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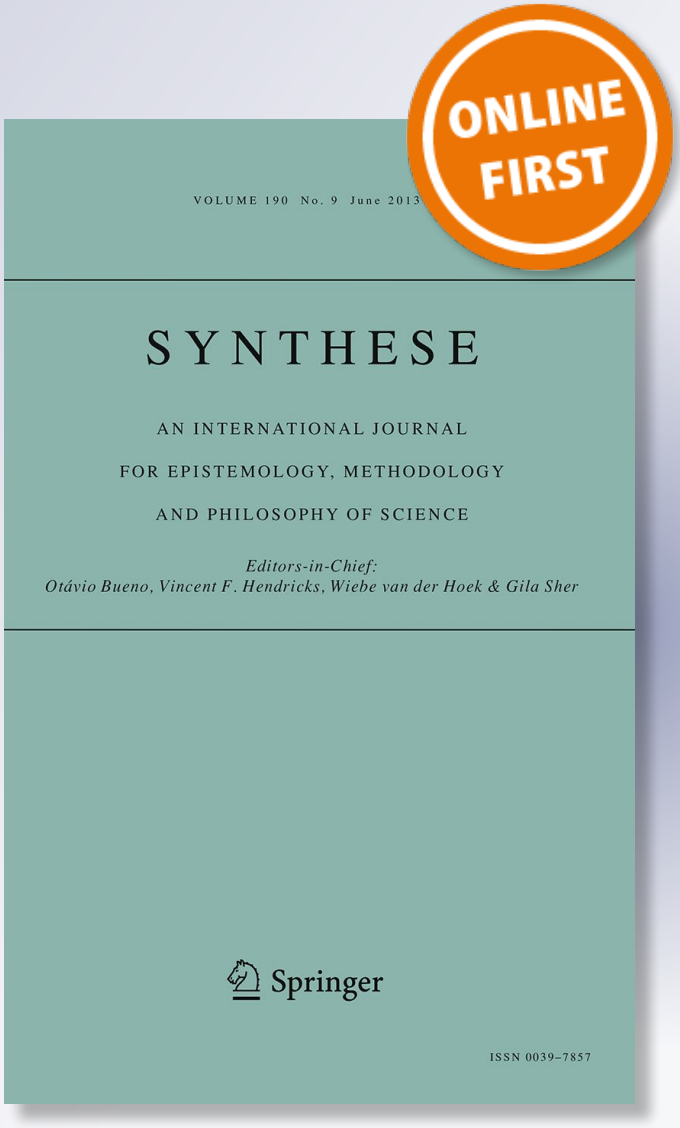

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S.I.: NEUROSCIENCE AND ITS PHILOSOPHY

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Abstract Intermodal representationalism is a popular theory of consciousness. This paper argues that intermodal representationalism is false, or at least likely so. The argument turns on two forms of exceptional episodic memory: hyperthymesia and prodigious visual memory in savant syndrome. Emerging from this argument is a broader lesson about the relationship between memory and perception; that it may be possible to entertain in memory the very same content as in a corresponding perceptual experience, and that the 'overflow' interpretation of the classic Sperling paradigm experiments may not fully generalize.

Keywords Consciousness · Episodic memory · Representationalism · Hyperthymesia · Savant syndrome · Richness · Fineness of grain

1 Representationalism and intelligibility

The phenomenal character of conscious experience is what it is like for a subject to have an experience. The representational content of an experience is what that experience represents. What is the relationship between the phenomenal character of an experience and that experience's representational content? One answer is offered by *representationalism*. In its most classic expression, the view can be framed in terms of supervenience: necessarily, for any two experiences E and E*, if E and E* are alike in their representational content, then E and E* are alike in their phenomenal character. I will understand this supervenience claim as coming without a restriction to pairs of states of the same kind (i.e. E and E* need not be of the same modality)

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and without restriction to a certain time-interval (i.e. that a subject undergo E and E* sequentially). So the version of representationalism I am interested in is *intermodal*, *time-unrestricted* representationalism. But I will just call this 'representationalism' for short.[1]

I think we have reason to believe that representationalism is false. My case begins with the following assumption:

INTELLIGIBILITY If two experiences E and E* differ in phenomenal character, then there will be some representational difference between E and E* that renders their phenomenal difference intelligible

Standard (purported) counterexamples to representationalism consist in two experiences that are (purportedly) identical in representational content, but differ in phenomenal character. If INTELLIGIBILITY is true, this strategy is not necessary. For now what matters is the presence of *explanatory* representational differences—representational differences that renders the phenomenological difference between E and E* intelligible. This has two immediate consequences. First, when faced with a potential counterexample, the representationalist cannot respond by adducing *just any* representational difference between E and E*. Second, and relatedly, the anti-representationalist need not ensure that there is *no* representational difference between E and E*; all she needs to show is that the difference, if there is one, is not an explanatory difference.[2]

The 'intelligible' in INTELLIGIBILITY and related talk of 'explanatory differences' might make some balk. It shouldn't. Suppose Rocco has a visual experience (E) with a reddish phenomenal character and then later has a distinct visual experience (E*) with a greenish phenomenal character. If representationalism is true, there will be some representational difference between E and E*. All a commitment to INTELLIGIBILITY adds is this: there will be some specific representational difference between E and E* that has, in an intuitive sense, *something to do with* the phenomenal difference between E and E*. E's representing *that Carmichael is chipper* and E*'s representing *that Carmichael is languid* has no bearing on E having a reddish phenomenal character and E* having a greenish phenomenal character. But suppose it is suggested that E and E* differ in phenomenal character because E represents surface spectral reflectance property R and E* represents surface spectral reflectance property G. Already that's more plausible, and you don't need to be a color physicalist to see why.

[1] For these distinctions, see Speaks (2015: pp. 22–23). There are many versions of representationalism: see, e.g., Harman (1990), Dretske (1995, 2003), Tye (1995, 2000, 2009), Lycan (1996), Byrne (2001), Crane (2003), Chalmers (2004), Jackson (2006), Pautz (2007), Bourget (2010, 2017a), Speaks (2015), and Schellenberg (2017). Intermodal representationalists include Dretske, Tye and Bourget. (Dretske and Tye ultimately ascribe to a stronger thesis about the relationship between phenomenal character and representational content, but their views entail the supervenience claim. Bourget identifies phenomenal states with non-derived representational states.) Lycan and Crane are *intramodal* representationalists.

[2] This constraint, along with the use of the term 'intelligibility,' comes from Wayne Wu (2014: p. 132). But as far as I can tell, it has never been explicitly leveraged as a strategy for arguing against representationalism.

The relevant notion of explanation in INTELLIGIBILITY, then, is rather thin. It does not require that phenomenal differences are a priori derivable from representational differences. Satisfying INTELLIGIBILITY is consistent with there being an explanatory gap between phenomenal facts and representational facts. And it is broad by design: by simply requiring that the representationalist point to a representational difference that has to do with the phenomenal difference, it puts her in the driver's seat dialectically. So while the representationalist is technically free to reject INTELLIGIBILITY, if she is genuinely interested in explaining phenomenal character, INTELLIGIBILITY will be the least of her theoretical commitments. On the flip side, with INTELLIGIBILITY in play, the anti-representationalist is free to concentrate only on those putative representational differences that are potentially explanatory in the relevant sense, and, if possible, argue that they are not actual differences. As we will see, that is precisely the strategy taken up here.

Here, then, is the argument I want to advance. It turns on two types of exceptional memory: *hyperthymesia* or Highly-Superior Autobiographical Memory (HSAM), and savants with prodigious visual memory. At its most general, the argument goes like this:

F1 If representationalism is true, then two experiences that differ in phenomenal character will have some representational difference that renders their phenomenological difference intelligible.

F2 There is strong evidence that it is psychologically possible for there to be a memory experience (E_M) and a corresponding perceptual experience (E_P) that are different in phenomenal character, but lacking in any representational difference that would render their phenomenological difference intelligible.[3]

$\therefore$ We have strong evidence that representationalism is false.

P1 follows from INTELLIGIBILITY, and so is true by stipulation. So the goal is to defend P2. Neither case—neither HSAM or prodigious savant syndrome—will be conclusive on its own with respect to P2. Although savant syndrome is well studied, some of the details are murky, and (as far as I can tell) the first case of hyperthymesia was documented only 10 years ago (Parker et al. 2006). But when taken together, coupled with further constraints, what emerges is a powerful case against representationalism.

The plan is straightforward. Section 2 is comprised of a somewhat lengthy but necessary preamble. There we will look at some salient general characteristics of memory and perception that will prove essential groundwork for the discussion that follows. In Sect. 3 I defend P2. I wrap up in Sect. 4.

Before we press on, a note about how the present essays fits in with the current literature on representationalism. Purported counterexamples to representationalism have not been in short order over the years. A small sampling includes Peacocke

[3] Psychologically possibility is a species of nomological possibility. Let us say that x's being F is psychologically possible iff there is a possible world W, such that the laws of psychology in W are the same as in the actual world, and x is F in W (cf. Kriegel 2003: p. 275).

(1983), Block (1996, 2010), Nickel (2006), Aydede (2009), and Kind (2013).[4] The present essay, however, is not just another counterexample to representationalism. For one thing, the cases here are quite different from normal fair, as they are culled from rare psychological syndromes.[5] But for another, if the central hypothesis is correct, we also gain insights into the nature of memory itself; that it may be possible to entertain in memory the very same content as a corresponding perceptual experience, and that the 'overflow' interpretation of the classic Sperling paradigm experiments may not fully generalize.

2 Perception and episodic memory

Built into P2 is the claim that there are *memory experiences*. 'Memory' labels a varied set of mental capacities. The exercising of many of these capacities, however, do not plausibly count as, or otherwise involve, experience. For instance, there need not be anything it is like to remember how to play the saxophone (as in *procedural memory*), or to remember that the old Yankee stadium was at East 161st Street and River Avenue in the South Bronx (as in *propositional memory*).

A much more plausible candidate is *episodic memory*. This can be born out nicely by example. Suppose you attend a 4th of July fireworks celebration on the beach. Suppose further that it is a particularly fantastic fireworks celebration. A week later, for no discernible reason, you recall your experience of the fireworks. You, in some sense, revive your past experience. And in doing so, there is something it is like for you. There is something it is like for you to recall seeing the fireworks on the beach. Or, to borrow an example from Owens (1996: p. 320), suppose you attend the Mardi Gras parade in New Orleans. Later you are asked how many floats were at the parade. You do not know off the top of your head, so you must reflect on what the parade was like, conjuring a mental image of the scene as you experienced it (*ibid*). This allows you to learn something new about the past, just as perception enables you to learn something about the present.

I will focus exclusively on episodic memory going forward, moving freely between 'episodic remembering,' 'experiential recall,' and 'memory experience.' The claim implicit in P2, then, is this: occurrent episodic rememberings are *experiential states*. In other words, when a subject S remembers φ'ing x, where 'φ'ing' picks out a

[4] It's not clear to me how to assess many of these alleged counterexamples. Emblematic of the problem are *phosphenes*. Block (1996) contends that phosphene experiences do not represent anything. Perhaps. But the problem is that there does not seem to be a principled means for settling the issue—that is, a principled means for deciding whether, and what, representational properties are attributable to such experiences. As a result, the ability to assess the representationalist's response is undercut, leaving the debate unprincipled. Gualtiero Piccinini gives voice to this issue when he says that without answers to these questions, it is not even clear what needs to be done to "score points" within the debate. (For discussion by Piccinini, see The Brains Blog. As far as I know, this point has not been made in print.) While I am somewhat optimistic that the cases under consideration here present a methodological advance in at least some respects, I will not defend this point.

[5] An exception is discussions of synesthesia in relationship to representationalism. See, for example, Brogaard (2016).

perceptual verb, there is something it is like for S to remember φ'ing x. Even more simply: episodic memory has a *phenomenal character*.

Now, if the representationalist is willing to grant that episodic memories are experiential, she will grant that they are representational. And that is not controversial anyway. So the real issue is two-fold: (i) what is the phenomenological difference between memory and perception, and (ii) what are the potential representational differences that would render this phenomenological difference intelligible. I will look at (i) next in Sect. 2.1, and then broach (ii) in Sect. 2.2.

2.1 Presentational character

Let the expression 'E_M/E_P pair' pick out a perceptual experience and a corresponding memory of that perceptual experience—i.e. an episode of experientially recalling E_P. The claim to be advanced—a bit dogmatically for now—is this: for any E_M/E_P pair, E_P will have a type of phenomenal character that E_M lacks. I call this type of phenomenal character *presentational character*.

Presentational character is the defining phenomenological feature of perceptual experience. A diverse crowd has recognized this fact.[6] Here is C.D. Broad:

> In its purely phenomenological aspect seeing is […] ostensibly prehensive of the surfaces of distant bodies as coloured and extended. […] It is a natural, if paradoxical, way of speaking to say that seeing seems to "bring one into direct contact with remote objects" and to reveal their shapes and colours. (1952: pp. 32–33)

John Searle:

> If, for example, I see a yellow station wagon in front of me, the experience I have is directly of the object. It doesn't just 'represent' the object, it provides direct access to it. The experience has a kind of directness, immediacy and involuntariness which is not shared by a belief I might have about the object in its absence? The visual experience I will say does not just represent the state of affairs perceived; rather, when satisfied, it gives direct access to it, and in that sense it is a presentation of that state of affairs. (1983: p. 46)

And lastly, M.G.F. Martin:

> [S]ensory states involve a certain immediacy or apparent presence of an object which is simply not required in cases of pure thought. (2002: p. 388)

[6] Presentational character has been discussed frequently in the literature, although not always under the same name. Valberg (1992) simply uses the term "presence." Sturgeon (2000) and Schroer (2012) use "scene-immediacy," Hellie (2007) uses "phenomenal naïveté," Chudnoff (2012) uses "presentational phenomenology," and Millar (2014) uses "phenomenal directness." I have introduced "presentational character" elsewhere (2015), so as to emphasize the phenomenon's status as a kind of phenomenal character. The quotes found below can also be found in Hellie (ibid: 266). For a discussion of presentational character in non-visual perceptual experiences, see Chudnoff (2012).

While visual experience is arguably the paradigmatic case of presentational character, as Martin points out, presentational character can be understood as the phenomenological mark of perceptual experience more generally. Just as the station wagon seems *right there* and available for demonstrative reference when I see it, so too does the garlic when I smell it.

One way to get at the idea is comparatively. Consider the way we you aware of something in visual experience versus conscious thought. Suppose you think about a bejeweled blue Fabergé egg and then later have a visual experience of such an egg. In both cases, you are aware of the egg. Yet the difference is vast. Only in visual experience does the egg seem to be directly before you. And the sense of sense in which the egg's presence is 'direct' is not epistemic; it's phenomenological (Schroer 2012). It's not as I think about the egg indirectly, only by thinking about something else first. The directness is thus of a phenomenological nature. A perceptual experience phenomenally presents its object; it has, in other words, presentational character with respect to its object. Thoughts do not.

It is also important to note that perceptual experience need not be veridical for it to have presentational character. Even if I am hallucinating, it can still seem as if the Fabergé egg is directly before me in a way that it will not when I merely think about it. It is true that I will not be aware of the egg. But that only shows that the more perspicuous way to put the comparison is not in terms of the way I am actually aware of objects, but the way things seems to me, viz. whether or not it seems to me as if the egg is directly before me. This point will come up again as we proceed.

I think episodic memory is more like conscious thought than it is like perception, at least phenomenologically speaking. There is something it is like to remember φ'ing x, but when I remember φ'ing x, I do not seem to be aware of x (or φ'ing x) in the way I would be aware of x if I had perceived it. That is, for any E_M/E_P pair, E_P will phenomenally present x, but E_M will not phenomenally present x. Therefore, E_M and E_P will differ in phenomenal character.

It might be wondered whether the memories of subjects with HSAM and prodigious savant syndrome are exceptional precisely because their episodic memories *do* have presentational character. I think that is wrong, and we will see why in Sect. 3. But for now I propose we just grant the phenomenological difference for episodic memory *simpliciter*.

2.2 Explaining presentational character

If it is true that memory and perception differ in phenomenological character, then given INTELLIGIBILITY, the representationalist will need to point to some relevant difference in representational content between memory and perception. Here I will run through four proposals. I will argue that the first two do not pass muster. This will help us make precise what it takes to meet INTELLIGIBILITY in the present case, and in turn, why the second two candidates do better.

The first begins with the observation that episodic memories are tensed. Episodic memory concerns the past. When we recall something, we are recalling that thing as occurring in the past. Memories have what we might call *past-tense content*. This

gives us the following proposal: (i) for any E_M/E_P pair, the content of E_M will differ in tense from the content of E_P, and (ii) it is because of this difference that E_P has presentational character, but E_M does not.

Now it is not actually entirely uncontroversial that for any E_M/E_P pair, the content of E_M will differ in tense from the content of E_P. Owens again provides us with a nice example:

> Visual input might…affect the tense content of an auditory experience. Suppose an experienced artillery spotter is observing some distant guns through his field glasses. He sees a gun fire and, a second or two later, he hears the report. Might not the tense content of his visual experience influence that of his auditory experience, so that he begins to hear the reports as simultaneous with the flashes he sees through his field glasses? That would be a case of hearing the reports as past events, as events which happen before he hears them. But it would not be a case of recalling the reports: our artillery spotter would have absolutely no inclination to treat this auditory experience as a recollection (1996: p. 322).

If Owens is right, then it seems like we could have an E_M/E_P pair whose members *both* have past-tense content. But even if Owens is not right, INTELLIGIBILITY remains *prima facie* unmet. Consider again my episodically recalling (E_M) seeing a Fabergé egg. When I undergo E_M, does the past-tense 'attach' to my seeing the egg, or the egg itself? If the former, then the present proposal does not meet INTELLIGIBILITY. For what is phenomenally presented in perceptual experience is not your seeing the egg, but the egg and it's various features. The putative representational difference would thus not concern things that are candidates for being phenomenally presented.[7]

This suggests that for the present proposal to meet INTELLIGIBILITY—for E_P's having present-tense content and E_M's having past-tense content to render intelligible why only E_P phenomenally presents the Fabergé egg—tense must be attributed to the perceptual object. One way of making sense of this idea is by appeal to a relational property. We already know that experience can represent various spatial relationships between subject and object. So perhaps the temporal component is just one more relation; in perception, our experiences represent subject and object as standing in a present-oriented temporal relationship, while in memory our experiences represent subject and object as standing in a past-oriented temporal relationship.[8]

I am skeptical that we can make any inference from the fact that experiences represent spatial relations to them representing temporal relations. One difference is that former is introspectively evident, but the latter (at least for my part) is not. When I undergo an episodic memory, I report this by saying (things like) 'I saw the Fabergé egg.' I recollect the egg as being in the past, but this does not mean that the egg is

[7] I am assuming that presentational character is a positive phenomenal feature. If instead the non-presentational character of memory were positive—by virtue of containing a representation of pastness, say—one might then conjecture that the presentational character of perception is just the same as the content of episodic memory minus the representation of pastness. But this is not plausible; perceptual experience is conceptually and psychologically prior to episodic memory. I thank an anonymous referee for raising this point.

[8] I thank an anonymous referee for suggesting this option.

represented as having been in the past, or as standing in some past-tense relation to me. For it is equally true that my *seeing* the egg occurred in the past, and it does not seem as if introspection could settle in this case what is, in fact, represented as being in the past.

We can push the point further. Suppose we grant that the temporal component of memory 'attaches' to the egg, or at least that it seems to. That means that my experience is committal with respect to the egg as having some property F; in this case, *being in the past*. But as Kriegel (2015) points out, this does not mean that F is actually part of the experience's content. My experience committing to the F'ness of x could be a matter of:

(a) My experience representing x as F, where x's being F is part of the experience's content.

Or it could be a matter of:

(b) My experience representing-as-F x, where only x is part of the experience's content.

If tense 'attaches' to perceptual objects in the vein of (b), the representationalist will not have gained any ground. For then the temporal component of memory would be a matter of *how* something is represented in memory, not *what* is represented. The temporal orientation would be, to use Kriegel's (*ibid*) expression, "attitudinally encoded."[9]

This is not the place for a defense of (b) in lieu of (a) for temporal orientation.[10] My reason for belaboring this point is only to make clear that, while temporal orientation is one of the most distinctive features of episodic memory, it is not obviously the best for the representationalist to hang her hat on.

But there is a more basic point that, I think, sinks the proposal. The idea in effect says this: E_P's representing that x is in the present (or something like that) is sufficient for E_P's having presentational character. If that were true, our thoughts would have presentational character too, for I can *think* that the Fabergé egg is in the present. Yet *ex hypothesi* they do not. Thus while it might be right that my E_M does not represent its objects as being in the present, this story could not help with explaining why perception *has* presentational character.[11]

[9] This would not be a problem for intramodal representationalists, of course. But our concern is with intermodal representationalists. Recall Sect. 1.

[10] That said, Kriegel (*ibid*) argues that a (b)-treatment of temporal orientation is the best way to resolve the tension between our A-theoretic temporal phenomenology of episodic remembering with a B-theoretic metaphysics without implying an error theory. Others too have denied that the temporal aspect of episodic memory is a feature of its content for different reasons. See, e.g. Michaelian (2016).

[11] The same point holds for a nearby proposal, also suggested to me by an anonymous referee: (i) for any E_M/E_P pair, while E_P will represent it's object as being in one's environment, E_M will not, and (ii) it is because of this difference that E_P has presentational character, but E_M does not. For one thing, it is hardly clear that perception even represents such a relational property, since it is hardly clear that perception has anything beyond 'low-level' content. The property of *being in one's environment* is not a kind property or a semantic property, but it is not a low-level property either. (For discussion, see Hawley and Macpherson 2011.) But again: we can have the *thought* that the Fabergé egg is before me in my environment, yet that thought won't have presentational character. So, once again, while it might be right that memory does not represent its objects as being in the current environment, this story could not help with explaining why perception has presentational character.

So much for the first proposal. The second proposal is this: (i) for any E_M/E_P pair, while E_P will represent some environmental object and its properties, E_M will represent your perceiving (seeing, hearing, etc.) that object and it's properties, and (ii) it is because of this difference that E_P has presentational character, but E_M does not. This represents a fairly common way of cashing out the content of memory: it will include the content of the original perceptual experience as a proper part (Martin 2001: p. 738; cf. Fernández 2006). You do not just remember your seeing the Fabergé egg. You remember things about the Fabergé egg you saw: it's shape, it's color, and so on. But this proposal makes it utterly mysterious why memory does *not* have presentational character. The only difference in content between your perceiving the egg and remembering is that the content of the latter has an *additional* feature, viz. that it represents your seeing the egg. That only makes the question of why things like the egg and it's features are not phenomenally presented in episodic memory all the more acute.

Thus neither of these proposals cut it. That's the bad news. The good news is that they point the way forward. To meet INTELLIGIBILITY for presentational character, the representational difference between E_M and E_P must concern those things that are actually phenomenally presented: sensible properties. When I see the Fabergé egg, what is phenomenally presented—what seems directly before me—is the egg and its various features. These features include its color, size, and shape. So when the representationalist is pressed to explain why it is that perceptual experiences have presentational character but episodic memories do not, they need to point to some representational difference that holds with respect to such properties.

This fits nicely with a point noted earlier, viz. that hallucinatory perceptual experiences have presentational character too. That suggests—and absent an appeal to sense data, perhaps entails—that it must be the representation of properties that fixes phenomenal character generally. And as it happens, that's precisely what many representationalists say (e.g. Dretske 1995; Pautz 2007; Tye 2009, 2014; Schellenberg 2017).[12] When it comes to *presentational* character, I am claiming that the representationalist ought to focus on a certain sub-class of properties, viz. those like color,

[12] It is not simply introspective evidence that suggests that non-veridical perceptual experiences have presentational character; it arguably falls out of the *common kind claim* as well, another frequent commitment of representationalism. One way to cash this out is to say that the very same properties that are represented in veridical experience are represented in non-veridical experience. The difference is that in non-veridical experience the properties are uninstantiated. (Whether we are also aware of these uninstantiated properties is a further matter. Dretske (1995: p. 102) and Tye (2018) say 'yes'; Pautz (2007) says 'no'.)

size, and shape.[13] Specifically, the representationalist ought to focus on the *extent to which* these properties are represented, or the *grain* of these represented properties. I can represent sensible properties in thought, and I can represent them in memory, but perhaps not in the way I can in perception. Analogous questions do not come up for properties like *being in the past* or *being in one's environment*. You either represent them, or you do not.

In light of all this, the representationalist has two resources. The first begins with the observation that perceptual experience (and especially visual experience) is representationally rich. The primary source of evidence for this claim comes from George Sperling's (1960) influential partial-report experimental paradigm (cf. Tye 2006; Block 2011). The basic set up goes like this. Subjects are presented with a 3×4 array of letters, flashed briefly on a screen. It was clear that subjects could only report on a subset of the letters presented to them, despite the fact that they claim to see more than they can report. But Sperling wanted to know if this has any implications for memory. In particular, Sperling wanted to determine whether the informational capacity for visual experience was connected to the capacity for memory. The trick was to move from total report to partial report: rather than attempting to report on everything that was seen, subjects would report on only part of what was seen, as determined by task instruction. When asked to report on all the letters, subjects were able to report on average 4.3 letters (1960: 1). When using a tone after the array ceased to be visually present to indicate (randomly) which line of the array subjects were to report, however, subjects were able to report on average 9.1 letters—about three per line *(ibid*: 6).

Sperling's idea was that there must be a kind of 'sensory memory store'—referred to as iconic memory by Neisser (1967)—encoding information about almost all the letters which endures for around 300 ms. This, evidently, is enough time for the cue to determine which letters are sent to a smaller, yet longer-lasting, form of memory from which reports are made (Phillips 2011: p. 384). This form of memory is *visual working memory*, which is the "leading edge" of long-term memory, and as such, episodic memory. The purported upshot is not only that our capacity to remember is less than our visual capacity, but that iconic memory reflects conscious perception. So whereas the content of visual working memory is sparse, the content of visual perceptual experience is *rich*. This interpretation is called the *overflow thesis*. As Block puts it, "conscious perceptual system has rich contents that 'overflows'—that

[13] None of this deny that the representationalist can appeal to the representation of other sorts of properties in their account of phenomenal character. We briefly noted relational properties, like spatial relations. Although differences in the representation of spatial relations can make a phenomenal difference, what matters is whether such differences have any bearing on *presentational* phenomenal character. Imagine two experiences E and E*: E represents a tree as being to the left of me, and E* represents a tree as being to the right of me. Because of this, we can suppose that E and E* will differ in phenomenal character. They will differ in what they are like for a subject to undergo them. However, there will be no difference in presentational character, which is consistent with there being a difference in phenomenal character overall, since an experience can have a phenomenal character that is not entirely presentational. The tree will not seem any less (or any more) directly before me in the sense articulated earlier. More generally, if these relational properties were phenomenally presented in experience, the presentational characters of E and E* would be different; different relational properties presented, different presentational characters. (True, exactly *where* the tree will be presented as being will be different. But that's beside the point.)

is, has a higher capacity than—the sparse system that cognitively accesses perception" (2011: p. 567).

Naturally, this interpretation is not without its distractors (e.g. Phillips 2011). Nor does it obviously apply to complex natural scenes (Irvine 2012), or non-visual perceptual experiences. This latter point is especially important, since presentational character is a feature of perceptual experience in all sense-modalities. But let us put all of that aside. Here is our third proposal: (i) for any E_M/E_P pair, E_M will have content that is far less representationally rich than the content of E_P, and (ii) it is because of this difference in representational richness that E_P has presentational character, but E_M does not. Call this *the richness proposal*.

The richness proposal meets INTELLIGIBILITY. For now we are concerned with what is actually phenomenally presented.[14] If perceptual content by its very nature provides us with more information about the sensible features of the fireworks or the Fabergé egg, then one might think this fact explains why they can be phenomenally presented in perception, but not in memory.

That's the first resource. Here's the second. It is commonly said that there is a fineness of grain to perceptual experience (e.g. Peacocke 1992; Tye 2006). The basic idea is that perceptual experiences represent the world with a level of determinacy that outruns the concepts we possess. If the content of a perceptual experience is fine-grained, then the subject of that experience need not possess the concepts used in the specification of its correctness conditions.[15]

Fineness of grain is occasionally lumped together with richness. But as Tye (*ibid*: 519) makes clear, richness does not entail fineness of grain, nor vice versa. Sperling's experiment supports richness. But visual experiences could be rich without having non-conceptual content. Richness is about the extent to which details are represented in experiences. Those details, though, could be represented conceptually (Tye, *ibid*).

So, richness and fineness of grain are distinct properties and thus can serve as the basis of distinct proposals. Thus we have our fourth and final proposal: (i) for any E_M/E_P pair, E_M will less fine-grained (i.e. E_M will represent at a lower level of determinacy) than E_P, and (ii) it is because of this difference in grain that E_P has presentational character, but E_M does not. Call this *the fineness of grain proposal*.

The fineness of grain proposal meets INTELLIGIBILITY. The proposal concerns the grain of those very sensible properties the Fabergé egg is represented as having—i.e. those very properties that are candidates for being phenomenally presented. Moreover, Bourget (2017b) has recently given an ingenious argument that it is psychologically *impossible* for the members of any E_M/E_P pair to be equally fine-grained.[16]

[14] Schroer (2012) briefly discusses this line, albeit without endorsing it.

[15] Many thanks to an anonymous referee for pushing me to explore this option more.

[16] Technically, Bourget does not use the expression 'presentational character,' and his focus is on what he calls 'imagery' and 'cognitive' experience as opposed to episodic memory experience. The former issue can be set aside, since I think the distinction Bourget does talk about—experiences with 'vivid' phenomenal character compared to those with 'faint' phenomenal character—can be assumed to map on to presentational versus non-presentational distinction. The latter issue, however, deserves further discussion. For more, see Sect. 3.3.

To defend P2, then, we need to examine both the richness and fineness of grain proposals. So let's do that now.

3 Defending premise two

I'll proceed in three steps. The first two cover the richness proposal; Sect. 3.1 examines HSAM with respect to the richness proposal, while Sect. 3.2 examines savants with prodigious visual memory, specifically artistic savants. As a test case, I will focus on one subject made particularly famous in part by Oliver Sacks (1996), viz. the British artist Stephen Wiltshire. I will contend that even if perception and memory almost always differ in richness, they need not: subjects with HSAM and savants with prodigious visual memory are a likely exception. The third and final step, in Sect. 3.3, covers the fineness of grain proposal. Here I do two things. First, I will argue that Bourget's argument fails. This leaves open the possibility that, for some other reason, there are no E_M/E_P pairs whose members are equally fine-grained.[17] So, in the second step, I will examine the implications of prodigious visual memory for the fineness of grain proposal, arguing that they provide evidence that there are indeed possible E_M/E_P pairs whose members are equally fine-grained.

Finally, a reminder: neither HSAM or prodigious visual memory conclusively show that either the richness or fineness of grain proposal fails, and so neither conclusively show that P2 is true. That said, we can further strengthen the case for P2 by constraining the parameters under which the relevant E_M/E_P pairs occur in subjects with HSAM and artistic prodigious savants. Here are the two constraints I have in mind:

C1 *Emotional Salience*: The E_P of the relevant E_M/E_P pair is a perceptual experience of an emotionally (either positive or negatively) salient event

C2 *Time*: The time between the occurrence of E_P and E_M is relatively short

On C1: there is significant evidence that emotionally charged experiences are better remembered than emotionally-neutral experiences (see, e.g. McGaugh 2013). This makes intuitive sense. I am more likely to remember what it was like to watch the Moon landing on TV, or when my dog died, than what my unremarkable lunch tasted like on some unremarkable day in October 1989.[18] On C2: it is a truism about episodic memory that we are better at remembering events in our personal past if the event

[17] There is some precedent in the literature for the claim that content of episodic memory is non-conceptual (e.g. Evans 1982; Bernecker 2009; Russell and Hanna 2012). This is relevant for Bourget's thesis if one grants the following conditional: if episodic memory experiences are not fine-grained, they'll have conceptual content. For then, if they do *not* have conceptual content (i.e. if they have non-conceptual content), then by modus tollens, they will be fine-grained. However, Bourget (Bourget 2017a, b: p. 677, fn. 8) seems to be neutral on this conditional, denying that his argument hangs on the conceptualism versus non-conceptualism debate about experiential content. It is not entirely clear to me what justifies Bourget's neutrality—as noted earlier, with Tye (2006), I would have thought that fineness of grain entails non-conceptualism—but I will not contest Bourget's neutrality here. So the issue to be examined in what follows is just the grain of the sensible properties represented in episodic memory.

[18] Anatomically, there is robust evidence that stress hormones (like epinephrine and cortisone) associated with emotional stimulation play a role—mediated by the amygdala—on the regulation of long-term memory formation (McGaugh 2013).

occurred closer to the present, i.e. closer to the time at which the subject is remembering (undergoing E_M) that event.

So the full-dress version of the claim I am making is this: if we constrain the parameters under which the relevant E_M/E_P pairs occur such that C1 and C2 are met, HSAM and artistic prodigious savants provide strong, even if still not conclusive, evidence for P2. They should, that is, substantially raise our credence in P2. And they do this by providing strong evidence that both the richness and fineness of grain proposals fail.[19]

3.1 The richness proposal: hyperthymesia

Hyperthymesia or Highly Superior Autobiographical Memory (HSAM), is a rare condition characterized by the incredibly accurate recall of past events—a recall that is a dominant, and almost uncontrollable feature of one's life, and thus not dependent on mnemonic or other similar rehearsal strategies. Autobiographical memory accounts for general knowledge of one's life history, including semantic memory for facts about oneself (Markowitsch and Welzer 2010). So while episodic memory is not autobiographical memory, it is also standardly taken to be part of autobiographical memory (Conway 2005; Michaelian 2016). Thus, when discussing HSAM going forward, our focus will be on the enhanced abilities corresponding to episodic memory in particular. For this reason, AJ—the first (and arguably most famous) case of HSAM—provides at best weak evidence for P2, as her superiority is much for striking for semantic autobiographical memory than it is for episodic autobiographical memory (Parker et al. 2006: p. 48).

A better case is HK.[20] HK is a 20-year old man with HSAM. He is also completely blind, having suffered from severe retinopathy of prematurity, being born at 27 weeks. So our focus will have to be on E_M/E_P pairs in which E_P is a non-visual experience.[21]

HK describes how he "is able to relive memories in his mind just as they happened," and that "everything about his memory, including sounds, smells, and emotions, are vividly re-experienced when he remembers a particular event in time" (Ally et al. 2013: p. 171). HK's memory has two salient features: its specificity and its accuracy. HK's memory reports is richly detailed, and those details reflect reality. This has been confirmed experimentally. In a recent study, Ally et al. (*ibid*: 168) collected at least four dates from each year of HK's life, beginning with his first reported memory occurring

[19] It is also worth noting that nothing in this discussion will obviously turn on the metaphysics of episodic remembering. While the *preservative conception* of memory has been popular in the philosophical literature on memory (e.g. Burge 1993; Bernecker 2009), the *constructive conception* predominates in psychology (Michaelian 2016). What follows is neutral on these conceptions. That said, if the preservative view were true, the case for P2 would be rendered somewhat easier. This is because the preservativist's take on memory guarantees that the experiences in our E_M/E_P pair share at least some content (cf. Michaelian, *ibid*: 67).

[20] HK is (as far as I know) only the second single-case study of HSAM, after AJ. But while the study of HSAM is new territory, it is relatively fertile. Since AJ and HK, there have been numerous additional confirmed cases of HSAM. Leport et al (2012) have recently developed a screening process in which they identified ten new HSAM subjects (in addition to AJ and HK) in a single study.

[21] As Ally et al (2013: p. 167) note, despite the lack of visual imagery, patients born blind do not show drastic differences in the quality or detail of their autobiographical memories.

in 1993. Corresponding to each date was a set of (at least) three facts gathered from HK's family and public record. The interview was comprised of 80 dates and was conducted across two sessions, with 10 questions repeated across sessions to help assess consistency in HK's autobiographical memory (*ibid*: 168). Cues were events or event periods that had occurred in HK's life. For instance, one of the (random) cues was, "Can you tell me what happened during your day on March 19th, 2003?" Here is how HK responded, which was typical:

> Well, nothing exciting happened that day. I went to school, then went to therapy at Vanderbilt. Ellen Diamano had me walking on the treadmill and working on my flexibility on this big ball all night. We ate dinner in the Vanderbilt Courtyard Café. I had spinach casserole. That night I watched Everybody Loves Raymond. I was excited because it was the first episode of the new season. I think it was the eighth season. I think there might have also been a report on the news of a suicide bomber in Baghdad. There was a car explosion near the UN (*ibid*: 178).

HK's responses were scored by dividing the number of correct facts given by HK by the number of facts for each event—in the above example, the events of March 19th, 2003. Critically, Ally et al. controlled for the semantic and episodic contributions to HK's autobiographical memory by using a questionnaire based on the *Autobiographical Memory Interview*, or AMI (*ibid*: 168). The AMI makes a distinction between what Levine et al. (2002: p. 679) call *internal details* and *external details*. While external details reflect semantic memory, internal details are meant to reflect episodic memory, since they concern those aspects which are unique to the event being recalled by the subject and were specific to time and place. See Fig. 1.

HK's episodic autobiographical memory is remarkable in terms of its accuracy and its specificity. From ages 20–15, HK scored on 100% the AMI, with 90% of those correct responses concerning episodic details. HK's accuracy dropped a bit for the 9–14 age bracket (along with the proportion of episodic details to overall details, resting at 75%), but it is at age 11 where his accuracy makes a noticeable jump from previous years, hitting 90%—a score from which HK would never drop below (Ally et al. 2013: pp. 170–171).

When thinking about how these scores reflect the detail of HK's memories relative to his initial perceptual experiences, keep in mind that the *full* measure of the former should not be read off any single report made by HK.[22] Single reports are a function of particular prompts. And depending on the nature of that prompt, HK may only be reporting one component of his memory's content. So a better snapshot of the entirety of that content would be given by looking at all the reports HK makes about a particular perceptual event. In fact, that might not cover it either, since there are surely aspects of HK's perceptual experiences that he could accurately report on if suitably prompted. And, at least within certain limits, we can get a glimpse of what else he might remember given what he explicitly claims to remember. For instance, if HK can accurately report that his dinner on an August evening in 2002 was spicy, he plausibly could accurately report on whether it was sweet as well.

[22] I thank an anonymous referee for a query that made it necessary to make this point explicit.

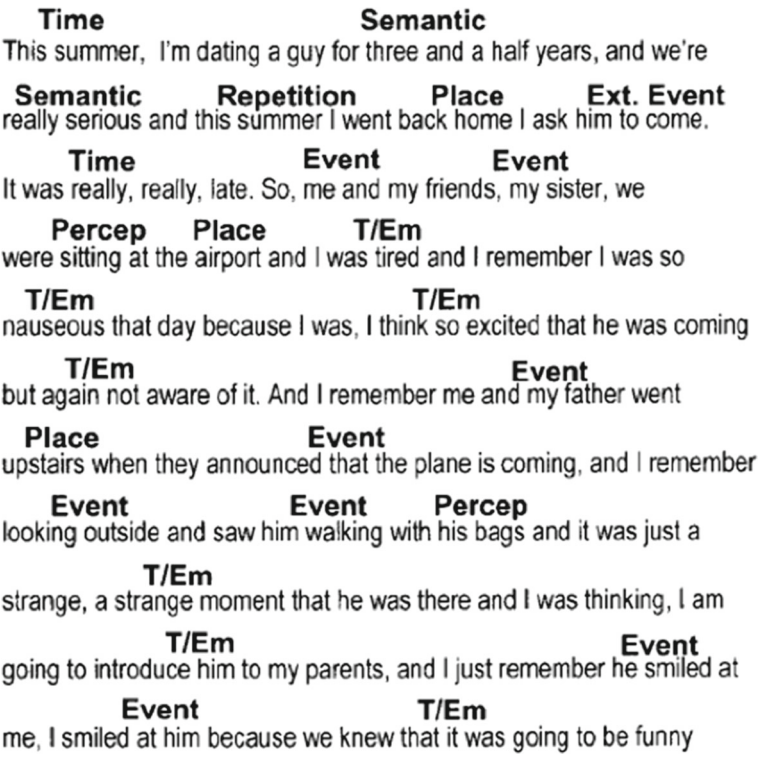

Fig. 1 A sample autobiographical memory protocol. The main event queried was the subject's meeting his/her boyfriend at the airport. Internal detail categories were**: event, place, time, perception** (percep), and **thought/emotion** (T/Em). External details categories were: **External** (Ext.) **Event, semantic, and repetitions**. Originally from Levine et al. (2002: p. 681). Reprinted with kind permission from the *American Psychological Association*

Now we saw that to defend P2, we need to provide evidence for the claim that:

P2*R* There is a psychologically possible E_M/E_P pair whose members differ in phenomenal character but are identical in their representational richness.

Defending P2 requires defending P2*R* given INTELLIGIBILITY and our analysis of presentational character in terms of richness.

With these details before us, here is the argument for P2*R* from HSAM:

P2*Ra* Subjects with HSAM (e.g. HK) can report on their perceptual experience with remarkable specificity and accuracy.

P2*Rb* That subjects with HSAM (e.g. HK) can report on their perceptual experience with remarkable specificity and accuracy is evidence that they can have memories that are just as representationally rich as their perceptual experiences.

So, we have evidence that:

P2*R* There is a psychologically possible E_M/E_P pair whose members differ in phenomenal character but are identical in their representational richness.

We already saw that P2*Ra* is true. What needs defending is P2*Rb*.

The defense of P2*Rb* begins with the following assumption: attributing perceptual states with representational content to subjects helps explain and predict their behavior (e.g. Fodor 1987: pp. 8–9; Marr 1982: p. 10). For example, if, upon facing a tiger, Carmichael suddenly hightails it in the opposite direction, we can explain Carmichael's behavior by saying he is in a mental state (e.g. a visual state) that represents a tiger. It is (at least in large part) because Carmichael is a state with a certain content that he runs for the hills. Call this *the behavior-representation connection*. This assumption—that it is often useful, if not necessary, to regard some of a system's states as representing features of the world when attempting to account for the system's action—strikes me has highly defensible, and in any event is independently plausible as a methodological principle in the present case. The aim here is to assess the representational properties of experiences had by unique subjects. These are experiences we don't have. They are experiences we cannot introspect. As such, behavioral evidence is a plausible way to gain insight into what these experiences represent.[23]

Let us suppose now that HK recalls hearing fireworks at last year's Fourth of July celebration. Suppose further that C1 and C1 are in place, so that the already remarkable accuracy and specificity of his recall is enhanced even further.[24] The behavior-representation then points us towards two questions. The first is this: is the best explanation of the HK's HSAM-related behavior that he is in some representational state or other? The second, by contrast, is this: assuming a 'yes' answer to the first question, *which* representational state ought we attribute to HK to best explain his HSAM-related behavior?

As regards the first question, no one is going to doubt that in order to explain HK's ability to report on his perceptual experiences with remarkable specificity and accuracy, we need to attribute to HK a representational state. It is the second question, however, that has direct bite when it comes to P2*Rb*. For it seems that, in order to account for HK's ability to report on his perceptual experiences with such remarkable specificity and accuracy, we need to attribute to him a highly specific representational state, viz. a E_M with a content that provides HK with *nearly as much information* about the fireworks as does the content of the corresponding E_P. To see why, suppose for reductio that HK were not in that state, but instead some other state. Call it E_M*. Like E_M, E_M* is a memory of HK's E_P of the fireworks. Unlike E_M, E_M* has sparse

[23] The behavior-representation connection has nothing to do with behaviorism. Perhaps it would if it said that the *only* reason we posit representational states is to explain behavior. But it does not say this. It says that this is *one* reason why we do, and that we can, if need be, go some way towards ascertaining the content of representational states by examining the behavior of the subjects that token them. (The behavior-representation connection is also independent of representationalism. One can admit that experiences represent without being a representationalist. For example, Block (1996), a long-standing anti-representationalist, does not deny that experiences represent. He only denies that what they represent exhausts their phenomenal character.) Still, I assume Block would endorse the behavior-representation connection. I thank an anonymous referee for helping me clarify what this principle, does, and does not, say.

[24] On C1: like the rest of us, AJ and HK are better at remembering the more significant events of their daily lives, even if they are unlike the rest of us in the way they remember them (Parker et al 2006). On C2: HK's episodic accuracy was strongly correlated with the time remembered events occurred, with both his highest overall scores (nearly 100%) and highest proportion of episodic to overall details (91%) occurring in the most recent time-period of age 15–20 (Ally et al 2013: pp. 169–170).

content—far sparser, at least, then E_P. So now, when HK reports on his E_P of the fireworks, he is 'drawing on' the far less rich content of E_M*. But if that's so, HK's reports could *not* be highly detailed; there would simply be not be such detail to report on. More generally, the level of specificity in reports about what was perceived reflects the level of richness in the content of memories. Without the latter, it is hard to see how we could get the former. HK's case just makes this point stark.

Note that the behavior-representation connection does not deliver such specific results in all cases. For the sort of behavior you would be able to exhibit is often largely invariant along a wide range of loss in richness between perception and memory. For example, suppose you have a visual experience of a large block. (Think of a block from a child's toy block set.) After 5 min, you close your eyes, and then episodically recall your initial visual experience. Even if your memory did not retain some information on the block's shape or location, I take it that there is still a wide range of behavior that would not be impacted—at least up to a point. You likely would still be able to grab the block or point in its general direction. So, while it is still warranted to attribute to you *some* representational state, precisely which representational state we should attribute is somewhat underdetermined. That is not so when it comes to HK.

'Nearly as much' is, of course, not enough. But again: HK is not meant to be an actual case of identical richness, but evidence of the possibility of identical richness, evidence that is enhanced with C1 and C2 in place. Think about it. The mainline interpretation of the Sperling paradigm experiments suggests that memory is less rich than perception.[25] However, this interpretation requires a proviso: all we know is that memory is less rich than perception *in normal subjects*. Yet HK is not normal. It is an open question, in need of further empirical study, whether there are subjects with more extreme forms of HSAM than that seen in HK. Still, HK should significantly raise our credence in P2*Rb* rather than lower it.

There is an important lingering question, though. It was noted in passing earlier (Sect. 2.1): why think the members of the relevant E_M/E_P pairs actually differ in phenomenal character? If they do not, the argument from HSAM to P2*R* crumbles.

One response is to just dig in one's heels: HK's E_M/E_P pairs *must* have different phenomenal characters, since it is necessarily true that experiences in distinct modalities have distinct phenomenal characters.[26] This is not obviously begging the question. In some ways, the (intermodal) representationalist treats this claim as a background assumption. Seeing something as overhead and hearing something as overhead are phenomenally distinct. That is uncontroversial, and representationalists tend to take it as a given. For example, Tye (1995) handles this case by pointing out that the experiences represent distinct properties beyond the one property (*being overhead*) they both represent: colors in the former, pitch, volume and tone in latter. Dretske employs the same maneuver. Considering a case where blind subjects construct representations of shapes in their environment on the basis of auditory information, Dretske (2000: p.

[25] Of course, if the main interpretation is *false*, then the richness proposal will not work anyway, and we will be already halfway to P2.

[26] Hume (1739: p. 24) can be read as making something like this point when he observes a difference in 'force' and 'vivacity' between perception and memory. Of course, that is only a first pass reading, undoubtedly complicated by various exegetical issues.

458) tells us that it is false to assume that "if S can hear (see, taste, smell) that X is F, if he can know, find out, or discover, in this way that X is F, then S must be hearing (seeing, tasting, smelling) the F-ness of X." In other words, the response is not to say that what it is like to hear for such subjects is akin to what it is like to see or touch. No. The response, at least for the representationalist, is to distinguish between (i) the information a subject can deduce about shapes *from* what is auditorily represented, and (ii) whether that shape information is *itself* auditorily represented. We can cleanly deny that (ii) occurs without saying that the blind subject does not learn anything about the shapes (Dretske, *ibid*). Or at least that is the idea.

Admittedly, making note of what representationalists tend to say can only take us so far. It could be pointed out that the exceptionalness of HK and similar cases warrants an exception—an exception that representationalists will be quick to leverage. Maybe, then, exceptional memories like HK's are exceptional precisely because they have presentational character.

Now in a sense this is too quick. Exceptionalness as such cannot be the motivation; we recognize exceptional senses of smell, but do not because of this go on to say that it is possible for an olfactory experience to have the same phenomenal character as an experience in a distinct modality. So it must be the confluence of two things: that HK's episodic memories are exceptional, and that, episodic memories, unlike other experiences, in some sense represent perceptual experiences—experiences that, when had separately, have presentational character.

At this point, it is hard to know what to say. We do not have memory experiences like HK. We cannot introspect them. So we cannot extrapolate from our own case of what it is like to recall something. Nonetheless, there are two points that I think tip the balance against HK's memories having the same phenomenal character as his corresponding perceptual experiences.

Suppose we have two experiences of distinct modality types: an experience of the β-type and an experience of the μ-type. Now consider the following principle:

SAME If a subject S undergoes two experiences E (of the β-type) and E* (of the μ-type), E at t_1 and E* at t_2, where E and E* have the same phenomenal character, then S will not be able to tell, unaided by something external to those experiences, whether she is undergoing an experience of the β-type at t_2 or an experience of μ-type at t_2.[27]

I think SAME is plausible. If what it is like for S to undergo E is exactly the same as what it is like for S to undergo E*—if what it is like for S to perceive fireworks is exactly the same as what it is like for S to remember perceiving fireworks—then S will not be able to tell whether she is perceiving, or remembering, fireworks, via those experiences alone. SAME is consistent with S still being able to tell that she is

[27] By 'external' I just mean something akin to a local cue or third-person testimony. S might be able to tell that she is undergoing E* (and not E) because her friend, who she trusts and is somehow privy to these things, tells her that she is undergoing E*.

undergoing two *distinct* experiences.[28] But that S can tell that E and E* are distinct does not entail that S will be able to tell that E is a perceptual experience and E* is a memory experience.

The upshot for P2*R* is that, since HK *can* tell on his own whether he is perceiving the fireworks or remembering his perceiving them, it follows by modus tollens on SAME that the relevant E_M/E_P pairs differ in phenomenal character. (It is not as if HK always has a friend tell him when he is recalling a perceptual experience or having a perceptual experience.) This does not mean that HK always 'uses' these distinct phenomenologies to tell what kind of experience he is having. The point is just that, if those phenomenologies were not distinct, he would not be able to tell whether he is perceiving or remembering the fireworks from the first-person perspective.

Here is the second point: HK does not otherwise act as if his perceptions and memories are phenomenologically identical. It is fair to expect that, if a subject S has an experience E*, phenomenally identical to a prior experience E also had by S, that, after having E*, S would be at least disposed to say things like 'I have had *that* experience before'—where 'that' picks out an experience-token (E*) that is of a certain familiar phenomenal type, viz. a type of which E is also a token. HK, while acknowledging that his memories are intense, never does anything of the kind.

In sum, the representationalist will invariably appeal to some property of HK's E_M to explain his ability to report on the details of his corresponding E_P with such accuracy and specificity. Of course, HK's episodic memories, like experiences generally, will have lots of properties. But most of these properties—occurring on a Wednesday, being had by a man under ten feet tall—are irrelevant. Presumably the relevant properties will either be the representational or the phenomenal ones. I have argued that the latter will not cut it, and that the behavior-representation connection gives us independent reasons to appeal to the former. If that's right, we have evidence for P2*R*.

3.2 The richness proposal: artistic savants

Our next thread of evidence for P2*R* comes from savant syndrome. Savant syndrome is a rare but remarkable condition in which subjects with a serious developmental disability (e.g. autism spectrum disorder) nonetheless demonstrate a domain-specific 'island' of spectacular ability that stands in a stark contrast to 'handicaps' they exhibit. Unlike *talented savants*, who have skills that are remarkable relative to their handicapped peers, our focus will be on *prodigious savants*. These savants have abilities that are spectacular not just relative to the 'handicapped', but also relative to 'normal' populations. Our focus will be on one fairly famous

[28] So the following nearby thesis is false: if a subject S undergoes two experiences E and E*, E at t_1 and E* at t_2, where E and E* have the same phenomenal character, then S will not be able to tell, unaided by something external to those experiences, whether she is undergoing E* at t_2 or E at t_2. I thank an anonymous referee for pointing this out.

artistic prodigious savant who possess exceptional visual memory: Stephen Wiltshire.

Wiltshire likes to draw (often panoramic) cityscapes. As part of his process, he will go for a helicopter ride high above the city to soak in the details. Upon making a complete pass over the city, Wiltshire sits down to draw what he saw, focusing on various architectural details. No photographs are taken or used for reference. The job is done from memory alone. The results are stunning.[29]

The argument from prodigious savant syndrome to P2*R* is structurally similar to our earlier argument from episodic HSAM:

P2*Rc* Artistic savants with prodigious visual memory (like Wiltshire) can draw, from memory alone, depictions of scenes with remarkable specificity and accuracy.

P2*Rd* That artistic savants with prodigious visual memory (like Wiltshire) can draw, from memory alone, depictions of scenes with remarkable specificity and accuracy is evidence that they have memories that are just as representationally rich as their perceptual experiences.

So, once again, we have evidence that:

P2*R* There is a psychologically possible E_M/E_P pair whose members differ in phenomenal character but are identical in their representational richness.

I'll assume P2*R*c is true. What needs defending is P2*R*d.

The case for P2*R*d is like the case for P2*R*b, but arguably better. Start again with the behavior-representation connection, and assume once more that C1 and C1 are in place. Then ask: what explains Wiltshire's ability to produce remarkably accurate drawings from memory? Again, a quite plausible answer is that Wiltshire's E_M has a content that provides him with nearly as much information about the cityscapes as does the content of his corresponding E_P —i.e. the visual experiences he has while riding above the city in a helicopter.

As with HK, the case here is imperfect. The drawings, though impressive, do not capture every original detail.[30] But again: like HK, Wiltshire is not meant to be an actual case of identical richness, but evidence of the possibility of such a case—evidence that is enhanced by C1 and C2. And as before, cases of prodigious savant syndrome like Wiltshire's should, if anything, significantly raise our credence in P2*R* rather than lower it.

It is important to note that we are not concerned with the quality of Wiltshire's drawing. Wiltshire's drawings have gotten better over time (Pring et al. 1997), suggesting that there are other factors at play, in particular issues concerning savant talent, and the mechanism used by savants to establish long-term procedural knowledge (Pring 2008). But this is beside the point; what we are interested in is how much is remembered, not how well the artist draws what it is remembered, or even what the savant chooses

[29] Alas, I was unable to acquire copyright release to use images of Wiltshire's drawings here. To get an idea of their accuracy and level of detail, my advice would be to search for images of Wiltshire's cityscapes and juxtapose them with photographs of those cityscapes. For videos of Wiltshire's process, including excerpts from the 2006 documentary "Beautiful Minds: A Voyage into the Brain" featuring Wiltshire, see http://www.stephenwiltshire.co.uk/.

[30] Though some of this might be due to artistic license, rather than lack of recall. See below.

to draw from memory. Artistic savants, like artists generally, sometimes embellish for purely stylistic reasons (Pring et al. 1997). So it might be the case that having implicitly learned the geometry of spatial relationships (perhaps using linear perspective and size constancy), Wiltshire can now better capture details that are invariant across cityscapes. What such knowledge cannot account for, however, is Wiltshire's ability to capture, with high fidelity, details that are *unique* to each cityscape. And that is plausibly due to his visual episodic memory alone; Wiltshire can replicate the fine details of a specific building in a cityscape without looking at a picture only because he can remember the fine details of that specific building.

This point underscores that the force of the behavior-representation connection is, in fact, arguably stronger here then it was in HK's case. Suppose S is in a representational state M with a content C, and as a result of being in M, S φ's, where 'φ"ing' picks out some behavior-type (running from the tiger, drawing a cityscape, etc.). Then we ask: had S been in some distinct representational state M* with a content C*, could S still have φ'ed? Unlike our earlier example of grabbing a large toy block, when it comes to Wiltshire, the answer seems to be *no*. It is not clear what other representational state, aside from a representational state which provides very rich, fine-grained information about the facade of (say) the Kremlin palace—an actual drawing of Wiltshire's—would have enabled Wiltshire to draw a (nearly exact) replica of the Kremlin palace from memory.

There might be other explanations of Wiltshire's ability. There is, as with HK, the phenomenological explanation, but for the same reasons adduced above, I reject that explanation here. In any event, the present explanation tallies well with the suggestion, often made in the empirical literature, that the artistic savant's ability is due to a failure in the "swift metabolism" of visual short-term memory (e.g. Treffert 1988: p. 568; Hou et al. 2000: p. 37). This in turn suggests that the earlier interpretation of the Sperling experiments—that we consciously perceive more than we access in memory and thought—does not generalize. Wiltshire's memory, like HK, is exceptional because it is the exception to this rule.

3.3 The fineness of grain proposal

Such is the case for P2*R*, and the first half of our defense of P2. The second half consists in providing evidence that:

P2*F* There is a psychologically possible E_M/E_P pair whose members differ in phenomenal character but are equally fine-grained (i.e. represent with the same level of determinacy).

Defending P2 requires defending P2*F* given INTELLIGIBILITY and our analysis of presentational character in terms of fineness of grain. My discussion of P2*F* will have two parts. The first covers Bourget's recent case against P2*F*. I argue that it fails. The second leverages our earlier discussion of exceptional episodic memory as evidence for P2*F*.

3.3.1 Bourget on precise colors

Bourget's stated target is what he calls 'cognitive experiences'—imagery experiences and thought experiences—experiences that, unlike 'vivid' perceptual experiences, have 'faint' phenomenology. Whatever 'faint' phenomenology might amount to, this distinction seems right. So I will assimilate vivid experiences with those that have presentational character, and faint experiences with those that do not. Bourget's main argument concerns imagery experience, so I will put my focus there, and then examine whether it extends to memory experiences, i.e. the experiences that constitute episodic recall.

In ideal conditions, visual experiences represent what Bourget (2017b: p. 675) calls *precise colors*. Precise colors are minimally discriminable colors: colors that, if just a little more similar, would be indiscriminable. We can reconstruct Bourget's (*ibid*: 675–676) argument as follows:

F1 If your imagery experience represents precise colors, you will be able to identify the precise colors of the object you are imagining, based on the content of that imagery experience.
F2 You cannot identify the precise color of the object you are imagining based on the content of that imagery experience.
∴ Your imagery experience does not represent precise colors.

The upshot is this: if imagery experiences do not represent precise colors, but visual experiences do, they will differ in their fineness of grain, and therefore, their content.

The structurally analogous argument for us looks like this:

F1*m* If the experience you undergo (E_M) when you recall seeing the Fabergé egg (E_P) represents precise colors, then you will be able to identify the precise color of the Fabergé egg based on the content of E_M.
F2*m* You cannot identify the precise color of the Fabergé egg based on the content of E_M.
∴ E_M does not represent precise colors.

While imagery experiences are not memory experiences, it is easy to see why considerations in favor of the F1–F2 argument might carry over to the F1*m*–F2*m* argument. For it is not implausible to think that episodic memory, at least of the sort examined here, standardly *involves* imagery (i.e. memory-backed imagery). So if F1 and F2 are true, P2*F* may very well be false.

3.3.2 Exceptional memory and representational determinacy

Let us look at F2 (and F2*m*) first. F2 is supposed to follow from reflection on our own abilities.[31] Bourget (*ibid*: 676) instructs us to consider a familiar red object, like the

[31] Not entirely from such reflection, as Bourget does detail some supporting empirical evidence. But the point I will make against F2 holds for the empirical evidence too.

stop sign near your home, and then lay out color samples containing the precise color of the stop sign and neighboring precise colors. We are then told to visualize the red object, and based on the content of that imagery experience, pick out the color of the imagined object amongst the samples. The idea is that we will not be able to do so. Hence, F2.

There is an immediate difficulty with this line in the present context. Consider our discussion of the richness proposal. Everything in that discussion is consistent with the *vast majority* of E_M/E_P pairs having members who differ in the richness of their content. The entire point of invoking subjects with 'exceptional' memory is that they cast doubt on the generality of the richness proposal. Likewise for our ability to identify precise colors and the fineness of grain proposal. Bourget is probably right that F2 is true—most of the time. But his case for the psychologically impossibility of fine-grained imagery experiences (and so memory experiences) rests on what *we*, i.e. every day, average subjects, can do. HK and Wiltshire are anything but.

To streamline things, let us focus on Wiltshire, which again is arguably the better case anyway. Now, if you look at his drawings, what is remarkable about them is not simply the amount of detail captured. It is not simply that Wiltshire tends to get the number of skyscrapers along the banks of the River Thames correct, as found in another of his drawings. He also accurately captures (or gets quite close to capturing) *the precise shapes* of the skyscrapers. That is evidence that the content of his memory experiences are far more fine-grained than normal. Again, modesty is required here, since the drawing are not perfect replicas. But, once more assuming C1 and C2, Wiltshire should raise our credence in P2*F*. Certainly Bourget has not given us any reason to think otherwise. What normal subjects can identity in imagery and memory is, by design, beside the point.[32]

What about F1 (and F2*m*)? Bourget (*ibid*: 679) recognizes the possibility that what might seem like a limitation on the content of imagery experiences is actually a limit on our ability to cognitively access those experiences. This harkens back to our earlier discussion of the Sperling Paradigm and overflow; it might be that, while imagery *does* have fine-grained content, we cannot re-identify precise colors due to our inability to access that part of the content. If that is right, F1 is false.

Bourget (*ibid*) responds by noting that imagery cases are crucially different; unlike standard Sperling cases, "it does not introspectively seem that we experience precise colors in imagery." I think Bourget is right, but this does not help save the fineness of grain proposal. For this is *exactly* what we would expect if representationalism were false. If E_M does not have presentational character, it will not "introspectively seem" to a subject that they are presented with precise colors in memory. Prima facie, the way things seem introspectively tracks phenomenology. But the point of our preceding discussion is that the relevant E_M/E_P pairs differ in phenomenal character despite

[32] In fairness, Bourget (*ibid*: 685) does briefly attempt to make a distinct argument concerning the metaphysical impossibility of equally fine-grained E_M/E_P pairs. But the method he settles on for determining this—what he calls the "empirical method" (*ibid*)—is no help here, since my contention is that "the victor in the actual world" is *not* the intermodal view.

lacking any representational difference that would render that phenomenal difference intelligible. To assume that we can move immediately from the way things seem introspectively to a claim about what our experiences do and do not represent risks trivializing the debate over representationalism.[33]

4 Limits of memory and the borders of the mind

I have argued that we have good reason to reject representationalism if we assume INTELLIGIBILITY. In particular, I have argued that subjects with exceptional episodic memory—HSAM and prodigious savant syndrome—provide strong evidence that representationalism is false.

This leaves open several options. One is intramodal representationalism (fn. 1). Others, like qualia realism and naïve realism, dispense with the representational-theoretic approach altogether. All of these views have their own problems, and I do not intend to settle the way forward here. Instead, I will close by briefly emphasize something else that we have learned, independent of the truth or falsity of representationalism.

When thinking about the nature of the mind, we often think in terms of borders: the sensation versus perception border; the cognition versus perception border; and the perception versus memory border. Not every countenances these borders, but if you do, you need to give an account of that border—an account of what it is that makes, say, perception different from thought. If I am right, an upshot of this paper is that memory and perception, though different, are not *as different* as many had thought. For if HSAM and prodigious savant syndrome show what I take them to show, then there are psychologically possible E_M/E_P pairs whose members are equally rich and equally fine-grained. That is surprising, and it should be surprising irrespective of what one thinks of representationalism.[34]

[33] I think this problem is somewhat common in discussions of representationalism. For example, Lycan (2015) points out that Byrne (2001) plausibly errs in a similar way in his 'argument from seeming.' Very roughly, the argument goes like this: Suppose that an idealized subject S has two phenomenologically distinct experiences, E and E*. Being idealized, (i) the way things seem to our subject in virtue of undergoing E and E* will be different. But (ii) if things seem different to S, then E and E* will represent the world as being different. The problem, as Lycan notes, is that it is not unreasonable for the anti-representationalist to say that Byrne equivocates on 'seems': in (i) it is used in the phenomenal sense; in (ii) it is used in the representational sense. See also Pautz's (2009) discussion of the 'appears-looks' conception of experiential content, which (Pautz contends) makes the claim that experiences have content trivial.

[34] I first wrote an ancestor version of this paper in December 2010. For helpful comments on that paper I thank Myrto Mylopoulos, Colin Klein, James Virtel, and audiences at Kent State, CUNY Graduate Center, the ASSC 15 in Kyoto, and the Central APA. That paper was lost for almost six years, only to be entirely re-written and re-invigorated in the Fall of 2016. For comments on the more recent version, I thank Ed Averill, Jonathan Dorsey, Christopher Hom, Jeremy Schwartz, Jeff Speaks, Henry Taylor, Joel Velasco, and an audience at the ECAP 9 in Munich. Special thanks go to two anonymous referees for *Synthese* whose efforts greatly helped improve this paper, and my father-in-law Edward Gillette, for first pointing me to HSAM, and thus inspiring the project.

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