

What is it like to remember something?

SDAM, aphantasia, and the role of imagery in memory

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abstract — Episodic memory (EM) involves re-living or re-experiencing past experiences, which suggests that EM depends on mental imagery. Aphantasics lack mental imagery, however, which would imply that they don't have EM, and people with “severely deficient autobiographical memory” (SDAM) also lack the ability to re-live or re-experience. Both aphantasics and people with SDAM are otherwise normally functioning people, however, and do have personal memories, which is an other defining aspect of EM. By implication, episodic memory is not a natural kind but a loose collection of independent mental faculties. Aphantasics indeed lack episodic memory, because there is no such thing as episodic memory.

1

Theories of memory are mostly silent about the nature of what Endel Tulving (1983) calls the “recollective experience” – that is, the experience of remembering something, or *what it is like* to remember something. He suggested that “when a person remembers a past event, he has a memory image of it and he is consciously aware of its being a mental replay of what happened once before” (185), and that “‘memory image’ could serve as an acceptable synonym for ‘recollective experience’” (186). In other words, episodic memory (memory of experienced events rather than facts) involves mental imagery. There are people, however, who claim not to experience mental imagery. Tulving writes that such “non-imagers” (not his term) “are likely . . . to have something corresponding to recollective experience when they ‘think about’ past events” (186), but if that “something” is not mental imagery then what is it? What is it like to remember something for a non-imager? Or don't non-imagers remember anything at all?

The latter question may seem absurd, but if “remembering” (as a technical term) involves something like re-living, re-experiencing, or re-play as usually assumed (see also section 7), then people with severely deficient autobiographical memory (SDAM; Palombo *et al.* 2015) are incapable of remembering anything, while nevertheless leading normal lives. Furthermore, all three documented cases of SDAM are also non-imagers, and conversely, many non-imagers, or *aphantasics* as they are now more commonly called, report having deficient autobiographical memories (Zeman, Dewar, & Della Sala 2015; Zeman 2017).

¹ Paper presented at the workshop “Philosophy of Mental Time 6 – The Experience of Time”. Tokyo, Japan. November 25th, 2017.

(This version: 01/26/2018. Changes: typos and other minor corrections.)

If SDAM and aphantasia (*i.e.* lacking mental imagery) are genuine, then the question “What is it like to remember something?” doesn’t have a single answer that holds true for everyone, and that has important implications. Firstly, the phenomenology of memory (*i.e.* what it is like to remember something) and especially the variation therein need to be subjected to much more rigorous research. Secondly, implicit assumptions about the phenomenology of memory in previous conceptualizations of, and research on memory need to be made explicit. And thirdly, theories, concepts, and classifications of (kinds of) memory need to take this phenomenological variation and its implications into account.

The present paper aims to contribute to the third of these tasks by reassessing the semantic/episodic memory distinction in the light of what we currently know about SDAM and aphantasia (and related matters). Section 2 looks into the evidence for and nature of SDAM and aphantasia, and section 3 discusses the main skeptical argument (that is, Schwitzgebel’s) against the existence of aphantasia. After that, sections 4 and 5 assess the implications of aphantasia for the notion of episodic memory and suggest an alternative, “modular” conceptualization of the semantic/episodic distinction. Section 6 briefly turns to the issues of evolution and non-human animals, and finally, section 7 summarizes this paper’s main findings. A summary of that summary could be that there is no such thing as episodic memory.

2

Usually Francis Galton (1880) is credited with being the first to recognize the existence of people who claim not to experience imagery. Research on the phenomenon has been scarce, however, and of dubious quality, until very recently. In 2010, Adam Zeman and colleagues published a paper reporting on a 65-year old man who had lost the ability to experience imagery, but who otherwise functioned normally. 21 people contacted Zeman after that, writing that they didn’t experience imagery either, but that their “condition” had been lifelong. These 21 individuals were sent a questionnaire, which all of them filled in. The results were published in Zeman, Dewar, & Della Sala (2015), which coined the term “congenital aphantasia”. (Until the publication of that paper “non-imager” was the standard term for someone lacking mental imagery, but it has since been replaced by “aphantasic”.) Of the participants in this initial, small study, about half reported that they did not have imagery in any modality; half experienced involuntary flashes of imagery; the majority experienced imagery in dreams; the majority had difficulties with autobiographical memory; and about a quarter reported having family members with aphantasia.

The 2015 publication received a lot of public attention (although only in English-speaking countries) – it was mentioned in the popular press, popular science magazines, and on TV – leading to over 10,000 emails to the research group from people who have aphantasia, or the opposite, hyperphantasia (extremely vivid imagery). More than 2000 of those have filled in complete questionnaires. The results thereof have been analyzed mostly, but have not been published yet, except for a few remarks in a post on the research group’s website (Zeman 2017). In that short report, Adam Zeman writes that the results confirm the relation with autobiographical memory, as well as the expected relation with prosopagnosia (a deficiency with regards to facial recognition), and suggests that “imagery vividness can run in families”.

Around the time of the (2015) paper by Zeman and colleagues, two other related papers were published. Daniel Greenberg and Barbara Knowlton (2014) investigated the role of visual imagery in autobiographical memory, and one of the experiments in that study involved two non-imagers (or aphantasics). Both participants had “highly abnormal ratings for reliving”,

which according to the authors confirms “previous work showing that mental imagery is necessary (though not sufficient) for a strong sense of reliving” (931), and which explains the aforementioned self-reported memory deficiencies of aphantasics.

Daniela Palombo and colleagues (2015) also reported on a study about “re-living” or “the subjective sense of re-experiencing” in episodic memory, and coined the term “severely deficient autobiographic memory” (SDAM) to describe three cases of healthy adults reporting not to “re-live” or “subjectively re-experience” previously experienced events. All three cases scored normally on most standard neuropsychological tests except for complex figure recall: their test scores were “notable for impaired recovery of visual information” (111). fMRI showed reduced activation of brain regions involved in autobiographic memory, and structural neuroimaging revealed a slight reduction in the volume of the right hippocampus, which is associated with the recollection of non-verbal/visual information.

Evidence for aphantasia and SDAM is still scarce and may be insufficient to silence the skeptics, but I will address the main skeptical argument against the existence of aphantasia in section 3 below. The remainder of this section further explores the nature of and relation between aphantasia and SDAM.

Aphantasia is defined in Zeman, Dewar, & Della Sala (2015) as “a condition of reduced or absent voluntary imagery”. This rough definition is ambiguous in three different ways. Most obviously, the term “reduced” immediately raises the question: Reduced to what extent (or by how much)? Furthermore, the phrase “reduced or absent” also suggests continuity between weak (or “low”) imagers and non-imagers and it is presently unknown whether there is such a continuity. Although it is intuitively plausible that absence of imagery is the low extreme on a scale ranging from no imagery to extremely vivid imagery (as reported by hyperphantasics), it might turn out to be the case that non-imagers are not just very weak imagers but that there is a qualitative difference between having (very) weak imagery abilities and having no such abilities whatsoever.

Secondly, voluntary imagery contrasts with involuntary imagery, which comes in two very different kinds: involuntary flashes of imagery during wakefulness, and imagery in (lucid) dreams. Given the role of imagery in autobiographic memory (*e.g.* Greenberg & Knowlton 2014), one would expect significant differences in memory between someone who experiences no involuntary imagery at all or only in dreams, and someone who experiences flashes of imagery related to previous experiences during wakefulness.

Thirdly, as mentioned above, only about half of the respondents in the initial study reported lacking imagery in all sense modalities. This, of course, raises the question: How many and which kinds of imagery must be affected for the “aphantasia” label to apply? What complicates this is the number of different kinds of imagery, opacity in introspection, and the possibility of overlap. A list of kinds of imagery does not coincide with a list of sense modalities. There is no single faculty of visual imagery, for example. Instead, there are (at least) two distinct kinds of visual imagery – object imagery and spatial imagery – and these two play different roles (Kosslyn 1994). And some kinds of imagery – such as motor imagery – do not seem to be associated with particular sense modalities at all. (The other way around, while there is a sense of balance, I doubt there is imagery of balance.) It may be the case that in imagining shapes, a lack of object imagery can be compensated (at least partially) with spatial imagery and/or motor imagery. If there are such compensation effects and other interactions and overlaps between different kinds of imagery, it may be hard to keep them apart in introspection, but also in psychological tests (if those are insufficiently carefully designed). Furthermore, some kinds of imagery (such as spatial and motor imagery) may present themselves in a form that is less likely to be recognized as imagery, which further diminishes the reliability of introspection. (On introspection, see also next section.)

These considerations suggest that the least ambiguous variety of aphantasia is a condition of completely lacking voluntary imagery of any kind and lacking involuntary (flashes of) imagery during wakefulness. Nicholas Watkins (*in press*), one of the three cases in the SDAM study, calls this “total aphantasia”. However, the above considerations also suggest that introspection is probably not a reliable method to distinguishing such total aphantasia – if it exists – from near-total aphantasia, and perhaps even from variants of far-from-total aphantasia. It may turn out to be the case that self-reported total aphantasia is never really “total”. This, as well as the relation between aphantasia and SDAM, is a question for future research.

Regarding that relation, Watkins draws a diagram of three nested circles – the largest represents aphantasia as defined in Zeman, Dewar, & Della Sala (2015); within that circle there is a smaller circle representing total aphantasia; and within that circle there is an even smaller circle representing SDAM. SDAM is Palombo *et al.*'s (2015) label for “a mnemonic syndrome that is confined to an inability to mentally travel backwards in time in the absence of detectable neuropathology or significant daily handicap” (111), or more informally, “the inability to re-experience personal events” (106). As mentioned above, the three documented cases of SDAM lack the ability to experience imagery of past experiences, and it seems plausible that their aphantasia is the cause of their SDAM. If re-living experiences requires imagery, then a total aphantasic is incapable of re-experiencing mental events, and then all cases of *total* aphantasia would be cases of SDAM. (But someone with involuntary imagery, imagery in at least some relevant modalities, or very weak imagery would not necessarily have SDAM.) However, it is conceivable that someone has functioning imagery abilities, but cannot use that ability to re-live her own past. This would be a (hypothetical?) case of SDAM without aphantasia.

3

While there has been heated debate about the status, role, and nature of mental imagery since the 1970s, both sides in that debate share a conception of mental imagery, as well as the belief that the experience and phenomenology of imagery are universal (*e.g.* Thomson 2007). For example, Daniel Dennett wrote that “nobody denies that when we engage in mental imagery we seem to be making pictures in our head” (2002: 189). Given the almost universal acceptance of the idea that we all share the same kind of mental imagery, it should not come as a surprise that the rejection of that very idea by people who claim not to experience imagery at all has been met with considerable skepticism and even hostility. As Bill Faw observed:

Much of the current imaging literature either denies the existence of wakeful non-mental imagers, views non-imagers motivationally as “repressors” or “neurotic”, or acknowledges them but does not fully incorporate them into their models. (2009: 45)

One of the most outspoken recent skeptics is Eric Schwitzgebel. The experience of imagery is a recurring theme in a series of articles on the unreliability of introspection (2002; 2008; 2011; 2012a; 2012b). Schwitzgebel's argument is by far the most sophisticated argument against aphantasia and eclipses earlier skeptical arguments. His argument can be summarized as follows:

- 1) Mental imagery is evasive and indeterminate. “My experiences flee and scatter as I reflect” (2008: 267), and it is unclear, for example, how much you can visualize at once. Because of this, questions about the details of imagery are hard to answer (contrary to questions about the details of perception), and consequently, introspection of imagery is unreliable.
- 2) “If differences in imagery ability are as vast” as suggested by the self-reports of aphantasics and hyperphantasics, then “we should presumably expect vast corresponding differences on cognitive tasks involving imagery” (2011: 44).
- 3) However, there is no evidence for such differences: “self-described high- and low-imagery people do not appear to perform any differently, in general, on psychological tests that have widely been thought to be aided by visual imagery” (2012a: 187).
- 4) Therefore, non-imagery people are mistaken about their imagery experience, “differences in imagery reports do not reliably reflect differences in imagery experience” (2002: 45), and there are no substantial differences in imagery capability across individuals: “people are largely the same *except* when they introspect” (2008: 264).
- 5) “We are prone to gross error, even in favorable circumstances of extended reflection, about our ongoing emotional, visual, and cognitive phenomenology” (2008: 259).

Schwitzgebel’s argument is intended primarily to refute the common belief in the reliability of introspection – that is, (5) – and (1) to (4) is not his only argument that leads to that conclusion. However, the part of his argument that is of interest here is the intermediate conclusion (4) that rejects aphantasia (but note that Schwitzgebel’s writings on this topic predate the coining of that term). For that reason, I’ll further ignore (5).

(ad 1) – In case of visual perception “we have the illusion that we are taking in all of the details simultaneously, when in fact the experience is built up sequentially” (Engelbert & Carruthers 2010: 251). If we cannot focus on the whole picture at once in visual imagery, then visual imagery would be very similar to visual experience, *except* that visual imagery would be lacking this *illusion* of simultaneity. This is hardly an argument for the unreliability of introspection of mental imagery (relative to the reliability of visual experience, at least).

Moreover, while the evasiveness and indeterminacy of mental imagery certainly seem to imply that we can be – and perhaps often are – wrong about the details of imagery, it does not imply that we are “prone to gross error”. That we can be wrong about *anything* does not imply that we can be wrong about *everything*. If we would be prone to gross error in introspective judgment of our own emotions, for example, and thus would consistently misjudge how we feel, then our self-ascribed emotional states and our actual emotional states as revealed by our behavior would be completely unrelated. Aside from the fact that this obviously isn’t the case, it is doubtful that this would even be possible. If there would be no relation between the observed behavior of others and their self-ascribed emotional states, it would be very difficult – if not impossible – to learn words to describe emotional states. (A vocabulary to describe third person behavior may still be possible, but that is not sufficient.) And lacking a vocabulary for emotional states, we would be unable to self-ascribe emotional states in the first place. If this is right, when it comes to introspecting emotional states, the idea of gross or massive error is incoherent. And most likely the same is true for other kinds of introspection. (The argument in this paragraph is Davidsonian in spirit. See, for example, Davidson 1999.)

Schwitzgebel makes a valid point when he asserts that introspection cannot tell us much about the details of what goes on in our minds. Although it is widely assumed that our minds are transparent to ourselves, as Peter Carruthers (2011) has most forcefully shown, our minds

are really terribly opaque. Most of the time we have no clue about what and how *exactly* we are thinking, feeling, and so forth. Moreover, there are independent reasons to doubt the reliability of introspection of some aspects of imagery. (See previous section.) However, that we can be wrong about any detail of the introspective pictures we sketch of our own mental lives does not imply that we are completely wrong about all of the broad outlines. And that we can be wrong about any particular detail of (the phenomenology of) our imagery does not imply that we are wrong about not having imagery at all, or about having extremely vivid imagery.

Furthermore, Schwitzgebel's argument that introspection of imagery is unreliable is based on introspection of his own imagery, which appears to be extremely vivid (see, for example, 2012b: 37). This appears to be self-defeating, but it also nicely illustrates that researchers' theoretical views about imagery are influenced by the vividness of their own imagery (Reisberg, Pearson, & Kosslyn 2002; Faw 2009). More importantly, *if* Schwitzgebel's introspective experience entitles him to believe that he experiences imagery, then a non-imager's introspective experience entitles her to believe that she doesn't. (See also Hohwy 2011.)

(ad 2) – If there are significant differences in imagery abilities across individuals, one would expect these differences to matter, but why would they imply “vast corresponding differences on cognitive tasks involving imagery” (emphasis added)? Many deficiencies can be compensated. A lack of imagery of some kind could be compensated by imagery of other kinds, or even by other mental faculties. (See also previous section.) If tests are not carefully designed to take that into account it is doubtful that they would find significant differences between non- or low-imagers and high-imagers.

For example, one of the most common kinds of tests that is supposed to involve imagery are mental rotation tests. Subjects get to see one figure and have to compare that figure to one or more other figures to judge whether one or more of those other figures are rotated versions of the original figure. However, if the first figure and test figures are shown simultaneously, the subject can just glance back and forth between pictures to compare detail by detail without ever forming a mental image, and even if the first figure must be remembered to do the test, the subject can remember a verbal description of the figure – provided that the figure is simple enough, which usually is the case – and then compare the test figures with that description. These suggestions do, of course, imply that non- or low-imagers and high-imagers use different brain regions in mental rotation tasks, and there is evidence for such a difference indeed (Logie *et al.* 2011).

If some people lack a certain mental ability, and there are ways of compensating that deficiency in many (perhaps even most) circumstances, then one would expect that deficiency only to have rather subtle effects. Considering that a lack of (specific kinds of) imagery can probably be compensated in various ways in many circumstances, if there are significant differences in imagery abilities across individuals, one would expect there to be *subtle* – but not *vast* – corresponding differences on cognitive tasks involving imagery, and some of those differences might only show up on an fMRI scan or with the help of another imaging technique.

(ad 3) – As mentioned two paragraphs back, Logie *et al.* (2011) found that low- and high-imagers show different brain activation patterns in mental rotation tasks. The study that defined SDAM by Palombo *et al.* (2015) found that their aphantasic cases were in the severely impaired range for complex figure recall. Zeman (2017) found a link between aphantasia and prosopagnosia (reduced facial recognition). And directly contradicting Schwitzgebel's claims,

Rebecca Keogh and Joel Pearson (*in press*) found that “congenital aphantasia is characterised by a lack of low-level sensory visual imagery, and is not due to a lack of metacognition or an inability to introspect”.

There isn't *much* evidence for (the effects of) aphantasia (yet?), but Schwitzgebel's claim that there is no evidence is false. (But it must be noted that all of this evidence was published *after* Schwitzgebel published his main papers on introspection.) It is true, however, that most earlier studies do *not* reveal any substantial differences between low- and high-imagers on cognitive tasks involving imagery. This *apparent* negative evidence may be due to three methodological flaws, the first two of which were already pointed at above.

Most tests ignore the possibility of compensating for deficiencies. Mental rotation tests, for example, nearly always allow for various answering strategies that do not require mental imagery. Secondly, and related to the neglected possibility of compensation, differences between low- and high-imagers are more likely to be subtle than vast and may only be revealed by means of neuroimaging. Thirdly, virtually all the research on the effects of vividness of imagery until now compares low-imagers to high-imagers, but it may be the case that low-imagers are more similar to high-imagers than to non-imagers.

To illustrate the latter, imagine a test that requires the subject to read a word every once in a while. People who are very good at reading and people who can just barely read are not likely to score very differently on this test (assuming that reading skill is not correlated to whatever is tested), but people who cannot read *at all* will deviate significantly. Similarly, if a test requires only very basic imagery, low-imagers and high-imagers are not likely to score significantly differently, but non-imagers will (except if they can compensate for the lack of imagery).

For now, the evidence for aphantasia and SDAM and their effects is scarce. More research is needed, but future research also needs to take the above three methodological points into account.

(ad 4) – Schwitzgebel's skeptical conclusion about aphantasia follows from premises (1) to (3), but we have found that all three of these premises are false. Consequently, his argument against aphantasia fails.

If there is no successful argument against aphantasia we should take the phenomenon seriously and consider its implications for our conceptualizations of and research on memory. This is the topic of the following two sections of this paper.

4

One of the most influential distinctions of kinds of memory is that between semantic and episodic memory by Endel Tulving (1972; 1983). Semantic memory is memory of facts; episodic memory is – more or less – memory of experienced episodes. In (1972), Tulving defined episodic memory as memory of *what/where/when*, adding the phenomenology of the “recollective experience” in (1983). The original *what/where/when* conceptualization remains influential, however, and in laboratory tests episodic memory is often operationalized as memory of visual stimuli. Consequently, the concept of “episodic memory” has become somewhat muddled.

In *Elements of Episodic Memory* (1983), Tulving listed 28 “diagnostic features” of episodic and semantic memory (see table 3.1 on page 35). These features are a rather varied bunch including items like usefulness, likelihood of realization in artificial intelligence, and admissibility as legal testimony, in addition to a number of apparently more likely candidates

for defining features of the semantic/episodic distinction. (It must be noted that Tulving admitted himself that “some features may turn out to be irrelevant to the distinction” (35).) Table 1 below lists the eight most relevant “diagnostic features”. (Omitted features are either very similar, or consequences more than essential characteristics.)

table 1: selected “diagnostic features” of episodic and semantic memory

	<i>diagnostic feature</i>	<i>episodic memory</i>	<i>semantic memory</i>
1	source	sensation	comprehension
2	units	events, episodes	facts, ideas, concepts
3	organization	temporal	conceptual
4	reference	self	universe
5	registration	experiential	symbolic
6	affect	more important	less important
7	retrieval queries	time? place?	what?
8	recollective experience	remembered past	actualized knowledge

(source: Tulving 1983: 35)

Tulving (1983) thinks of the retrieval of episodic memory as a kind of replay or re-experiencing. Except from (4) and (6), all of the features in the “episodic memory” column in table 1 are related to this conception of episodic memory. The source of episodic memory is sense experience and its recollection is, more or less, a revisiting of that sense experience. This implies that episodic memory depends on the sense modalities. It is often multi-modal, and by definition never amodal. In contrast, the corresponding features in the last column sketch semantic memory as being conceptual and not directly dependent on sense experience. Semantic memory is *amodal*.

The remaining two features, (4) and (6), seem to refer to two different, albeit possibly related, aspects of episodic memory: self-referentiality (4) and the emotional attachment to some kinds of memories (6). Mark Johnston (2010) suggested that the self is something like “an arena with some person at the phenomenological center” (237). Episodic memory is the memory of what happened in that arena and to the subject/self at its center. Features (5) and (8) also refer to the focus of episodic memory on that arena and its center. These features and their counterparts for semantic memory imply that episodic memory is self-centered and, therefore, *personal*, while semantic memory – lacking any similar kind of focus – is uncentered and *impersonal*.

The role of feature (6), affect, in episodic memory is often alluded to as the “warmth and intimacy” that suffuses remembering (James 1890: 239). Supposedly, we feel an emotional attachment to our episodic memories, while semantic memories are more emotionally neutral.

The eight listed features can thus be grouped into three different contrasting pairs: (i) modal/amodal, (ii) personal/impersonal, and (iii) affective/neutral. Of these three, the modal/amodal contrast appears to be most fundamental. It may also be the most problematic.

In *Mental Time Travel* (2016), Kourken Michaelian shows that episodic memory is mental time travel into the past, and that mental time travel in general is a kind of imagination. Hence, episodic memory is imagination of the experienced past. But episodic memory is *modal* memory and, therefore, a kind of *modal* imagination, and modal imagination is mental imagery. By implication, people who lack mental imagery – that is, aphantasics – lack modal memory, and thus, episodic memory, but that conclusion seems absurd.

According to Lawrence Barsalou (e.g. 2009) and other advocates of “situated cognition” there is no independent amodal memory, however. Even the memory of words and concepts involves imagery-like simulations of relevant situations in memory. If this is true, then aphantasics really do have mental imagery, but somehow just aren’t aware of it. Rebecca Keogh and Joel Pearson’s (in press) findings (see above), as well as the differences in brain activation patterns between low- and high-imagers (Logie *et al.* 2011), and the documented neural correlates of semantic and episodic memory, which are often operationalized more or less as amodal and modal memory (e.g. Wiggs, Weisberg, & Martin 1998) all seem to contradict this suggestion, however. Furthermore, even if it is true that the vast majority of people always activate modal memory or imagery-like simulations, this doesn’t imply that *all* people necessarily do so. Neither Barsalou, nor anyone else has investigated whether aphantasics also activate some kind of (unconscious) mental imagery when processing apparently amodal information. Given the – admittedly still scarce – available evidence, it seems more likely that aphantasics (as well as people with SDAM) lack modal memory indeed.

But if aphantasics lack modal memory, how do they remember shapes, sounds, and other modal or sensory “information”? This question stands in need of an answer because low-imagers do not score significantly worse on mental rotation tasks (there is no separate data for aphantasics, unfortunately), and aphantasics do not appear to suffer from any cognitive impairments. The answer to this question was already (partially) given above, however: aphantasics rely on the conceptualization of modal/sensory information. In a mental rotation test, an aphantasic can compensate for her lack of mental imagery by memorizing a verbal description of the test figure. Behaviorally – that is, from a second-person point of view – the aphantasic subject will appear to have functional modal memory when doing a mental rotation test, while she is really relying on amodal memory. If this is right, then there is a kind of memory that has some apparent characteristics of both amodal and modal memory. I’ll call this *pseudo-modal memory* in the following.

Pseudo-modal memory is verbalized/conceptualized and “de-modalized” or abstracted sensory experience. It is memory of a visual experience of a purple triangle in the form of a description (i.e. “purple triangle”), rather than in the form of imagery. From an outside or second-person point of view, it is often indistinguishable whether someone relies on modal or pseudo-modal memory (thus explaining the normal scores of non- and low-imagers on many tests), but the phenomenology is very different. In other words, pseudo-modal memory is behaviorally (or from the second-person point of view) modal, but phenomenologically (and thus from the first-person point of view), and possibly also neurophysiologically, amodal.

5

If aphantasics lack modal memory but have personal memory and affective memory (the other two aspects of episodic memory distinguished above), then these three are not just different aspects of the same kind of memory, but are two or three independent dimensions or kinds of memory instead. The three distinctions on the amodal/modal dimension combined with the personal/impersonal memory contrast results – at least hypothetically – in six different kinds of memory, as shown in table 2.

table 2: amodal/modal and impersonal/personal memory

	<i>amodal</i>	<i>pseudo-modal</i>	<i>modal</i>
<i>impersonal</i>	(a)	(b)	(c)
<i>personal</i>	(d)	(e)	(f)

In addition to the SDAM and aphantasia-related evidence, which supports the (horizontal) column distinctions, there is other evidence for some of the (vertical) row distinctions in the table. Louis Renoult *et al.* (2012) argue for something they call “personal semantics”, which is “highly personal (like episodic memory), yet, at the same time, devoid of any subjective sense of recollection” (550). Personal semantics lacks the modality of episodic memory – it is personal and amodal, and therefore, cell (d) and/or (e) in the table. While Renoult *et al.* points at the difference between impersonal and personal *amodal* memory, Hung-Yu Chen and colleagues (2017) have recently shown that impersonal and personal *modal* memory – that is, (c) and (f) – activate different brain networks.

Personal semantics as conceptualized by Renoult *et al.* includes self-knowledge, which “has most often been operationalized as the summary of one’s personality traits” and “because they focus on self image, these aspects of [personal semantics] may be strongly influenced by emotional and social factors during encoding and retrieval” (555). While this suggests a link between personal and affective memory, Mark Wheeler (2000) summarized empirical evidence that dissociates personal from affective memory. There are patients with prefrontal cortical damage (including the subjects of the psychosurgical procedure of frontal leucotomy that was popular in the first half of the 20th century) that have more or less normally functioning personal memory, but that lack an interest in those personal memories. What these patients lack is a sense of their own self-continuity and an interest in themselves as persons. And consequently, “although the patients knew all of the personal facts . . . that they did before, the facts were experienced with a lack of ‘warmth and intimacy’ that William James had attributed to the way humans typically think about their lives” (Wheeler 2000: 602). It seems then, that there can be personal memory without affective memory. The converse – that is, impersonal affective memory – appears less likely (and I’m not aware of any evidence for its existence), so this would mean that we need three rows in the table rather than two (or four).

table 3: ... and neutral/affective memory

		<i>amodal</i>	<i>pseudo-modal</i>	<i>modal</i>
<i>neutral</i>	<i>impersonal</i>	(a)	(b)	(c)
	<i>personal</i>	(d)	(e)	(f)
<i>affective</i>		(g)	(h)	(i)

What still needs to be established, however, is whether affective memory can be amodal or pseudo-modal as well as modal, similar to personal and impersonal memory. Commonly it is assumed that autobiographical memory – the variant or sub-kind of episodic memory that is most explicitly personal and affective – is modal and thus fits in cell (i) in table 3, but that would have the implausible implication that aphantasics and people with SDAM lack affective memory. There is, moreover, no reason why affective memory needs to be modal.

According to Daniel Dennett (1992) and others, the self is a narrative construction. We are (more or less) the stories we tell about ourselves (to ourselves). (The idea of the narrative self has been further developed in Narrative Identity Theory within personality psychology.) In

the reported cases of frontal leucotomies, personal stories lose their role in narrative self-construction (which is an ongoing activity) – they become *just* stories, without any special relevance or affect – and the subjects lose their sense of self-continuity. Which is cause and which is effect isn't clear (to me at least), but the role these stories play *explains* their affect, and that explanation does not in any way depend on their form. That is, these stories – the elements of our self-identity – can be modal (in the form of imagery-involving recollections or re-imaginings), but they can also be amodal (that is, more explicitly *story-like*). In either case, they form who (we think) we are. In other words, there is no reason why an aphantasic or someone with SDAM could not have affective memory, but this should have been obvious anyway: someone *without* affective memory would be like a frontal leucotomy patient, and aphantasics (*etc.*) most certainly are not.²

While the claim that aphantasics and people with SDAM lack personal or affective memory would be implausible, they *do* have autobiographical memory deficiencies. Many aphantasics report having bad personal memories, and the abbreviation “SDAM” stands for “severely deficient autobiographical memory”. However, these deficiencies are – most likely – not explained by deficiencies with regard to personal or affective memory, but by the lack of modal memory.

Anna Basso and colleagues (Basso, Bissiach, & Luzzatti 1980) report on a case of loss of imagery. The patient “said he *knew* his wife to be ‘small, grey haired, with almond-shaped eyes’ but was unable to conjure up a picture of her in his mind” (436). This and other aspects of the case report show that the patient – after losing imagery – had to switch from inferring amodal descriptions (or “semantic” knowledge) from modal memory (*i.e.* imagery) to directly recalling stored amodal descriptions – that is, (b) in table 3. But lacking such stored amodal descriptions, he experienced severe memory deficiencies. Presumably, aphantasics and people with SDAM store much more information in amodal form – or in other words, they make extensive use of pseudo-modal memory – to compensate for the lack of modal memory, but this comes with a number of disadvantages. Firstly, there is probably a limit to how much information can be conceptualized (or “semanticized”, or “amodalized”) and stored in amodal form. Secondly, this process might not be entirely automatic, and thus, if the subject doesn't remember to remember (*i.e.* store) something, it won't be remembered (*i.e.* retrieved). And thirdly, amodal memory might degrade faster and differently than modal memory. In any case, pseudo-modal memory is probably a poor substitute for modal memory in many cases, which explains the memory deficiencies of aphantasics and those with SDAM.

Instead of the simple semantic/episodic dichotomy, we now have nine different kinds of memory (in table 3). It should be obvious, however, that these are not different *kinds* in any strict sense of that term. Rather, they are different combinations of different mental faculties. A complete answer to the question what faculties – or modules, perhaps – exactly are involved is beyond the scope of this paper. I expect that there are at least four “modules” involved – modal, amodal, personal, and affective memory – but I doubt that either personal memory or affective memory is the product of a singular, dedicated “module” – more likely they are aspects of more general mental faculties. Similarly, modal memory is probably just a particular use or function of a more general faculty of modal imagination (*e.g.* Michaelian 2016), and even that is probably not a single faculty. The fact that non-total aphantasics report to have mental imagery in some modalities but not in others suggests that modal

2 It should be noted that the foregoing appears to describe pseudo-modal (h) rather than amodal (g) memory. For a possible example of (g), see Renoult and colleagues' (2012) notion of “autobiographically significant concepts”, which they assume to be part of personal semantics.

imagination – and therefore, modal memory – is not a single kind, but a collection of faculties (taking into account that the list of kinds of mental imagery differs from the list of sense modalities, as mentioned in section 2 above).³

The distinction of nine “kinds” of memory raises the question how the two-fold semantic/episodic distinction maps to this nine-fold distinction. Although Tulving’s list of diagnostic features was not intended as a conjunctive definition, it could be interpreted as such. Episodic memory, then, is the kind of memory that has *all* those features. In other words, episodic memory is (i) in table 3. In practice, episodic memory often appears to be operationalized disjunctively – that is, memory that is modal or personal or affective tends to be treated as episodic memory. In a disjunctive understanding, everything except (a) would be episodic memory. I doubt that that is a useful way to understand the notion, however, but I have similar doubts about the conjunctive understanding (as i). If the foregoing is right, then episodic memory is not a natural kind, but a label for an ill-defined collection of combinations and interactions of different mental faculties or modules. And then it would be more useful to investigate those faculties or modules (and their interactions) themselves. The notion of episodic memory, then, confuses and obfuscates more than that it clarifies or improves our understanding of human (and non-human) memory.

6

If episodic memory is not a natural kind, then ideas about the evolution of episodic memory and about continuities and differences between humans and non-human animals may require some rethinking as well. Kourken Michaelian (2016) discusses a number of proposals explaining the evolution of episodic memory and episodic mental time travel into the future – two applications of the same faculty of episodic imagination – which he appears to conceptualize as (i). However, most (perhaps, even all) of the explanations that he discards are *not* advantages of *just* (i). The abilities to avoid past mistakes and/or to plan and prepare for an uncertain future, for example, have clear evolutionary advantages, but neither depends on (i). (d) or (e) are sufficient, although lacking the affective dimension the subject may be disinterested in avoiding mistakes or in planning for the future. In any case, *modal* imagination – which is a core aspect of episodic memory – is not necessary, but this is also evident from the fact that aphantasics are just as (in-) capable of avoiding past mistakes and planning for the future as anyone else.

The explanation Michaelian favors himself is meta-cognitive: episodic memory enables “the agent to reduce uncertainty about whether he is remembering or imagining” (235), but that advantage only requires personal remember as well. Like the other explanations, it needs neither modal memory, nor affective memory, and thus (d) or (e) is sufficient. Nevertheless, the modal aspect (*i.e.* mental imagery) may increase the degree of confidence in the belief that a memory is accurate and not a mere imagination (*e.g.* Greenberg and Knowlton 2014), although such beliefs may be false, and although there also is evidence that dissociates

3 On the other hand, aphantasics typically report the lack of imagery in multiple modalities, suggesting that there may be some kind of underlying faculty tying these together, but this may be an artifact of reporting. Perhaps, there are many people who lack just one or two kinds of imagery and who never realized that because those kinds of imagery are less obvious, or because the lack of just one or two kinds of imagery doesn’t seem particularly noticeable. Or perhaps only people who lack object imagery, the paradigmatic kind of imagery, realize that they are lacking something.

believing and re-experiencing through imagery (*e.g.* Scobordia *et al.* 2014; Scobordia & Pascal 2016).

If episodic memory or even episodic imagination is not a singular faculty but a loose collection of interacting faculties many of which have other functions as well, then trying to explain the evolution of episodic memory is misguided and it is more useful to look for the evolutionary advantages of the members of that loose collection instead. In other words, the question shouldn't be about the evolutionary advantages of episodic memory, but about the evolutionary advantages of modal memory, personal memory, and affective memory. Answers to these questions may partly depend on inter-species comparisons.

Re-play in rats (*e.g.* Buhry, Azizi, & Cheng 2011) suggests that rats – and probably many other non-human animals – have modal memory (and possibly other kinds of modal imagination), and the ability of some animals to form (however rudimentary) concepts (*e.g.* Zentall *et al.* 2008), suggests that they have some kind of (perhaps, primitive) amodal memory as well. Whether some non-human animals have personal and/or affective memory as well is more difficult to assess. Certainly, there are animals that appear to be emotionally affected by incidents that appear to bring back memories – elephants come to mind – but affective memory is not a storage of memories that may emotionally affect in the right circumstances, but a kind of memory that we are inherently emotionally attached to (because its content defines ourselves, for example – see above), and I'm not aware of any research showing anything like *that* in non-human animals. (But neither do I have a clue on how that even could be shown.)

Given that modal memory appears to be more widespread among animals, asking for its evolutionary advantages relative to amodal memory may be getting things backwards. Most likely, modal memory is the older, more evolutionary basic form of memory, and amodal memory grew out of classification and concept formation based on modal experience and modal memory – that is, out of something very much like (b) in table 3. In other words, asking for the evolutionary advantage of modal memory is like asking for the evolutionary advantage of memory in general. A related, but different question is why humans have *retained* modal memory after developing amodal memory, considering that the experience of aphantasics and people with SDAM show that you can do without the former. The obvious answer is that modal memory is not a *disadvantage*, and that having both modal and amodal memory almost certainly gives an advantage. Aphantasics have significantly worse memories for things that cannot be easily captured in words, such as faces, for example, and people with vivid imagery remember more details (*e.g.* Vannucci *et al.* 2016; see also section 5 above). (On the other hand, lacking modal imagination (*i.e.* mental imagery) – and thus modal memory – may also be an advantage, considering that many mental illnesses involve intrusive mental imagery. *E.g.* Hackman 1998.)

From an evolutionary perspective, modal memory is not the most interesting aspect of the episodic memory construct. If we – or most of us, at least – share modal memory with many kinds of non-human animals, but (probably) not personal and/or affective memory, then the last two should be the focus of attention. Discussing theories about possible evolutionary advantages of those is well beyond the scope of this paper, however. (I doubt that either faculty has any evolutionary advantage actually, and suspect them to be by-products of other mental capacities, but I won't offer an argument for this idea.)

Let's say that you ask me "What is the capital of South Africa?" "I don't remember," I might reply, "oh wait, I *do* remember – it's Johannesburg."

I'd be mistaken. According to proponents of the semantic/episodic memory distinction, there is a distinction between *knowing* something and *remembering* something. Factual or semantic information – like the names of capital cities – is something you know. Remembering, on the other hand, involves re-experiencing or re-living (Klein 2015 is particularly emphatic about this). Thus, unless I somehow re-lived the experience of learning that Johannesburg is the capital of South Africa, I did not actually *remember* that Johannesburg is the capital of South Africa, but rather, I *knew* that Johannesburg is the capital of South Africa.

But Johannesburg is *not* the capital of South Africa so that can't be right either. (Strictly speaking, South Africa doesn't have a capital. Less strictly speaking, it has three, but Johannesburg isn't one of those.) "Knowing" – as it is normally understood – involves truth. One cannot *know* something that isn't true, so I cannot have *known* that Johannesburg is the capital of South Africa.

Hence, in the knowing/remembering dichotomy, one term, "remembering", is confusingly restricted relative to ordinary use (to exclude remembering facts), while the other, "knowing", is confusingly relaxed (to include falsehoods). If this jumble isn't bad enough, it also has the apparently absurd implication that some otherwise perfectly normal people – namely, those with SDAM and/or aphantasia – never remember anything in their life.

The answer to the question that is this paper's title – What is it like to remember something? – is "It depends". It depends on the person who does the remembering and on her abilities, and it depends on the kind(s) of memory involved. And – as illustrated by the preceding paragraphs – it depends on how we define "remembering".

It is a common, but dangerous bias to assume that others think, belief, feel, desire, or *remember* as one does oneself. (There are unpleasant historical precedents for calling those who differ in one or more of these respects "hysterics".) The episodic memory construct, however, depends very much on the assumption that everyone remembers in pretty much the same way. Particularly, it assumes that everyone has a kind of memory that is simultaneously modal (*i.e.* involving mental imagery), personal, and affective, but the experience of aphantasics and people with SDAM shows this isn't the case: aphantasics experience no mental imagery, and people with SDAM do not "re-live" memories.

Consequently, episodic memory is not a natural kind. Rather, it is an ill-defined, loose collection of a number of mental faculties that may – moreover – have other functions beside memory. Ignoring these other functions, episodic memory combines modal, personal, and affective memory. As revealed by the occurrence of aphantasia and SDAM, as well as other empirical evidence, these three are independent kinds of memory, however, and do not necessarily come together, even if they often do.

Episodic memory is not the only influential notion in memory research that depends overly heavily on the personal (first-person) experiences of researchers and a lack of willingness to take other (second- or third-person) experiences into consideration. Explanations of the nature of "auto-noetic consciousness", for example, which is sometimes mentioned as a defining aspect of episodic memory, rarely get much more concrete than the suggestion that it "confers a special phenomenal flavour to remembering" (Tulving & Kim 2009: 96). Such vague descriptions are all too common in the field. They appear to be tolerated

due to the widely shared belief that we all experience our memories and related mental events in roughly the same ways.

Both the construct of episodic memory and the more general state of conceptual disarray in the field of memory research are the product of an *everyone-thinks-like-me bias*. It is that bias that leads to the assumption that clear definition of key concepts of memory are unnecessary (because supposedly everyone experiences the same mental phenomena and vague hints are, therefore, sufficient). It is that bias that leads to the neglect of different experiences and perspectives. And it is that neglect that lead to the false construct of episodic memory.

Aphantasics and people with SDAM lack episodic memory indeed, but only because there is no such thing as episodic memory.

references

- Barsalou, Lawrence W. (2009). "Situating Concepts", in Philip Robbins & Murat Aydede, *The Cambridge Handbook of Situated Cognition* (Cambridge: Cambridge UP), 236-263.
- Basso, Anna, Edoardo Bisiach, & Claudio Luzzatti (1980). "Loss of Mental Imagery: A Case Study", *Neuropsychologia* 18: 435-442.
- Buhry, Laure, Amir H. Azizi, & Sen Cheng (2011). "Reactivation, Replay, and Preplay: How it Might All Fit Together", *Neural Plasticity*, Article ID 203462.
- Carruthers, Peter (2011). *The Opacity of Mind* (Oxford: OUP).
- Chen, Hung-Yu, Adrian W. Gilmore, Steven M. Nelson, & Kathleen B. McDermott (2017). "Are There Multiple Kinds of Episodic Memory? An fMRI Investigation Comparing Autobiographical and Recognition Memory Tasks", *The Journal of Neuroscience* 37.10: 2764-2775.
- Davidson, Donald (1999). "Reply to Barry Stroud", in L.E. Hahn (Ed.), *The Philosophy of Donald Davidson* (Chicago: Open Court), 162-166.
- Dennett, Daniel (1992). "The Self as a Center of Narrative Gravity," in F.S. Kessel, P.M. Cole & D.L. Johnson (eds.), *Self and Consciousness: Multiple Perspectives* (Lawrence Erlbaum), 103-115.
- Dennett, Daniel (2002), "Does Your Brain Use the Images in It, and if so, How?", *Behavioral and Brain Sciences* 25: 189-190.
- Engelbert, Mark & Peter Carruthers (2010). "Introspection", *WIREs Cognitive Science* 1.2: 245-253.
- Faw, Bill (2009). "Conflicting Intuitions May be Based on Differing Abilities: Evidence from Mental Imaging Research", *Journal of Consciousness Studies* 16.4: 45-68.
- Galton, Francis (1880). "Statistics of Mental Imagery", *Mind* 19: 301-318.
- Greenberg, Daniel & Barbara Knowlton (2014). "The Role of Visual Imagery in Autobiographical Memory", *Memory & Cognition* 42.6: 922-934.
- Hackman, Ann (1998). "Working with Images in Clinical Psychology", in A.S. Bellack & M. Hersen (Eds.), *Comprehensive Clinical Psychology*, Volume 6: 301-318.
- Hohwy, Jakob (2011). "Phenomenal Variability and Introspective Reliability", *Mind & Language* 26.3: 261-286.
- James, William (1890), *Principles of Psychology* (New York: Holt).
- Johnston, Mark (2010). *Surviving Death* (Princeton UP).
- Keogh, Rebecca & Joel Pearson (*in press*). "The Blind Mind: No Sensory Imagery in Aphantasia", *Cortex*.
- Klein, Stanley B. (2015). "What Memory Is", *WIREs Cognitive Science* 6: 1-38.
- Kosslyn, Stephen M. (1994). *Image and Brain: The Resolution of the Imagery Debate* (Cambridge MA: MIT Press).
- Logie, Robert H., Cyril R. Pernet, Antimo Buonocore, and Sergio Della Sala (2011). "Low and High Imagers Activate Networks Differentially in Mental Rotation", *Neuropsychologia* 49: 3071-3077.

- Michaelian, Kourken (2016), *Mental Time Travel: Episodic Memory and Our Knowledge of the Personal Past* (Cambridge: MIT Press).
- Palombo, Daniela J., Claude Alain, Hedvig Söderlund, Wayne Khuu, & Brian Levine (2015). "Severely Deficient Autobiographical Memory (SDAM) in Healthy Adults: A New Mnemonic Syndrome", *Neuropsychologia* 72: 105-118.
- Reisberg, Daniel, David G. Pearson, & Stephen M. Kosslyn (2002), "Intuitions and Introspections about Imagery: the Role of Imagery Experience in Shaping an Investigator's Theoretical Views", *Applied Cognitive Psychology* 17.2: 147-160.
- Renoult, Louis, Patrick S.R. Davidson, Daniela J. Palombo, Morris Moscovitch, & Brian Levine (2012). "Personal Semantics: at the Crossroads of Semantic and Episodic Memory", *Trends in Cognitive Sciences* 16.11: 550-558.
- Schwitzgebel, Eric (2002). "How Well do We Know Our Own Conscious Experience? The Case of Visual Imagery", *Journal of Consciousness Studies* 9.5-6: 35-53.
- Schwitzgebel, Eric (2008). "The Unreliability of Naive Introspection", *Philosophical Review* 117.2: 245-273.
- Schwitzgebel, Eric (2011). *Perplexities of Consciousness* (Cambridge MA: MIT Press).
- Schwitzgebel, Eric (2012a). "Self-Ignorance", in Jeeloo Liu & John Perry (Eds.), *Consciousness and the Self: New Essays* (Cambridge: Cambridge UP), 184-197.
- Schwitzgebel, Eric (2012b). "Introspection, What?", in D. Smithies & D. Stoljar (Eds.), *Introspection and Consciousness* (Oxford: OUP), 29-47.
- Scoboria, Alan, Amina Memon, Julie Gawrylowicz, & Andrew Clark (2015). "Nonbelieved Memories across the Adult Lifespan", *Psychology of Consciousness: Theory, Research, And Practice* 2.4: 461-474.
- Scobordia, Alan & Lisa Pascal (2016). "Dissociating Appraisals of Accuracy and Recollection in Autobiographical Remembering", *Journal of Experimental Psychology: Learning, Memory, and Cognition* 42.7: 1068-1077.
- Tulving, Endel (1972). "Episodic and Semantic Memory", in E. Tulving & W. Donaldson (Eds.), *Organization of Memory* (New York: Academic Press), 381-403.
- Tulving, Endel (1983). *Elements of Episodic Memory* (Oxford: Clarendon).
- Tulving, Endel & Alice S.N. Kim (2009). "Autonoetic Consciousness", in: T. Bayne, Alex Cleeremans, & Patrick Wilken (Eds.), *The Oxford Companion to Consciousness* (Oxford: OUP), 96-98.
- Vannucci, Manila, Claudia Pelagatti, Carlo Chiorri, & Giuliana Mazzoni (2016). "Visual Object Imagery and Autobiographical Memory: Object Imagers are Better at Remembering Their Personal Past", *Memory* 24: 455-470.
- Watkins, Nicholas W. (*in press*). "(A)phantasia and Severely Deficient Autobiographical Memory: Scientific and Personal Perspectives", *Cortex*.
- Wheeler, Mark A. (2000). "Episodic Memory and Autonoetic Awareness", in E. Tulving & F.I.M. Craik (Eds.), *The Oxford Handbook of Memory* (Oxford: OUP), 597-608.
- Wiggs, Cheri L., Jill Weisberg, & Alex Martin (1998), "Neural Correlates of Semantic and Episodic Memory Retrieval", *Neuropsychologia* 37.1: 103-118.
- Zeman, Adam (2017). "Eye's Mind Research – an Update". <http://medicine.exeter.ac.uk/research/healthresearch/cognitive-neurology/theeyesmind/outputsandactivities/update2017/> (last accessed: October 6, 2017).
- Zeman, Adam, Michaela Dewar, & Sergio Della Sala (2015). "Lives without Imagery – Congenital Aphantasia", *Cortex* 73: 378-380.
- Zeman, Adam, Sergio Della Sala, L.A. Torrens, V.E. Gountouna, D.J. McGonigle, & R.H. Logie (2010). "Loss of Imagery Phenomenology with Intact Visuo-Spatial Task Performance: A Case Study of 'Blind Imagination'", *Neuropsychologia* 48: 145-155.
- Zentall, Thomas R., Edward A. Wasserman, Roger K.R. Thompson, & Mary Jo Ratterman (2008). "Concept Learning in Animals", *Comparative Cognition & Behavior Reviews* 3: 13-45.