal conceptual operator, such as EXPERIENCE OF X, to the phenomenal concepts whose possession constitutes perceptual knowledge. Indeed, Tye often refers to introspection as a form of cognition (p. 115), as opposed to sensation or perception, or as a form of thought or reflection directed on other mental states (p. 5). I emphasize this point because I think it reveals an important fact about Mary. These nonphenomenal conceptual operators are something that Mary would know about before her release, if she knows Tye’s PANIC theory; she would already know *inter alia* that after her release she will attach these operators to her phenomenal concepts when she introspects. This makes it hard to see what should surprise her in introspection, in higher order consciousness, *per se*.

This reading of Tye on introspection differs from the one that G&H offer, though perhaps something like it motivates them. Be that as it may, they conclude that Mary must in fact be surprised by the “distinctively mental character of her visual experience” – something omitted from the physicalist story. As I said earlier, I am not yet convinced of this conclusion. I want to suggest that Tye has the resources to explain Mary’s surprise in a less materialistically noxious way.

Thus far I have been somewhat unfair to Tye, because I wanted to lay some groundwork for what follows. I’ve been unfair in failing to note that, on his view, Mary’s post-operative new knowledge derives from the phenomenal concepts that she applies when she introspects; in other words, what is supposed to explain her surprise is

her new application of the phenomenal concepts THIS and SHADE OF RED, not *merely* the attachment of what I've called non-phenomenal conceptual operators like EXPERIENCE OF X. As I observed a moment ago, in its use of phenomenal concepts, introspection piggybacks on perception. That fact makes itself felt again here. Even when we use them in introspection, phenomenal concepts apply to external properties, like shades of red; and their application is, in the ways discussed earlier, grounded in perception. Thus even if Mary's new knowledge derives from introspection as Tye claims, the elements of her introspective states that afford her new knowledge are fundamentally perceptual representations; their possession constitutes her perceptual knowledge of distal properties. In this connection we see clearly Tye's externalism regarding phenomenal character. He writes:

These [phenomenal] concepts [SHADE OF RED and THIS] are the same ones I bring to bear when I notice the shade of red alone without attending to the fact that I am experiencing it – as, for example, when I am not introspecting but simply looking hard at the color of a red₂₉ object. This is why when I turn my attention inward to the experience itself, I always seem to end up scrutinizing external features. *The phenomenal concepts I apply and the features to which I apply them are the same in both the perceptual and the introspective cases . . .* (p. 167). When we introspect our visual experiences . . . what we are aware of are the features our experiences represent external items as having (p. 163; emphasis added).

What I want to suggest, then, on my adjusted reading of Tye, is that we view Mary's new knowledge as deriving almost entirely from her new perceptual representations – her perceptual experiences (PANIC states) and consequent perceptual knowledge (phenomenal concepts) – of red things. That is to say, we ought to view her new knowledge as deriving not from introspection or higher order consciousness, but from perception or phenomenal consciousness. I will say that the primary object of Mary's learning is not *what it's like to see red*, but rather *how red things look*.⁶ Learning how red things look consists in forming certain visual representations of red; specifically, it consists in newly forming a phenomenal concept of red as a result of newly undergoing red-representing PANIC states.⁷ Mary learns how red things look whether or not she introspects. If she does introspect, she also learns *what it's like to see red*, but only in the parasitic fashion I described

before. *How red things look* is learned by perceiving; *what it's like to see (look at) red* is learned by introspecting.

Typically in discussions of qualia, learning or knowing *what it's like to see something F* and learning or knowing *how F things look* are equated. For example, in discussing a patient with unilateral visual neglect, Tye writes:

Does the house with the flames on the left *look* any different to her than the normal house? Is there any difference in what it is like for her as she views the two houses? (p. 8).

Elaborating a thought-experiment about Fred, who sees two different colors within the range we call 'red', Jackson says this:

Fred . . . explains that all ripe tomatoes do not look the same color to him. . . . What kind of experience does Fred have when he sees red₁ and red₂? What is the new color or colors like? . . . [If Fred's visual system is transplanted into us, then] we will know what it is like to see the extra color . . . (1982/1990, pp. 441–442).

It seems to me, however, that we should distinguish between (e.g.) *what it's like to see red* and *how red things look*, especially if we think, as Tye does, that one can experience the colors of things without knowing what it's like to experience them – that is, without either introspecting upon one's experience or having theoretical knowledge of its PANIC. I submit that there is a robust sense in which any organism that visually represents red and can recognize red things by *looking* at them knows how red things *look*; and any organism that visually represents red₂₉ and can discriminate red₂₉ from other shades of red by *looking* at them knows how red₂₉ things *look* – whether or not it is capable of introspection.⁸ (Suppose we are choosing the color for a new rug. If I ask 'Do you know how vermilion looks?', or even 'Do you know what vermilion looks like?', I am not inquiring about the phenomenal character of your experience.)

In Tye's terms, any organism that can properly apply the phenomenal concept RED to red things, and the phenomenal concept THIS SHADE OF RED to red₂₉ things (among others), knows how red things look and how red₂₉ things look. Or at least if more is required (certain linguistic capacities?), it isn't more of anything that should worry a materialist, i.e., more in the way of intrinsic qualia or other "distinctively mental aspects".

This is one way of understanding where the Knowledge Argument goes wrong. The trouble with the thought-experiment about Mary is that, whether or not she acquires knowledge of qualia upon her release, she does acquire substantive perceptual knowledge of how red things look: she forms new, perceptual representations of red. Consider now Mary's sister, the phenomenally challenged Zombie Mary, who is functionally identical to Mary but (so the story goes) bereft of qualia. Zombie Mary would form the same new perceptual representations upon her release from the achromatic room: she too would learn how red things look. Lest there be any doubt, compare a second sister, Colorblind Mary, a functional duplicate of Mary and Zombie Mary who does not undergo the corrective medical procedure that would enable her to see colors. Surely, upon their release, Zombie Mary will learn more than Colorblind Mary does; among other things, she will learn how red things look. If this is right, then the claim that Mary learns something new does not by itself serve to distinguish her epistemic situation from that of a zombie. And so the thought-experiment fails to show that Mary learns anything about (nonphysical) qualia.

That said, does my adjusted reading of Tye help to address G&H's concern about the rationality of Mary's (*eo ipso* Zombie Mary's) surprise? Given that she learns how red things look, does her reaction make sense? We may be nearing intuitive bedrock here, or anyway nearing a dispute over the proper analysis of surprise: when is it rational to be surprised? But the following simple argument seems to me worthy of consideration:

- (1) It is rational to be surprised when one learns something of a nontrivial sort.
- (2) Upon her release, Mary learns how red things look.
- (3) Learning how red things look is learning something of a nontrivial sort.
- (4) Therefore it is rational for Mary to be surprised.

I say that Mary's learning is nontrivial for at least three reasons. First, again, learning how red things look consists in forming certain mental representations. In particular, if acquiring a (recognition/ discriminatory) *capacity* does not involve forming a new representation, then learning how red things look does not consist merely in acquiring a new capacity. Second, before her release

and medical procedure, Mary is unable to form the representations in question; so they, and the knowledge they afford her, are genuinely new. Third, these representations are fundamentally *perceptual* representations: they are perceptual experiences (PANIC states) and perceptual, i.e., phenomenal, concepts. Thus they make available new perceptual modes of presentation of a physical property (a certain reflectance triple, according to Tye) of which Mary already has exhaustive physical-theoretical knowledge. Knowing red under perceptual modes of presentation – knowing how red things look – seems nontrivially different from knowing it under a physical-theoretical mode of presentation. Recall Tye’s explanation for Mary’s surprise: “[t]he fact [she knows] via introspection is . . . very different from the fact [she knows via reading about the PANIC of her experience]” (pp. 178–179). I am proposing, in contrast, that she is surprised because the fact she knows via *perception* is very different from the fact she knows via reading about the physical-theoretical nature of colors.

Still, G&H may ask: *what* is Mary surprised about? Since she already knows everything physical, in particular already knows that she will newly form the relevant perceptual representations of red, doesn’t her surprise indicate that some thing or property (the “look” of red?) is missing from the physicalist story? Here I would suggest that we may be misled by the surface grammar of our language. For example, one might equally have asked ‘*Why* is Mary surprised?’ And a satisfactory answer would have been: ‘Because she has just learned how red things look’. For that matter, a satisfactory answer to the question ‘*What* is Mary surprised about?’ might be: ‘How red things look’. Ordinary speech seems to allow any of the following: she is surprised *about* how red things look, or *at* how red things look, or *by* how red things look. I have argued that learning how red things look consists in forming new perceptual representations; until Mary forms those representations, she doesn’t know how red things look. So it is rational for her to be surprised. To insist now that there must be some additional thing or property that is the object of Mary’s surprise would beg the question against the materialist.⁹

NOTES

- ¹ All further citations from Graham and Horgan will be from their 2000.
- ² My terminology of ‘forming’ a mental representation is meant to remain neutral, insofar as is possible, on the question whether knowing what it’s like to see red involves merely *possessing* a visual representation of red or, alternatively, (possessing and) being able to *undergo the activation of* such a representation. I am not certain of the answer, but as far as I can see, my response to Graham and Horgan could be adjusted to accommodate either verdict.
- ³ Some materialists argue that Mary learns nothing new upon her release (see e.g. Dennett 1991, Churchland 1989). Like Graham and Horgan I won’t discuss views of this kind here, but it will be implicit in my discussion that a materialist *needn’t* deny that Mary learns and will be surprised.
- ⁴ All further citations from Tye will be from his 1995.
- ⁵ Tye is correct, I think, in supposing that we have no concept *red*₂₉. This is because our hue memory is insufficiently fine-grained to permit us to remember a determinate shade; see my 1995 for some details.
- ⁶ I thank Alex Byrne for discussion of the best way to formulate this distinction.
- ⁷ See again note 2.
- ⁸ Given the limited nature of hue memory (*cf.* note 5), one might dispute the idea that we can *know* how *red*₂₉ things look. But this would be on grounds unrelated to our discussion here. See my 1993, pp.89-90 for some discussion.
- ⁹ I am grateful to Terry Horgan for many helpful comments.

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