ORIGINAL ARTICLE

Phenomenal Blending and the Palette Problem

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I discuss the apparent discrepancy between the qualitative diversity of consciousness and the relative qualitative homogeneity of the brain's basic constituents, a discrepancy that has been raised as a problem for identity theorists by Maxwell and Lockwood (as one element of the 'grain problem'), and more recently as a problem for panpsychists (under the heading of 'the palette problem'). The challenge posed to panpsychists by this discrepancy is to make sense of how a relatively small 'palette' of basic qualities could give rise to the bewildering diversity of qualities we, and presumably other creatures, experience. I argue that panpsychists can meet this challenge, though it requires taking contentious stands on certain phenomenological questions, in particular on whether any familiar qualities are actual examples of 'phenomenal blending', and whether any other familiar qualities have a positive 'phenomenologically simple character'. Moreover, it requires accepting an eventual theory most elements of which are in a certain explicable sense unimaginable, though not for that reason inconceivable. Nevertheless, I conclude that there are no conclusive reasons to reject such a theory, and so philosophers whose prior commitments motivate them to adopt it can do so without major theoretical cost.

1 The palette problem

Consider the following passage from Michael Lockwood:

> There is nothing qualitatively distinctive about a neuron in the auditory cortex, or the corresponding action potential, to mark it out from a neuron, or the firing of a neuron, in the visual cortex. So how, on this basis, is one to account, say, for the fundamental phenomenological difference between a sound and a flash? . . . It seems inconceivable in much the same way, and for much the same reasons, that it is inconceivable that an artist, however skilled, should conjure the simulacrum of a Turner sunset from a palette containing only black and white paints.(1992, p. 546)

This passage presents a concern that the structural features of the mind and of the brain are incompatible: one qualitatively rich, one qualitatively sparse. This is one

aspect of a broader discussion Lockwood gives about such structural discrepancies, but in this paper I am specifically concerned with this problem, which I follow Chalmers (Forthcoming) in calling 'the palette problem'.

Who is this a problem for? Lockwood raises it as a problem for mind–brain identity theories in general, both reductive and non-reductive, which are *prima facie* committed to a structural isomorphism between mind and brain. There are various ways for a defender of such a view to defuse the problem by arguing that we should not expect this isomorphism—for instance, if strong emergentism is true, then it is only to be expected that the structure of emergent mentality differs from that of the underlying brain, and if reductive representationalism is true, the apparent discrepancy might be explained as arising from a lack of isomorphism between content and vehicle. But in this paper I am interested in the prospects for views which maintain this isomorphism, and so must confront the palette problem (cf. Maxwell 1978, Stoljar 2001).

In particular, the palette problem has resurfaced recently in debates over panpsychism, the view that all of reality has a mental nature, and more precisely over 'constitutive panpsychism', the view that human mentality is constituted by the mentality of our myriad physical parts. Critics have claimed that lots of micro-minds are just as unable to explain a single unified mind as the non-mental would be: this has come to be called 'the combination problem', and the palette problem is one strand of this.[1] In general, we may say that the palette problem faces views on which the physical and mental aspects of reality systematically mirror each other, point for point and part-whole-relation for part-whole-relation.

2 The small-palette hypothesis

Chalmers distinguishes 'small palette' and 'large palette' approaches to the problem: small-palette approaches claim ''that all macroqualities can be generated from just a few microqualities, if we find the right underlying microqualities'', while on large-palette approaches, we ''suggest instead that the full range of macroqualities are included among the microqualities . . . [including] colors, sounds, smells, tastes, and so on'' (Forthcoming, p. 26).

Small-palette approaches, but not large-palette approaches, imply 'phenomenal blending', defined as the instantiation of one phenomenal quality by a subject, as an automatic consequence of their instantiating two (or more) distinct phenomenal qualities suitably related.

Call the latter qualities the 'ingredients', and the former the 'resultant'. Their relation is synchronic, and the ingredients are meant to persist, not to 'vanish' into the resultant so as to no longer be instantiated. But nor is the resultant 'mere appearance': within experience, reality and appearance cannot come apart. This definition is deliberately strong—the ingredients and the resultant are all really there, being genuinely experienced, even though experiencing the resultant is simply experiencing all the ingredients rightly related.

When I say that the subject 'automatically' instantiates the resultant, I mean with something stronger than nomological necessity. The link between ingredients and

resultant must be a transparent one, making the resultant intelligible as 'nothing over and above' the ingredients, with no 'explanatory gap' between the ingredients and the resultant.

To elaborate on the small-palette approach, we can formulate a 'small-palette hypothesis'[2]:

> There are a small number of basic qualities, which the simplest conscious parts of the brain support experience of; larger more complex brain parts support experience of the resultants of blending these. For each determinate sort of brain part, up to and including the whole brain, its structure determines a subset of phenomenal qualities out of all the possible combinations that its components' could blend into: e.g. the brain's structure dictates that we can experience redness and whiteness in the right relation to blend, *via* the visual field, but cannot experience loudness and whiteness 'together' like that.

This leaves unspecified what the right relation for blending is; the crucial point is just that the diversity arises from the structure in which basic elements exist, not from a diversity of basic elements. My final section suggests one way of specifying the relation.

Large-palette solutions avoid the need for phenomenal blending, but at the cost of a bloated ontology with hundreds of fundamental phenomenal properties[3]; by contrast, small-palette approaches give us exactly what parsimony demands: a small set of basic elements generating a vast diversity of observed forms. Moreover, only small-palette approaches are compatible with 'Russellian' approaches to the problem of mental causation, given the plausible premise that the fundamental physical causal powers are few in number (corresponding to the small number of fundamental properties that physics seems to describe). On the Russellian approach, physical properties are analyzed as complex dispositional roles, for which phenomenal or proto-phenomenal properties provide the intrinsic/categorical basis.

Since I am attracted to Russellianism, and to the ideal of parsimony, I am (like Chalmers) very attracted to the small-palette hypothesis. This faces three potential objections:

- Phenomenal qualities cannot be blended at all (i.e., that the 'palette' metaphor is misleading from the beginning);
- Even if some can, many others are knowably basic and unblended;
- Even if all our qualities might be blended, there is no suitable set of basic qualities which all can be blended out of.

Section 3 adduces plausible examples of phenomenal blending in familiar experience, and Section 4 argues that we have no good reason to limit the possibility to only some qualities. Section 5 considers and rejects an argument against the possibility of blending. Section 6 argues that if it blending is possible, we have no good reason to rule out the systematic and ubiquitous blending involved in the small-palette hypothesis. Finally, Section 7 discusses a possible specification of the hypothesis. My conclusion is not that

the small-palette hypothesis is true, but that if one's background theory motivates it, then there is no theoretical obstacle to endorsing it.

3 Actual examples of phenomenal blending?

To determine whether phenomenal blending is possible, we should first ask if we know of some actual cases, where we sometimes experience the ingredients on their own, and can see that their nature suffices to explain that of the blends we also sometimes experience. I think a number of examples invite that analysis.

The set of examples most often appealed to is colors. Lewtas suggests that orange experiences result from blending red-experiences with yellow-experiences (Forthcoming, p. 54); in a similar vein Chalmers writes that "If the same entity simultaneously is aware of a degree of redness and aware of a degree of whiteness (at the same location), it is plausibly aware of pinkness (at that location)."(Forthcoming, p. 26). This accords with the historical popularity of what Mizrahi 2009 calls a "'phenomenalist' view of colour composition" (p. 2), on which 'binary' colors like orange and pink appear different to us from 'unitary' colors like red and blue.

Another candidate is flavors—the flavor of a given food or drink being a blend of tastes and aromas provided by its ingredients. But here we must be careful. Psychologists, following McBurney 1986, have distinguished two ways for sensations to combine: *synthesis*, when "when two stimuli that have been mixed in a solution lose their individual qualities in order to form a new (third) sensation" (Auvray and Spence 2008), and *fusion*, when "sensations combined to form a single percept [which] . . . remains analyzable into its constituent elements even when otherwise perceived as a whole." (Prescott 2012).

Since this distinction is usually phrased in terms of combination of *stimuli*, and since the authors generally do not take themselves to be committing to any particular view on the metaphysics of phenomenal qualities, I will not employ this terminology directly, but will instead distinguish two forms of blending: the stronger form is 'seamless', so that the ingredients cannot be individually attended or otherwise 'picked out', while the weaker form is 'discernible', where the ingredients are not individually salient but can be picked out with sufficient effort and training.

The small-palette hypothesis concerns seamless blending, and so flavor perception is not a directly supporting example since it is usually described as a case of fusion, where the flavor "ha[s] a curiously unitary character . . . [but] by directing the attention, in the light of past experience, first to one and then to another aspect of the given whole . . . we can distinguish the separate components"(Tichener 1909, §34). Thus even if flavor perception involves phenomenal blending, it is 'discernible' blending, not 'seamless' blending. But those cases which psychologists tend to describe as cases of 'synthesis', like the combination of colors and odors, are plausible candidates for seamless blending.

For an example of blending across modalities, we might consider the two components of pain which neuropsychology has shown to be dissociable—the affective-motivational

(which makes pain feel bad) and the sensory-discriminative (which lets us distinguish pain from other bad feelings, and assign it a definite cause and location).[4] An affect and a sensation are of distinct sorts, but blend so seamlessly into familiar pain that we find it hard to imagine them in isolation, and are surprised when we hear of subjects with one but not the other.

There may well be more examples, but these are enough to make the case; if they do not, it is unlikely that more would.

4 Phenomenologically simple character

Maybe some qualities can be the resultants of blends, but only because they displayed a 'phenomenologically composite' character all along. Other qualities display a 'phenomenologically simple' character, and cannot be blends—for instance, maybe pink is visibly a mixture of white and red, but white and red are both positively experienced as simple, and hence cannot conceivably arise through blending.

I cannot directly refute this claim, but I think it is at least as plausible that 'phenomenologically simple' character is simply our having no idea of, or a confused idea of, the ingredients in a blend. Often a quality initially seems simple and unanalysable—until further experience lets us discern the components within it. Dennett describes an auditory example of this phenomenon, in which the sound of a chord played on a guitar appears simple and pure to the untrained ear, but comes to seem composed of distinct notes when one is familiar enough with the notes individually to recognize them in the mixture (1991, pp. 73–74). In a similar vein, wine tasters often say that with practice, one learns to discriminate the different components of a wine's taste. And of course the above example of pain is also pertinent. And research showing that, e.g., untrained subjects frequently construe certain odors as increasing the sweetness of a taste, while trained subjects do not (Bingham et al. 1990), reinforces the point that we are often fallible in distinguishing different sensations.

Perhaps in all these cases, there was no real 'phenomenologically simple' character to begin with; but then how sure can we be that there is such a character in the case of, say, redness? It seems to me equally reasonable to think that all qualities seem phenomenologically simple until we can discern their ingredients—so that the apparent simplicity of a given quality does not warrant us in denying that it has ingredients.

5 *A priori* arguments against blending

It is sometimes claimed that blending can be conclusively ruled out *a priori*. Here is a representative passage from James:

"I find in my students an almost irresistible tendency to think that we can immediately perceive that feelings do combine. "What!" they say, "is not the taste of lemonade compounded of that of lemon *plus* that of sugar?" This is taking the combining of objects for that of feelings. The physical lemonade contains both the

lemon and the sugar, but its taste does not contain their tastes, for if there are any two things which are certainly *not* present in the taste of lemonade, those are the lemon-sour on the one hand and the sugar-sweet on the other. These tastes are absent utterly.''(1890, p. 158)

What is James's reasoning here? If he is simply asserting that blending never happens, that should not convince us. Perhaps he is relying on his general compositional nihilism, on which phenomenal qualities don't combine because nothing does. But then it should not convince us if we are unconvinced by that general view about composition.

Thirdly, James might be saying that because the sourness of lemon is subtly intrinsically changed by being mixed with the sweetness of sugar, it is not present in the complex. In most contexts this would be fallacious, since part-whole relations typically involve the parts affecting each other. But there may be a special reason for objecting to such mutual adjustment in the phenomenal case, a reason articulated and attributed to James in a recent paper by Pierfrancesco Basile.[5] Since how a quality is experienced is essential to it, if it is experienced differently in different contexts, it is numerically distinct in those different contexts. Hence though parts are often changed by being in a certain whole, phenomenal qualities cannot be, because any phenomenal change makes them a different quality.

If we grant this argument from phenomenal essentialism, and suppose that in tasting lemonade the sweetness and sourness are phenomenally altered in some subtle fashion, then the taste of lemonade cannot be a blend *of the very same qualities* as are experienced in other circumstances. But the taste of lemonade may still be a blend; its ingredients may be the subtly-different 'counterparts' of the sweetness and sourness experienced in other circumstances.[6] No plausible holistic view can deny that we often experience phenomenal qualities, in different contexts, which are at least similar enough to warrant us calling them 'the same'. And this same near-identity can be used to make sense of what James's students thought: that 'the same' qualities are present in the lemonade-blend and in isolated experiences. Thus even if this argument succeeds, it merely constraints which blending claims we can make, without ruling out blending in general.

A final reading is that James offers the following argument:

(a)   I am not experiencing the sourness of lemon
(b)   *Therefore*, the sourness of lemon is absent from my experience

Hence blending is incoherent, simply because what it is like to experience the whole (the taste of lemonade) is not the same as what it is like to experience a part (sourness).

I believe this argument equivocates between two senses of 'is experiencing the sourness of lemon'. On the first reading, this means 'has an experience of lemony-sourness as their sole taste experience', while on the second, it means 'has a taste experience of lemony-sourness, perhaps among others'. Compare two readings of ''fills this cup'', either as ''fills this cup exactly'' (which tells us the thing's volume) or as ''fills this cup and possibly more'' (which tells us only a lower bound on its volume).

In the first sense of 'experiencing the sourness of lemon', claim *a* is true, but does not imply claim *b*. In the second sense, claim *a* is question-begging, for if the taste of lemonade is a blend then the subject *is* experiencing lemony-sourness (blended with something else). Hence there is no sound argument from *a* to *b*.[7]

I see no compelling reason to think blending impossible. That does not mean that blending is possible (or actual): one might insist while the lemonade-experiences arise from the cooccurrence of the processes that independently produce sweet-experiences and sour-experiences, they are not literally composed of those two. Sweet-experience, sour-experience, and lemonade-experience might be mutually irreducible. But while I cannot demonstrate that these examples either do or do not involve phenomenal blending, it is enough that it be epistemically possible that phenomenal blending is metaphysically possible.

6 From limited blending to ubiquitous blending

There remains only the problem that there do not appear to be any known qualities that could plausibly serve as ingredients for *all* our qualities in the way that, say, redness and whiteness serve as ingredients for pinkness. McGinn expresses this concern when he writes that:

> We cannot [. . .] envisage a small number of experiential primitives yielding a rich variety of phenomenologies . . . [for] you cannot derive one sort of experience form another: you cannot get pains from experiences of colours, or emotions from thoughts, or thoughts from acts of will. (McGinn 2006, p. 96)

McGinn is right that we cannot reasonably hope to get all qualities from any small set of known qualities, but the defender of blending need not think that the basic ingredients are known to us. Instead, the basic ingredients may be 'alien', unimaginable but not inconceivable. It is commonplace that there are such qualities: just as a human born anosmic cannot imagine olfactory qualities, we are all similarly limited regarding the qualities of the many sensory modalities that humans lack. We can accept the existence of such qualities, but we cannot 'know what they are like'.

Presumably, if familiar qualities can blend, so can alien ones. But can they blend *into familiar qualities?* For instance, might the familiar phenomenal quality of redness be a blend of two alien phenomenal qualities (call them AQ1 and AQ2)? If so, maybe all our phenomenal qualities result from blending, even when we cannot identify their ingredients.

However, AQ1 and AQ2 cannot be unimaginable in exactly the same way as standard examples, involving, say, tetrachromatic vision, or bat sonar. Our inability to imagine the latter corresponds to our inability to experience them. We *lack something*, phenomenologically speaking. But we *do* experience AQ1 and AQ2, whenever we have experiences of red: we *lack* nothing. How, then, can they be unimaginable?

In one sense, we *can* imagine AQ1 and AQ2, just by imagining redness. But when we do so, we cannot *separate* AQ1 from AQ2. They are imaginable together, but not

distinctly imaginable. We do not know what they feel like on their own—not because we lack necessary resources, but because we cannot deploy one resource without also deploying another. Call this 'unimaginability by surplus'; it contrasts with the standard examples of 'unimaginability by lack'.

For a more mundane example of unimaginability by surplus, consider an arachnophobe trying to imagine how their friend, who finds large furry spider adorable, perceives a tarantula. This imaginative task may be impossible for them, but not because they lack anything. They can imagine spiders, they can imagine finding something cute, and they can connect these imaginings together. The problem is that they cannot generate an image of a spider without *also* generating a feeling of intense fear and revulsion, which would constitute failure to imagine their friend's experience.[8]

Even accepting the possibility of both phenomenal blending and unimaginability by surplus, it may still seem that the different qualities we experience are too radically heterogeneous to be blends of the same ingredients.[9] But our ability to recognize two things as akin to one another often depends on our ability to recognize and attend to the features they share, and if we cannot pick out their shared features we may wrongly feel that they are entirely unlike; musical and taste training provide many examples. Hence if we cannot distinctly experience the basic ingredients, we may consequently be unable to recognize or attend to them, and thus get a false impression of radical heterogeneity.

Inability to pick out shared features does not always stop us registering similarities. Sometimes we feel that two things 'seem alike' in some way, without being able to say how; whether a particular shared feature generates such an intuition may depend on subtle details of our information processing. And this kind of inarticulate resemblance is very commonly encountered among experiential qualities: we frequently describe qualities of one modality using terms drawn from another (warm, harsh, sweet, soft, loud, etc.), or use sensory terminology to describe emotional or cognitive phenomenology. The defender of the small-palette hypothesis can say that the resemblances among qualities fall into three types: those we can articulate by identifying the common element (e.g., the negative valence in a pain and an itch, or the redness in orange and purple), those we cannot articulate but nevertheless vaguely intuit (e.g., between redness and warmth), and those we do not register as similarities at all because we cannot imagine the shared ingredients distinctly.[10]

I conclude that there remains no principled objection to the small-palette hypothesis.[11]

7 What is the right relation?

The small-palette hypothesis mentions 'the right relation to blend'; while defending the hypothesis does not required specifying this relation, such an absence makes it less satisfying, so I will briefly suggest a candidate specification. First note that phenomenal unity definitely seems like a pre-requisite; it would be hard to experience two qualities as a single quality, if they were not 'experienced together'. But clearly more is required.

Consider colors. If redness and whiteness are experienced at two different points in the visual field, there is no experience of pinkness. To blend they must stand in the relation 'experienced-in-the-same-location-as'. We might try to generalize this relation beyond the visual case, by saying that blending occurs when the same *object* is being represented—the same part of the visual field, the same point on the skin's surface, etc.

Blending also seems to occur in those aspects of experience which do not distinguish multiple objects: sense-modalities like smell which encode very little spatial information, and affective phenomena like mood. It seems characteristic of odors and moods to merge and interpenetrate rather than being compartmentalized. In fact, this follows from the definition of 'seamless' blending: if we experienced the qualities as qualifying different objects, we could distinguish them by focusing on one object or the other.

Thus I would suggest that blending is the default: it occurs whenever two qualities are unified, but not positively separable. What is hard is not to blend two qualities but to simultaneously instantiate them *without* them blending: this requires the mental infrastructure to ascribe the qualities to specific objects, and then distinguish those objects.

To provide a non-representational characterization, we might speak of causal 'quarantining' processes to prevent two mental elements from interacting as fully as they might, as is often thought to occur when we imagine another person's mental state without allowing it to infect, or be infected by, our own mental state.[12] Structures like the visual field might be partly constituted by systematic relations of mutual quarantining.

Call this the 'Blending-As-Default' extension of the small-palette hypothesis. It claims that the negative part of the definition of seamless blending (inability to distinguish), together with phenomenal unity, is sufficient for the positive phenomenology of two qualities forming a third. It need not be adopted, but it has some plausibility, and is attractively straightforward.

8 Conclusions

Once we recognize that the basic shades on our palette need not be (distinctly) imaginable by us, and see that James's argument against phenomenal blending is either fallacious or does not preclude blending in general, small-palette solutions to the palette problem become perfectly reasonable options. There may be other reasons to reject panpsychism or other forms of identity theory, but this particular one should not move us.

Acknowledgements

Notes

1 For discussion of the palette problem (also sometimes referred to as the blending problem or the derivation problem), see Chalmers 1996, p. 306, Chalmers Forthcoming, Goff 2006, p. 57, Coleman 2012, p. 144 and Forthcoming pp. 40–51, Alter and Nagasawa 2012, p. 5, Dainton 2011, p. 246, Lewtas Forthcoming, pp. 54–55.

2 For examples of philosophers endorsing something like what I call the small-palette hypothesis, see Peirce 1998, pp. 35–36 and Spencer 1899, §60, *inter alia*.

3 How objectionable this 'bloating' is may depend on whether it is seen as a matter of quantitative parsimony (number of existents) or qualitative parsimony (number of basic types). Basic phenomenal qualities are mutually irreducible properties (and thus multiply-instantiable universals, rather than particulars), but might be thought sufficiently akin to one another that they form a single basic type. In the latter case they would offend only against quantitative parsimony, which many consider less important.

4 Schilder and Stengel 1931, Ploner et al. 1999, Grahek 2007.

5 Basile's central concern is whether it is coherent for a single quality to be experienced simultaneously by two different subjects, one a part of the other. I address this question directly in other work, but it is separate from the question of blending, which involves only a single subject.

6 Does this threaten mind-brain isomorphism? No, if these changes to phenomenal character mirror the physical changes one neurone causes electrically in another. Is it problematic that this replaces one quality with another, but does not replace a neurone with another? No; isomorphism demands merely that some fine-grained physical property or event be replaced with another.

7 Similar remarks apply to the apparent truism that nothing can display two colors at once to the same observer—nothing could both look red and look white at once. In one sense of 'look red' and 'look white', nothing can do both, but this is because to 'look red' in this sense definitionally precludes displaying any other visual qualities. But in another sense, looking both red and white might just be 'looking pink'. Pink things look red, but unlike the things we tend to call 'red-looking' (in the holistic sense), they also look white.

8 The arachnophobe's imaginative inability is 'shallow', i.e., the right sequence of experiences could let them imagine a spider without feeling fear. By contrast, alien qualities are 'robustly' unimaginable: only a profound transformation, possibly requiring gross physiological reorganization, would let human distinctly imagine AQ1 or AQ2.

9 I thank an anonymous referee for pressing me on this point.

10 For an extensive discussion of the kinships we can recognize between qualities in different modalities, see Coleman Forthcoming, pp. 43–47, drawing on Hartshorne 1934, pp. 35ff. Cf. Pierce 1998, p. 35.

11 Is this hypothesis now objectionably 'mysterious', in postulating that the qualities we can (distinctly) imagine are minority of the experiences we actually have? Certainly, without further detail it is less an explanatory *achievement* than a postulate that things are in principle explainable. But it is acceptable for a theory of consciousness to postulate many unimaginable things. *Inconceivable* postulates are objectionable, since they undermine the theory as an idea. But unimaginable postulates only undermine the theory as an image, and theories need not be images. Those who accept the irreducibility of subjective experience to the objective and public should already be committed to a vast range of unimaginable experiences.

12 Cf. Goldman 2008, Gallese et al. 2004.

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