Rainbow's End: The Structure, Character, and Content of Conscious Experience[1]

Abstract:

There are three main positions regarding the relationship between phenomenality and intentionality: separatism, representationalism, and phenomenal intentionalism. I defend a novel claim about the phenomenal-intentional relation that is incompatible with separatism, can enrich representationalism and phenomenal intentionalism, but can also be accepted without endorsing representationalism or phenomenal intentionalism. I call this view phenomenal schematics: Phenomenal structure places formal and sometimes semantic constraints on the possible intentional contents of our experiences, and these constraints hold with apriori necessity. According to phenomenal schematics, the phenomenal structure of our experiences is akin to the grammatical properties of words (or the rules of composition governing the representational elements in diagrams, maps, and models). Unlike words, however, phenomenal characters possess their "grammatical properties" essentially. This is a point that has not received clear expression in the literature to date, and it marks a new perspective on the connections that exist between phenomenality and intentionality.

Key Words: Phenomenal consciousness, Phenomenal structure, Syntactic structure, Separatism, Representationalism, Phenomenal intentionality, Phenomenal schematics

1. Introduction

Consider the difference between pressure experiences and temperature experiences. What it is like to feel a pressure has two components: one corresponding to the degree of force and the other to the direction of force. If you press your left index finger straight down into the palm of your right hand, and then at a 45º angle, you can match the two experiences in terms of the degree of force while each differs in the direction of force. To formally model the phenomenal character of our experiences of pressure, we would need to use a vector (or a vector gradient).[2] Temperature experiences, on the other hand, have no second component to them. We can be more or less hot or cold, cool or warm. There is nothing analogous to a direction of

[1] A revised edition of this paper is forthcoming in *Mind & Language*.

[2] By 'phenomenal character' I mean the qualitative aspects of our experiences, what it is like to have them.

force component. To formally model our temperature experiences, we would need to use a magnitude (or a magnitude gradient).

I shall argue that structural features of the phenomenal characters of our experiences, like the ones mentioned above, place formal and in some cases semantic constraints upon the possible intentional contents that our experiences can have, and these constraints hold with apriori necessity. I call this view *phenomenal schematics*.[3] For instance, consider the phenomenal character of our experiences of warmth, *p-warmth*. I shall argue that the structure of p-warmth rules out the possibility that it could have served to represent a pressure; p-warmth lacks a second component that could serve as a means of representing a direction of force. Not all possible contents besides *warmth* will be ruled out by the phenomenal structure of p-warmth, however; phenomenal schematics is compatible with (though it does not entail) the claim that p-warmth could have represented coolness instead of warmth.

Phenomenal schematics differs in significant respects from the three main views in the literature on the relationship between phenomenality and intentionality: separatism, representationalism, and phenomenal intentionalism.[4] It marks an overlooked node in dialectical space (see figure 1).

Separatism claims that phenomenality and intentionality are only contingently related. As David Papineau says while defending the view, separatism claims that phenomenal characters, "in themselves are like typographical words, items that have no constitutive tie to what they contingently represent." (2016: 343). Separatism was the default position in analytic

[3] I shall remain neutral on whether these constraints are metaphysically necessary in addition to being apriori, or whether their apriori status is due to metaphysically contingent features of our cognitive architecture. Even if the latter obtains, the constraints identified below will plausibly hold for all (non-pathological) human experience (see fn. 12).

[4] Disjunctivists and naïve realists deny that our experiences have representational contents. I shall not discuss these views in this paper, since my arguments are intended to address realists about the representational contents of experience.

philosophy of mind until the 1980s (see Lycan, 2008: §9; Siewert, 2016: §5). And, while relatively few philosophers explicitly defend the view today—Jaegwon Kim (2005) is widely interpreted as a separatist, and David Papineau (2014; 2016) is the view's most recent advocate—separatism remains a popular view. Papineau even claims that separatism is, "little more than common sense" (2014: 2).

Representationalism claims that phenomenality is identical to, reducible to, or grounded in a kind of intentional content (Dretske, 1996; Byrne and Tye, 2006; Chalmers, 2004; 2007; Lycan, 2001). In short, there is a kind of intentionality that suffices for phenomenality with metaphysical necessity.

Phenomenal intentionalism claims that there is a kind of intentionality—call it *phenomenal intentionality*—that is identical to, reducible to, or grounded in phenomenality (Georgalis, 2006; Kriegel, 2011; Loar, 2003; McGinn, 1988; Searle, 1992; Strawson, 2008; Horgan and Tienson, 2002). In short, phenomenality suffices for a kind of intentionality with metaphysical necessity.

We can identify the above positions by their answers to three questions:

> (1) Are there any apriori or metaphysically necessary constraints between the phenomenal characters and intentional contents of our mental states?

Separatism answers (1) in the negative; phenomenal schematics, representationalism and phenomenal intentionalism all answer in the affirmative.

> (2) Is there a kind of intentionality that suffices for the phenomenality of our experiences with metaphysical necessity?

> (3) Does the phenomenality of our experiences suffice for a kind of intentionality with metaphysical necessity?

Representationalists and phenomenal intentionalists respectively answer (2) and (3) in the affirmative.[5] Phenomenal schematics, however, remains *neutral* on how to answer (2) and (3). It makes no claims about whether or not phenomenality ever suffices for intentionality with metaphysical necessity, or vice versa. So, phenomenal schematics is distinct from—but also compatible with—representationalism and phenomenal intentionalism.

My aims in this paper are, first, to demonstrate that separatism is false while remaining neutral on the status of representationalism and phenomenal intentionalism, and second, to offer a detailed characterization of the phenomenal structure of our experiences and the specific kinds of constraints that it places upon their possible intentional contents. The result is a novel perspective upon the nature of phenomenal consciousness that is available to all non-separatist philosophers of mind (see §5).

Here, then, is the plan for the paper: In §2, I present my argument for phenomenal schematics. In §3, I compare my own method for exploring phenomenal structure with existing efforts in the literature. In §4, I discuss Kim's and Papineau's arguments for separatism. There I show that those arguments, even if we grant that they are sound, are not strong enough to establish the view. I conclude with phenomenal schematics' key upshot: the phenomenal structures of our experiences are akin to the grammatical properties of written words (or the rules of composition governing the representational elements employed within a given kind of

[5] Some philosophers claim that phenomenality is *identical to* a kind of intentionality (e.g., Chalmers, 2004; 2007). They answer 'yes' to (2) and (3), and so qualify as both representationalists and phenomenal intentionalists.

diagram construction, map drawing, or model building), but, unlike words, phenomenal characters possess their 'grammatical properties' essentially.

2. The Argument for Phenomenal Schematics

In this section, I appeal to a number of variations on the inverted color spectrum and zombie thought experiments in order to motivate phenomenal schematics. The former sort of case involves *phenomenal displacement subjects*, perfect physical/functional duplicates of ourselves whose experiences of a given kind map onto our twins' physiology differently than they map onto our own. Temperature spectrum inverts are one example: what it is like for them to feel moderately warm things is what it is like for us to feel moderately cool things, and vice versa, and so on for all the other gradations of hot and cold, cool and warm. The latter sort of case is that of a *partial zombie*: a subject who lacks some but not all aspects of what it is like to be us. A *visual zombie*, for instance, lacks any and all visual experiences, but is otherwise just like us.

As we shall see, some displacement cases turn out to be *inconceivable* in the sense that they are apriori incoherent: they ask us to consider experiences with incoherent phenomenal structures. Moreover, some partial zombie cases turn out to be *unimaginable* in the sense that we cannot imagine what the partial zombie's experiences would be like (even if those cases turn out to be apriori coherent).[6] These thought experiments ask us to consider experiences with alien phenomenal structures. And finally, the conceivable displacement and imaginable partial zombie cases ask us to consider experiences with phenomenal structures that are identical to our

[6] The unimaginability of partial zombies differs from extant examples of unimaginable experiences, e.g., bat experiences (Nagel, 1974). In the case of unimaginable partial zombies, we are already familiar with *every aspect* of what it is like to be the partial zombie; partial zombies *only* differ from us in *lacking* some aspects of what it is like to be us. There are no alien phenomenal characters involved, unlike the bat case.

own. What these cases collectively show us, I shall argue, is that the phenomenal structure of our experiences is a compositional and systematic structure akin to the grammatical rules for combining words within a language (or the rules for concatenating different representational elements in diagram construction, map drawing, and model building). Phenomenal structure governs how different kinds of phenomenal characters can and cannot be combined and, as we shall see, thereby constrains our experiences' possible intentional contents.

2.1 Displacement Cases

Let us begin with a handful of conceivable displacement cases. The inverted color spectrum is the classic case. The inverted temperature spectrum is another example. Olfactory and gustatory displacement cases also seem to be readily conceivable. We seem to have no difficulty conceiving of subjects for whom what it is like to taste sweet things is what it is like for us to taste sour things, and vice versa, or for whom ammonia smells like roses, and vice versa.[7]

2.1.1 Visual-Shape Displacement

Now let us consider some apriori incoherent cases. First, let us try to imagine perfect physical/functional duplicates of ourselves for whom what it is like to see spheres is what is like for us to see cubes, and vice versa. This *visual-shape displacement case* can be deeply puzzling. For instance, what is it like for our visual-shape displaced twins to see shapes besides cubes and spheres, such as pyramids, ellipsoids (rugby balls), or tori (donuts)? Moreover, for normal subjects, what it is like to see a sphere is the same regardless of the sphere's orientation, but this is not so for cubes. So, do rotating spheres look like rotating cubes or stationary cubes to our twins? And what determines whether a sphere looks like a cube seen from one orientation as

[7] It may not be possible to preserve the relationships of similarity between our experiences of different odors and tastes, such as the similarities between the scents of different kinds of flowers.

opposed to another? And finally, what do the shadows or cross-sections of spheres and cubes look like for our twins?

Questions like these are difficult to answer, and there is a plausible reason why. The descriptions of color and temperature spectrum inversion provide us with a general procedure for taking our own experiences in a given circumstance and transforming them in order to arrive at an understanding of what our inverted twins' experiences must be like in equivalent circumstances. We just 'find and replace' experiences of red with experiences of green, and vice versa, and so on. In doing so, we face no conflicts, where we must replace an experience of red with an experience of green *and also* an experience of purple. And we face no ambiguities, where we could replace an experience of red with *either* an experience of green *or* an experience of blue. In contrast, the visual-shape displacement case gives us no general procedure for translating between our own and our twins' experiences of shape; indeed, it could not. This is because (a) the surfaces of cubes have geometrically privileged parts and the surfaces of spheres do not, (b) the phenomenal characters of our experiences of the parts of cubes and the parts of spheres reflect their respective heterogeneity and homogeneity, and (c) our experiences have a systematic and compositional character to them. Allow me to elaborate upon these points, beginning with (c).

The phenomenal characters of our visual experiences are *systematic* and *compositional*: If we hold orientation, size, color, etc. fixed, then what it is like to see a three-dimensional, right-angled vertex as part of a cube is largely the same as what it is like to see a three-dimensional, right-angled vertex as the peak of a three-sided pyramid. The reason for the qualification 'largely the same' is that we may need to accommodate gestalt, repetition, fatigue, and attentional effects as well as the differences between central and peripheral vision. But even

when we take such influences into account, there remains a striking degree of similarity between our experiences of one three-dimensional, right-angled vertex and another regardless of what sort of shape that vertex is seen as a part of. Moreover, what it is like for us to see a cube that is red, for instance, is a function of what it is like for us in general to see red things and what it is like for us in general to see cubes. The phenomenal characters of our total experiences at a time are (typically) a function of the less-than-total phenomenal characters that make them up.[8]

Visual-shape displacement would necessarily violate the systematic and compositional character of our experiences. Whereas cubes have geometrically privileged parts—straight edges, square faces, and right-angled vertices—spheres lack geometrically privileged parts—they only have regions of positive, uniform curvature. Importantly, our experiences of the parts of cubes reflect their heterogeneity: what it is like to see a vertex of a cube differs from what it is like to see an edge of that same cube. And our experiences of the various surface regions of spheres reflect their homogeneity: if we view the different surface regions of a sphere from the same orientation, and we hold their color and texture fixed, one part of a sphere looks just like any other.

We would need a *many-to-one mapping* in order to 'translate' from our visual experiences of cubes and their parts to our twins' experiences of cubes and their parts. Our twins' experiences of what are in fact straight edges, square faces, and three-dimensional, right-angled vertices would all need to have the phenomenal character that our experiences have when we see regions of positive, uniform curvature. And we would need a *one-to-many mapping* to translate from our visual experiences of spheres and their parts to our twins' visual experiences of spheres and their parts. Some but not all of our twins' experiences of what are in fact regions

[8] Gestalt experiences may be an exception to this general rule.

of uniform, positive curvature would need to have the sort of phenomenal character that our experiences have when we look at three-dimensional, right-angled vertices, and similarly for straight edges and square faces.

Moreover, our experiences of the parts of spheres and the parts of cubes can be parts of our experiences of other sorts of shapes.[9] Hemispheres have regions of three-dimensional, positive, uniform curvature. And any number of shapes besides cubes have straight edges, square faces, and three-dimensional, right-angled vertices. The many-to-one and one-to-many mappings between our experiences and our twins' experiences of the parts of cubes and spheres prevent us from being able to identify a unique phenomenal character that would be associated with our twins' experiences of straight edges—and similarly for square faces, right-angled vertices, and regions of uniform, positive curvature. Any efforts to enforce the systematicity and compositionality of our experiences would terminate in conflicting (many-to-one) and ambiguous (one-to-many) displacements.

The visual-shape displacement case violates the systematicity and compositionality of our shape experiences and, consequently, undermines the very features of our visual experiences of shape that enable them to systematically represent the world around us. Our experiences of right-angled vertices, for instance, can serve to systematically represent right-angled vertices because our experiences of shapes that include right-angled vertices as geometrically privileged parts are themselves partly composed out of our experiences of right-angled vertices.[10] For our twins, there could be no one phenomenal character that could serve in general to represent right-angled vertices and that could always play the same role in composing their experiences of

[9] Bayne and Chalmers (2003) also attribute a (quasi)mereological structure to consciousness.
[10] Michael Tye (2003) claims that only total experiences exist. We can reformulate the present discussion in terms of ways that total experiences can be similar to or different from one another.

shapes that contain right-angled vertices. Our twins' experiences of shape would lack the systematic and compositional structure that allows those experiences to function as a means of representing shapes, their parts, and arrangements of those parts.

The problems with visual-shape displacement do not end there. The phenomenal characters of our experiences of cubes and spheres are systematically related to the phenomenal characters of our experiences of other shapes even when those other shapes contain none of the geometrically privileged parts of cubes or spheres. Ellipsoids contain no regions of uniform, three-dimensional curvature, yet the closer an ellipsoid approximates perfect sphericity, the more similar our experiences of that ellipsoid will be to our experiences of a sphere. More generally, similarly shaped objects tend to produce experiences with similar phenomenal characters. Visual-shape displacement would necessarily violate this general feature of our experiences due to the requirement for many-to-one and one-to-many mappings between our twins' experiences of shape and our own.

Moreover, at least some projective-geometric relationships appear to be latent in visual experience. Consider what it is like to look at a cube that is casting a shadow onto a warped table top. The shapes of the cube, its shadow, and the table top may not have any geometrically distinguished parts in common. Nevertheless, the shapes of the cube, its shadow, and the table top are all systematically related to one another, and these relationships appear to be reflected in the phenomenal character of our visual experiences. Our experience of the shape of the shadow 'makes sense' given our experiences of the shapes of the cube and the table top. Subjects unfamiliar with projective geometry would be hard-pressed to articulate what this system of relationships is, but it seems plausible that this network of relationships will often be isomorphic

to those described by a projective, approximately Euclidean geometry.[11] Visual-shape displacement would disrupt this feature of our visual experiences.

What these observations suggest is that our visual experiences possess not only a compositional and systematic structure, but a *geometric* structure as well. The kinds of geometric relationships that are definable between different shapes of objects and their parts are themselves reflected in the relationships between our experiences of those shapes and their parts.[12] Just as squares are composed of straight edges, right-angles, and their arrangement, our experiences of squares are composed of our experiences of straight edges, our experiences of right-angles, and our experiences of their arrangement. Visual-shape displacement would undermine this geometrical structure of our visual experiences due to the requirement for many-to-one and one-to-many mappings between our twins' and our own experiences of the parts of cubes and spheres.

2.1.2 Yellowness-Itchiness Displacement

Let us try to imagine a subject for whom what it is like to feel itchy is what it is like for us to see yellow, and vice versa. The widespread awareness of synesthesia can lead to misinterpretations of the case that I want to avoid.[13] I am asking us to imagine a subject whose experiences of itchiness play the exact same role in composing her visual experiences that our experiences of yellow do in composing our visual experiences. Her experiences of itchiness combine with her visual experiences of shape, size, distance, motion, texture, and colors besides

[11] I say 'approximately Euclidean' because visual experience's representation of space may violate the parallel postulate (see Masrour; 2014). Indeed, there may be no single geometry for visual space (Wagner, 2006). However, the distinctively non-Euclidean features of our visual experiences are not obvious enough to be noticed in ordinary circumstances and require careful experimentation to detect.

[12] The experiences of visual form agnosia subjects (Efron, 1969) plausibly lack this kind of structure.

[13] I am not asking us to imagine a subject who feels itchy every time she sees something yellow or who has a visual sensory image of yellow somewhere in her visual field whenever she feels itchy. And I am not asking us to imagine a subject who has visual illusions that parts of her bodily surface turn yellow when they itch, or who sees yellow objects as suffering from itchiness.

yellow in order to compose her visual experience of, for instance, a color gradient that transitions from blue to yellow.

Moreover, I am asking us to imagine a subject whose experiences of yellow play the role in composing her experiences of her body surface that experiences of itchiness play in shaping our experiences of our body surfaces. For instance, experiences of yellow can combine with experiences of warmth, felt-texture, and pressure to compose the sort experience of that someone who is allergic to cats might have when a cat rubs against her leg.

The case seems odd, to say the least. And the reason seems to be that experiences of yellowness and experiences of itchiness play very different sorts of roles from one another in composing what it is like to be us at a time. One key difference between these two experiences stems from the fact that visual and bodily experiences appear to utilize *different kinds of representation of space*. For healthy, adult subjects, vision appears to use a three-dimensional, projective, and approximately Euclidean representation of space (§2.1.1). The senses of touch, proprioception, and kinesthesia, on the other hand, seem to employ a topological representation of the body-space. Itchiness appears to be represented as a kind of state that regions of the body surface can take on, one that compels us to scratch the affected area until the state dissipates. The joints are represented as points of articulation to which forces are applied endogenously through muscle activity and exogenously through the actions of external objects. Temperatures can occupy areas of the body surface or regions of the body volume. And pressures are experienced as deforming the resting shape of the body and as requiring certain kinds of actions to resist or overcome.

Audition appears to use a radial representation of space that often fails to include much if any information about the shapes, sizes, and distances of heard objects. Auditory spatial

representation primarily concerns the angle of the sound source with respect to the orientation of the subject's head and whether the sound source is approaching or receding.

Olfaction and gustation appear to carry no spatial information at all. The smells that we smell and the tastes that we taste have locations, but our olfactory and gustatory experiences do not themselves represent a space in which those odors and tastes are located; other senses carry that information.

What I would like to suggest is that displacing experiences across sensory modalities will generally prove inconceivable because our experiences of different sorts of properties are '*formatted*' in terms of the different kinds of spatial representations employed by our sensory modalities. The ways in which our less-than-total experiences within a given modality can combine with one another to compose our total experiences within that modality are defined in terms of how they can occupy and be located within whatever kind of representation of space that modality employs (be it projective and approximately Euclidean, radial, or topological). After all, the idea that what it is like for us to *feel* squares could have been what it is like for us to *see* squares, and vice versa, hardly seems any more comprehensible than the yellowness-itchiness displacement case. Bodily experiences of itchiness and felt squares are formatted in terms of a topological representation of the body-space; visual experiences of yellowness and seen squares are formatted in terms of a projective and approximately Euclidean representation of visible-space.

2.1.3 The Pressure-Temperature Displacement Subject

Finally, let us return to our example from the introduction and try to imagine physical/functional duplicates of ourselves for whom what it is like to feel temperatures is what it is like for us to feel pressures, and vice versa. If you press your left index finger straight down

into your right palm, and then at a 45°, you can match the two experiences in terms of the degree of force even though they differ in the direction of force. What we see is that there are two components to our experiences of pressure: one corresponding to the degree of force and the other to the direction of force. If we wanted to formally model our experiences of pressure, we would need to use a *vector* (or vector gradient). Temperatures, on the other hand, only come in degrees. They have no 'second component'. If we wanted to formally model our experiences of temperature, we would need to use a *magnitude* (or magnitude gradient), not a vector. We could use positive numbers to represent the warm/hot-side of the spectrum, negative numbers to represent the cool/cold-side, and zero to stand for body-neutral temperatures.[14]

The pressure-temperature displacement case provides us with our first glimpse of how we could offer a formal characterization of the structure of phenomenal consciousness. Different sorts of experiences will require different sorts of formal representations—vectors vs. magnitudes—and experiences that require different sorts of formal representations are not displaceable even when they both belong to a single sensory modality or cluster of sensory modalities that involve a common spatial formatting—such as the haptic, kinesthetic, and proprioceptive modalities.

To emphasize the point, consider itchiness once again. We can be more or less itchy. Our experiences of itchiness would be best formally represented by a magnitude. But, unlike our experiences of warmth, there is no clear opposite of our experiences of itchiness. A good formal characterization of our experiences of itchiness would use zero to represent no itchiness at all and ever larger numbers to represent increasing degrees of itchiness. Formal representations of

[14] At extreme temperatures, experiences of hot and cold become increasingly indistinguishable. Temperature experiences will ultimately require a more complicated model than a number line.

temperature experiences, in contrast, would need to include an axis of symmetry around which distinct but symmetrical experiences of hot and cold, cool and warm are located.

2.2 Partial Zombies

I want to begin this subsection by discussing a handful of imaginable partial zombies before moving onto some unimaginable (but perhaps apriori coherent) ones. Examples of imaginable partial zombies are relatively easy to construct. For instance, it seems relatively easy to imagine partial zombies who lack the sorts of experiences associated with any particular sensory modality; visual zombies, auditory zombies, tactual zombies, etc. It also seems fairly easy to imagine zombies who lack any and all experiences associated with a given region of egocentric space. A partial zombie might lack all experiences associated with the right half of her visual field, or the left half of her body, or anything that would be heard as coming from behind her.

What the imaginability of these cases suggest is that we think of sensory modalities and regions of egocentric space as forming 'partitions' such that we can imagine eliminating all the experiences associated with one partition without rendering the experiences associated with other partitions unrecognizable. For example, we can imagine 'zombifying' our visual experiences without being forced to imagine any dramatic changes in our auditory or haptic experiences that would render them unrecognizable as auditory or haptic experiences of the sort had by healthy, adult subjects. And we can imagine zombifying our experiences of the right halves of our bodies, for instance, without having to imagine any dramatic differences in our experiences of

the left halves of our bodies that would render them unrecognizable as the sorts of experiences had by normal subjects.[15]

Notice, however, that we cannot always zombify a kind of experience without radically altering the remaining experiences. Consider the *visual-shape zombie*. She has no visual experiences of shape whatsoever, but she does have visual experiences of size, motion, orientation, texture, color, and luminance. What it is like for her to see a circle does not differ from what it is like to see a square so long as the two objects are matched for area, color, motion, etc. The visual-shape zombie's visual experiences are as shapeless as the taste of a lemon.

The case is hard to imagine (though it does not seem to be incoherent). And the reason seems to be that it asks us to consider experiences where the structure of the zombie's residual visual experiences differs from the structure of those sorts of experiences when had by normal subjects. The visual-shape zombie's visual experiences lack the geometrical structure that ours possess (§2.1.1). And this is a structure that our visual experiences of properties besides shape require in order to play their normal role in composing our total visual experiences. For normal subjects, we do not see the size of an object independently of its shape; we see that size as the size of that object's shape. And when we see the color and the texture of an object, the color and texture of the object 'fill out' the shape of that object. We cannot simply eliminate our visual experiences of shape without altering how our experiences of color, texture, and size combine to compose our total visual experience in the way that we could simply eliminate the predicate *square* from $\exists x(red(x) \,\&\, large(x) \,\&\, square(x))$ without altering the role that the other predicates

[15] I want to remain neutral on the possibility of multi-sensory experiences, such as audio-visual experiences of popping balloons. And, I do not want to deny that there can be gestalt experiences that range over regions of the visual field or the body surface. My claim is that we can imagine eliminating the visual component and any multi-sensory components from our audiovisual experience of a popping balloon and retain an auditory experience that is recognizable as a relatively normal auditory experience. Moreover, my claim is that we can imagine zombifying the right-half of our visual fields such that, when we look at duck-rabbit drawings, our residual experiences in the left-halves of our visual fields are still recognizable as visual experiences of the sort had by normal, adult subjects.

play in composing that sentence. The systematic roles that our experiences of shape, color, texture, and size play in composing our total visual experiences are interdependent.

Finally, let us consider the *color-luminance zombie*: a subject for whom there is nothing that it is like to see different colors, different degrees of illumination (sunlight vs. moonlight), and different shades of black and white and grey. The color-luminance zombie only has visual experiences of shape, size, texture, orientation, distance, and motion. For this subject, there is no difference in what it is like to see a black or a white cube, or a brightly lit or a dimly lit cube, or a red or a green cube so long as they are matched for size, orientation, etc. Her visual experiences are *purely spatial*. Even in the case of transparent objects, the color-luminance zombie does not experience any alterations (such as magnification or warping) of the color-luminance boundaries of the objects that are seen through those transparent objects. The color-luminance zombie's visual experiences are as colorless and luminance-free as the sound of breaking glass.

What the visual-shape and color-luminance zombies conjointly suggest is that the systematic role that our experiences of color play in composing our total visual experiences rely upon our experiences of shape playing their role in composing our total visual experiences, and vice versa. More generally, the roles that our experiences of primary and secondary qualities play in composing our total experiences within a given modality appear to be mutually interdependent. The secondary qualities are defined in terms of the kind of spatial representation that they are embedded in (§2.1.2). And primary properties, at least for us, appear to require secondary qualities to 'fill them out'.[16]

[16] There is much more to be said on this topic than I can say here.

2.3 Bringing It All Together

Our intuitions concerning displacement and partial zombie cases are quite systematic. In the conceivable displacement cases, the displaced experiences play equivalent roles in composing our total experiences at a time. In the readily imaginable partial zombie cases, we imagine subtracting experiences in such a way that the structure of the residual experiences remains unchanged. In the auditory zombie case, for instance, the structure of our visual and haptic experiences remains unchanged; there simply is no experiential representation of how things stand acoustically.

The unimaginable partial zombie cases ask us to consider experiences with alien phenomenal structures: the role that the residual experiences play in composing our total experiences depend upon the role that the zombified experiences play in composing our total experiences. As a result, the residual experiences cannot play their normal role in composing our total experiences at a time.

The apriori incoherent displacement cases ask us to imagine experiences with incoherent phenomenal structures. Those experiences would violate the compositional and systematic structure that our experiences have and in virtue of which any given less-than-total experience, such as our visual experience of a straight line, can serve to systematically represent a particular subject matter, such as straight lines.

While we shall return to these issues in §5, what we see is that phenomenal structures are akin to the grammatical properties of words or the rules of composition governing the representational elements employed in a given system of diagraming, mapping, or modeling (such as, topographic lines). Just as a one-place predicate can only represent a property and a two-place predicate can only represent a binary relation, temperature experiences can only

represent a magnitude that is acting on the body surface or that is distributed throughout the body volume. This is because temperature experiences have the structure of a magnitude defined over a topological representation of the body-space. Moreover, just as we could not use images of squares to represent circles and images of circles to represent squares when drawing geometric figures in a Cartesian coordinate plane, we could not displace the phenomenal characters of our experiences of cubes with the phenomenal characters of our experiences of spheres. Doing so would violate the systematic, compositional, and geometric structure of our visual experiences. So, even if the specific phenomenal characters of our experiences do not dictate that those experiences must have the contents that they actually have—and I am neither affirming nor denying that claim here—the phenomenal structures of our experiences constrain their possible representational contents, and different phenomenal structures constrain experiential content in different ways.

3. Methods for Exploring Phenomenal Structure

Phenomenal structure has received relatively little systematic exploration in the literature, and existing efforts typically employ an 'outside-in' methodology: they utilize the results of psychophysics, neurophysiology, and multi-dimensional scaling to backwards engineer the structure of our experiences. C. L. Hardin has pursued this sort of strategy for color perception (1988; 1992), and Austen Clark has executed the project for perceptual experiences more generally (1993). In the previous section, I employed an 'inside-out' methodology, which relies upon the analysis of our intuitive reactions to thought experiments. Here I discuss how the two strategies relate to one another.

The outside-in methodology promises to reveal structural features of our experiences that are too subtle to be noticed in the course of everyday life or even through concerted

introspection. For example, it turns out that human beings can discern more shades of green than red (Palmer, 1999: Ch. 3). Facts like this one are not part of our commonsense understanding of color experience and require careful experimentation to discover.

The inside-out method will tend to identify structural features of our experiences that we can recognize in our own experiences once they are pointed out to us. If we were not sensitive to structural features of our experiences in some way or other, then they could not drive our intuitive reactions to displacement and partial zombie cases in the first place. And the systematicity of our intuitions suggests that we have a tacit grasp of at least some of the structure of our experiences. There is, however, no apriori reason to think that this tacit understanding is complete. Outside-in methods promise to complement the results of inside-out methods by locating phenomenal structures that evade our intuitive grasp.

4.0 Separatism and Phenomenal Schematics

In this section, I review the three arguments that have been offered for separatism, and I show that these arguments cannot establish the view. To see why, we must make a distinction that is often overlooked in the literature. First, there is the weaker claim:

> *Distinctness*: intentionality and phenomenality are distinct in the sense that they are not identical to one another and neither is wholly grounded in or reducible to the other.

Second, there is the stronger claim:

> *Contingency*: intentionality and phenomenality are not only distinct, they are only contingently related to one another.

I shall argue that Kim's and Papineau's arguments cannot establish Contingency, at best they establish Distinctness. And separatism, as it has been understood and presented in the literature, is the stronger contingency claim.[17] As Papineau says:

> *…conscious sensory experiences only represent contingently. Whether a given conscious experience represents a picture, or something else, or nothing at all, depends on factors beyond itself, such as historical correlations to features of an environment, and is not fixed by its phenomenal nature.* 2016, 341

and:

> *The idea isn't that somehow both the qualitative 'mental paint' and the represented objective properties are 'in' the experience. Rather my view is that our conscious experience is all paint, and any representational or represented features are quite external to our consciousness.* 2016, 334

To defend separatism, Kim and Papineau must establish Contingency.

Kim argues that we can in principle offer an adequate functional analysis of intentional contents in terms of sensation, behavior, and cognitive processing; phenomenal characters, however, admit of no such functional analysis (2005: Ch. 6). According to Kim, "qualia inversion is metaphysically possible" (2005: Ch. 6, fn. 18) and so:

> *two perceivers who behave identically with respect to input applied to their sensory receptors can have different sensory experiences… qualia are not functionalizable, and hence physically irreducible.* 2005: 170

[17] William Lycan describes separatism as the view that intentionality and phenomenality, "…are unrelated, except possibly that some mental states happen to have both" (2008, 240). Curtis Brown describes separatism as the view that, "any given phenomenal character could be accompanied by any intentional properties (or none), and vice versa" (2016: §3.4). And David Bourget and Angela Mendelovici characterize it as the view that "consciousness and intentionality do not bear interesting metaphysical relations to each other" (2019, §3.2).

If intentional contents can be naturalized by way of functional analysis and phenomenal characters cannot, then the two must be distinct.

To see why Kim's *naturalization asymmetry* cannot establish Contingency, notice that, as Kim himself argues, we may be able to functionally analyze phenomenal structure:

> *Intrinsic qualities of qualia are not functionalizable and therefore are irreducible, and hence causally impotent… In contrast, certain important relational facts about qualia, in particular, their similarities and differences, are detectable and functionalizable, and can enjoy causal powers as full members of the physical world.* 2005, 173

If both intentional contents and phenomenal structures can be functionally analyzed, then it is possible that at least some of the functions that our intentional contents reduce to are themselves partly composed out of the functions that the phenomenal structures of our experiences reduce to. If so, then phenomenal structure would constrain intentional content. Hence, Kim's argument can establish Distinctness, but not Contingency.[18]

David Papineau (2014; 2016) offers two arguments for separatism. First, is *the abstraction asymmetry*. He argues that any account of intentional content will have to construe intentional content as necessarily involving relationships to either propositions or properties understood as abstract objects, and: "There seems something quite amiss with the suggestion that my here-and-now conscious feelings are constituted by my bearing any kind of relation to abstract entities" (2014: 6).[19] If intentional contents necessarily involve relationships to abstract objects, and phenomenal characters cannot, then they must be distinct.

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[18] I suspect that Kim would be happy with this result. While Kim is the most cited example of a separatist in the literature (e.g., Horgan, 2002; Lycan, 2008; Bourget and Mendelovici, 2019; Brown, 2014; Siewert, 2016), his primary goal in *Physicalism, or Something Near Enough* is to establish the naturalization asymmetry, not Contingency.

[19] Papineau discusses nominalist alternatives and finds them wanting.

Second, while I cannot discuss all of his examples, Papineau appeals to a number of thought experiments and even ordinary situations that support the claims (a) that the phenomenal characters of our experiences are narrow (they supervene with metaphysical necessity upon the physical or functional constitution of the subject) and (b) that the intentional contents of our experiences are wide (they supervene with metaphysical necessity upon environmental factors in addition to subject-internal factors). Call this *the supervenience asymmetry*. If intentionality is wide and phenomenality is narrow, then they must be distinct.

To see why Papineau's arguments cannot establish Contingency, let us consider a comparison with what content externalists should say about the relationship between the neurocomputational states of a subject and the representational contents of her mental states. Content externalists claim that both subject-internal and environmental factors play a role in determining the representational contents of a subject's mental states with metaphysical necessity; perfect intrinsic duplicates can differ in representational contents if their environments differ in suitable ways. But this does not commit externalists to the claim that the neurocomputational states of a subject's brain are only contingently related to the representational contents of that subject's mental states—that any brain state could have been associated with any content. Wide properties can be constrained by narrow properties despite not being identical to, reducible to, or wholly grounded in those narrow properties. Papineau's supervenience asymmetry cannot establish Contingency, only Distinctness.

Finally, notice that content externalists can grant that representational contents necessarily involve relations to abstract objects—though they are not obviously committed to this claim either—and still claim that the concrete here-and-now neurocomputational states of a subject constrain the representational contents of her mental states. Similarly, there is no reason

why the phenomenal characters of our experiences could not constrain what abstract objects they can be related to. So, Papineau's abstraction asymmetry argument can only establish Distinctness.

Kim's and Papineau's arguments at best establish Distinctness, not Contingency. But establishing Distinctness is not sufficient to support separatism, which has been presented and interpreted as Contingency in the literature.

5. Conclusion: The Linguistic Comparison

Separatism and phenomenal schematics disagree over the existence of apriori connections between the phenomenality and intentionality of our experiences. To better understand the nature of this dispute and the more general lesson that phenomenal schematics has to offer, let us consider Papineau's central metaphor for understanding separatism: the comparison of phenomenal characters with the typographical properties of written words:[20]

> *Written sentences are the outputs of processes designed to produce representations that will convey information to readers. It does not follow that all the properties of sentences are essentially representational. Their typographical properties are not… It is entirely contingent that this arrangement of marks on paper means what it does…*
>
> *I think the same about the relation between the conscious and representational properties of sensory experiences: the former stand to the latter just as the typographical properties of sentences stand to their representational contents. It is not essential to a given conscious experience that it stand for the truth condition it does.* 2016: 332

Papineau's comparison does an excellent job of illustrating his view. While one must use some typography or other in order to represent using a written language, that does not mean that

[20] See Papineau 2014: 1-2, 18; 2016: 343, 339-340.

the typographical properties of written words are themselves representational properties, or that the typographical and representational properties of a particular word are any more than contingently related. 'Found', for instance, could have represented ice or the act or declaring war. In parallel fashion, separatists claim, in order to have an experience that can represent whatever it does, that experience must have some phenomenal character or other, but that does not mean that the specific phenomenal character of that experience is any more than contingently related to that experience's representational content.

It is worth noting, however, that at one point Papineau anticipates what I have called phenomenal schematics and says that he is, "happy to allow that the intrinsic nature of certain conscious sensory experiences suits them excellently for certain representational purposes" (2014: 27). But Papineau fails to recognize the significance of this concession for his view. As I shall now argue, if phenomenal schematics is correct, then Papineau's central claims that phenomenal characters, "have no constitutive tie to what they contingently represent." (2016, 343) and that "…conscious sensory properties are not essentially representational at all" (2014, fn. 11) are false.

The phenomenal structures of our experiences place formal and sometimes semantic constraints on the possible intentional contents that those experiences can have, and different structures impose different constraints. In this respect, phenomenal structures are comparable to *the grammatical properties* of written words, not their typographical properties. Interpreted as a transitive verb, you cannot use 'found' in a (grammatical) sentence and fail to represent an action that is performed by a subject upon an object. That is just what it is to be a transitive verb. Here we have both a formal constraint—any sentence that includes 'found' must represent both a

subject and an object—and a semantic constraint—sentences including 'found' must represent an action, as opposed to a mere happening, such as in, 'the battery died'.

Similarly, our temperature experiences, for example, have the formal structure of a magnitude that acts upon the body surface or (regions of) the body volume. This structure imposes a formal constraint—such experiences are poorly suited to represent vectors, since they lack a second component that could serve to represent the vector's directionality—and also a semantic constraint—whatever property our temperature experiences represent must be capable of acting on the surface of the subject's body or being distributed throughout regions of the body volume. If grammatical properties are representational properties, then so are phenomenal structures.

There is, moreover, an important asymmetry between written words and phenomenal characters insofar as phenomenal characters possess their 'grammatical properties' essentially. We can interpret 'found' typographically—as an arrangement of colored shapes—in which case, 'found' could have played representational role played by any other word in the English language. But we can also interpret 'found' grammatically as a transitive verb, in which case 'found' can be modeled as a function that only accepts ordered pairs of noun-phrases as arguments. It has an *argument structure* or *subcategorization*, in the terminology of linguistics. Because we have a typographical way of thinking about words *in addition to* a grammatical way of thinking about words, it is conceivable that 'found' might not have been a transitive verb, that it could have been a noun, for instance.

What phenomenal schematics shows us is that the phenomenal characters of our experiences do not admit of anything like a typographical interpretation. We cannot conceive of alternative versions of our experiences that have argument structures different from the ones that

they actually possess. Were we able to 'think typographically' about the phenomenal characters of our experiences, then we should be able to imagine that what it is like for us to see cubes could have been what it is like for us to see spheres, and vice versa. After all, we have no difficulty in imagining that 'sphere' could have meant cube and that 'cube' could have meant sphere. But phenomenal displacement cases are only conceivable when the experiences involved have equivalent phenomenal structures (the inverted temperature spectrum, for instance). When it comes to thinking about the phenomenal characters of our experiences, the 'grammatical interpretation' is *mandatory*.

What these observations show us is that phenomenal characters are *intrinsically symbolic* in the sense that we can only conceive of them as having specific kinds of phenomenal structure that (a) determine what kind of role they can play in composing our total experiences at a time and (b) constrain the possible contents of our experiences. Papineau's claims that phenomenal characters 'are not essentially representational at all' and that they 'have no constitutive tie to what they contingently represent' are false. An experience could not be the kind of experience that it is without having the specific phenomenal character that it does; we cannot help but conceive of phenomenal characters as having the specific phenomenal structures that they do; and the different kinds of phenomenal structure that our experiences can possess constrain the possible representational contents of those experiences in different ways. This is the central lesson of phenomenal schematics, and it marks a previously overlooked position that should be acceptable to most any non-separatist philosopher of mind.

As noted in the introduction, phenomenal schematics remains neutral on how to answer:

> (2) Is there a kind of intentionality that suffices for the phenomenality of our experiences?

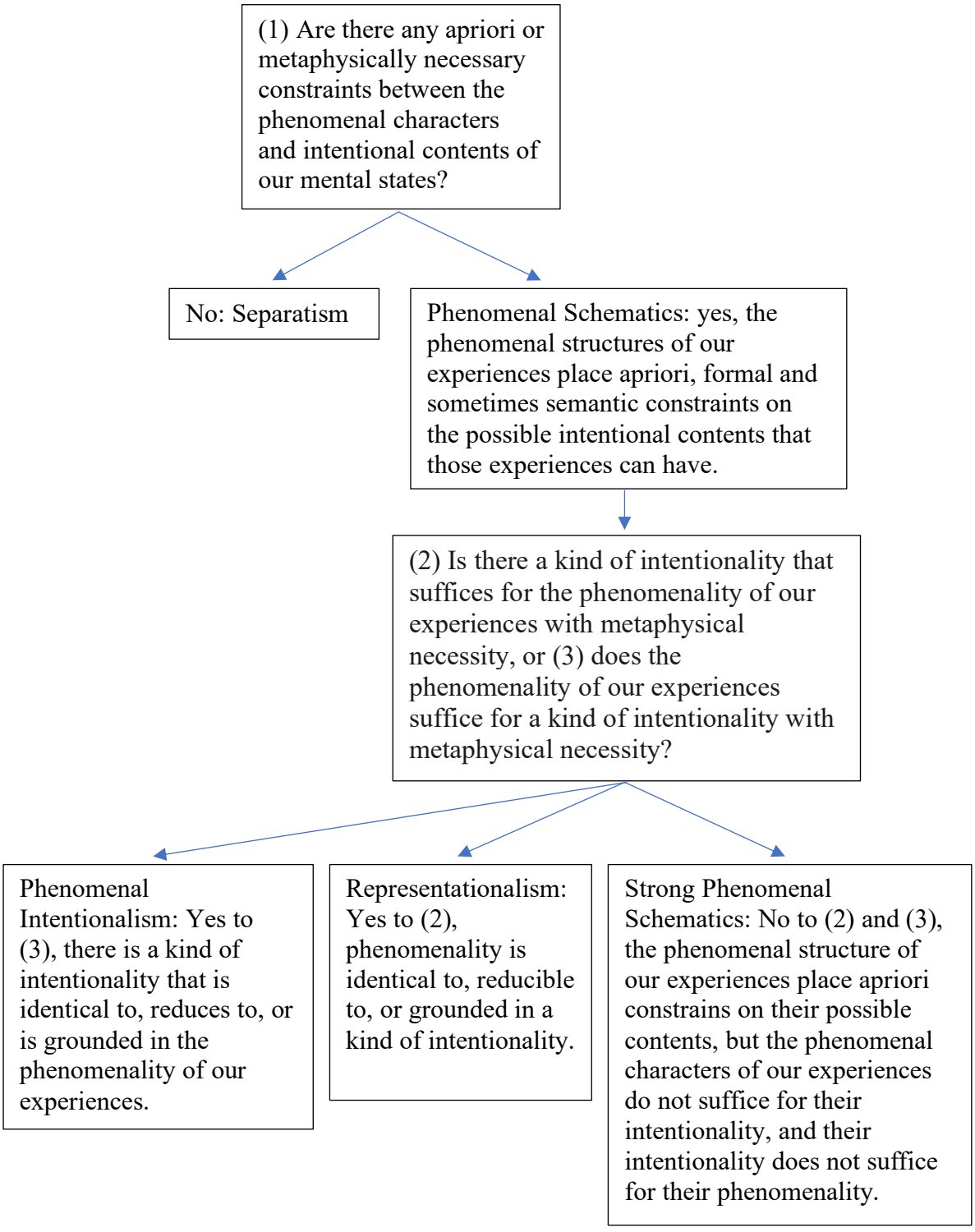
(3) Does the phenomenality of our experiences suffice for a kind of intentionality?

As a result, phenomenal schematics is compatible with both representationalism and phenomenal intentionalism, which respectively answer (2) and (3) in the positive. But phenomenal schematics is not only compatible with these views, it promises to complement them by allowing them to offer more detailed specifications of the phenomenal-intentional relation.

But philosophers who answer (2) and (3) in the negative can also endorse phenomenal schematics. Call the resulting view *strong phenomenal schematics* (see figure 1): while the phenomenal structures of our experiences place non-trivial, apriori constraints upon the possible intentional contents of our experiences, the phenomenal characters of our experiences are not identical to, do not determine, and are not determined by the actual representational contents of our experiences.

Deciding whether to use phenomenal schematics to enrich representationalism or phenomenal intentionalism, on the one hand, or whether to opt for strong phenomenal schematics, on the other, is not a project that I shall pursue here. No matter which option one chooses, phenomenal schematics shows us that phenomenal characters mark a unique kind of representation, one whose structure is comparable to the grammar of a language or to the rules of composition governing the representational elements used in various kinds of diagram construction, maps drawing, or model building. But phenomenal characters possess their 'grammar' essentially. They are essentially symbolic.

Figure 1


(1) Are there any apriori or metaphysically necessary constraints between the phenomenal characters and intentional contents of our mental states?
No: Separatism
Phenomenal Schematics: yes, the phenomenal structures of our experiences place apriori, formal and sometimes semantic constraints on the possible intentional contents that those experiences can have.
(2) Is there a kind of intentionality that suffices for the phenomenality of our experiences with metaphysical necessity, or (3) does the phenomenality of our experiences suffice for a kind of intentionality with metaphysical necessity?
Phenomenal Intentionalism: Yes to (3), there is a kind of intentionality that is identical to, reduces to, or is grounded in the phenomenality of our experiences.
Representationalism: Yes to (2), phenomenality is identical to, reducible to, or grounded in a kind of intentionality.
Strong Phenomenal Schematics: No to (2) and (3), the phenomenal structure of our experiences place apriori constrains on their possible contents, but the phenomenal characters of our experiences do not suffice for their intentionality, and their intentionality does not suffice for their phenomenality.

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