**Imagination, Creativity, and Aphantasia**

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**Abstract:** This chapter focuses on the role of the imagination in creativity, using aphantasia as a case study. It first distinguishes between imagination and mental imagery, before giving an overview of what we know about aphantasia to date, focusing in particular on findings pertaining to creativity, imagination, and memory. It then turns to the role of the imagination in creativity, agreeing with philosophers that the imagination plays an essential role in creativity, which allows individuals to imagine a multitude of possibilities. This view is then supplemented with a theory of the neuro-cognitive underpinnings of the imagination, whereby both the imagination and memory are supported by the same neural network – the default mode network. Finally, the chapter argues that this fuller picture allows us to understand the creative abilities of people with aphantasia, thoroughly resisting the thought that they might generally be *unimaginative* or *uncreative*.

**Keywords:** aphantasia, imagination, mental imagery, creativity, episodic memory, default mode network

**1. Introduction**

Aphantasia is commonly called “blind imagination”. It involves a cluster of individual differences[[1]](#footnote-1) in mental imagery, episodic memory, and imagination. People with aphantasia generally have a reduced ability to produce mental imagery, sometimes in all modalities, and sometimes both voluntarily and involuntarily (Dawes et al. 2020). They also report having worse autobiographical memory (Zeman et al. 2020), and produce fewer details than average about imagined or remembered scenarios (Dawes et al. 2020). For example, a person with total aphantasia would not be able to generate any visual imagery given a specific cue (“imagine what your mother looks like”), even though they are able to think of the content. They might also experience their memory of autobiographical events as poor and generate few sensory details about a future imagined event. Given how prominently people refer to mental imagery and imagination as sources of creativity, one might think that having aphantasia should imply a reduced creative ability. But people with aphantasia quickly disprove this point, with works of art created by people with aphantasia being exhibited at art exhibitions (MacKisack et al. 2022), and multiple authors and visual artists self-ascribing as having aphantasia.[[2]](#footnote-2) This should make us question the relationship between mental imagery, imagination, and creativity.

In this chapter, I want to use aphantasia as a case study to emphasise the use of *the imagination*, not mental imagery, in creativity. I will start by drawing some preliminary distinctions between mental imagery and imagination, which will help us navigate the topic. Secondly, I will give a brief overview of what we know about aphantasia to date, focusing in particular on findings pertaining to creativity, imagination, and memory. Thirdly, I will consider the essential role of imagination in creativity, homing in on a particular view which captures it well within both the arts and natural sciences (Hills and Bird 2019). According to this view, the imagination allows individuals to imagine a multitude of possibilities, constrained by their tradition, and this is part of what makes up a creative disposition. But this view does not tell us how imagination is able to perform this function, and hence, fourthly, I will supplement it with a theory of the cognitive and neural underpinnings of the imagination, whereby both the imagination and memory are supported by the same neural network – the default mode network (Beaty, Seli, and Schacter 2019; Schacter and Addis 2007). This explains how individuals can flexibly draw on episodes from their past, as well as concepts and facts, to recombine these into imaginings of what would be possible. Finally, putting it together, I will argue that this makes sense of the creative abilities of people with aphantasia, thoroughly resisting the thought that they might be *unimaginative* or *uncreative*. I will suggest that going forward, we should further our understanding of the diverse realm of creativity by a more thorough investigation into the creative abilities of people with aphantasia.

**2. Imagination and Mental Imagery**

Let us first think about the role of mental imagery in creativity. It is easy to think that creating a mental image is a necessary step in a creative process. For example, when creating a painting, an artist will often first picture something in their mind and manipulate this mental representation, before putting anything down on a canvas. But, as noted by MacKisack et al. (2022), this is not the only way of composing a work of art. They point out that a work of art could be composed either internally or externally. Artists who compose internally are often vivid imaginers and first compose an artwork in their mind’s eye. This way of composing relies on first producing a mental image, and allows the artist to manipulate this in various ways, before turning to the external media. As an example, one artist describes that they “carry a picture in [their] mind for a long time before [they] paint it, maybe for a year” (Roe 1975) and another that they “spend hours over days or months composing the whole piece in [their] mind […] before [they] put it down on paper” (reported by artist MEC in MacKisack et al. 2022). But other artists compose their artwork externally. An external way of composing relies on manipulating the external media without having a preconceived image of what one is trying to achieve. This might be a common way for artists with aphantasia to compose their works of art, a hypothesis that MacKisack et al. (2022) investigated using qualitative interviews. To take an example, an artist with aphantasia describes that they “often start a picture with no intention and certainly no end goal; it materializes in an improvisatory way” (artist MC as reported in MacKisack et al. 2022). Hence, this study thus suggests that mental imagery is not a necessary component of a creative process, but rather that there are different ways that one can compose artworks, depending partly on one’s visual imagery abilities.[[3]](#footnote-3)

Mental imagery might not be necessary for creativity, but what of imagination? Philosophers normally draw a distinction between mental imagery and imagination, whereby mental imagery is an ingredient in sensory imagination but not in propositional imagination (Currie and Ravenscroft 2002; but see Kind 2001 for an influential image-based account of imagination, and Kind 2022 for the view that propositional imagination can include mental imagery). Propositional imagination involves manipulating concepts, often in novel ways, and allows us to imagine hypotheticals, such as that Paris is not the capital of France. On the contrary, sensory imagination does involve mental imagery. For example, a sensory imagining of being in Paris could involve creating mental imagery of the look of the streets, the smell of fresh baguettes, and the sound of French being spoken. As we will see in the next section, though this distinction is not normally applied by researchers who study aphantasia, studies have in fact investigated both sensory imagination and propositional imagination. I will argue that in order to shed light on the creative abilities of people with aphantasia, we ought to focus on the findings relating to propositional imagination. But before I get there, we need to know more about aphantasia.

**3. Aphantasia**

Research on aphantasia has taken off in the last decade, after its naming in 2010 by Adam Zeman (Zeman et al. 2010). At this point, Zeman reported on an individual who had completely lost his ability to create conscious visual imagery following an operation – so-called acquired aphantasia. After this, research into congenital aphantasia – aphantasia present from birth – has greatly increased and now represents the majority of the studies.[[4]](#footnote-4) The term “aphantasia” now covers not only reductions in visual imagery but in any kind of imagery (e.g., visual, auditory, tactile, gustatory, olfactory, kinaesthetic, and emotional)(Monzel et al. 2022), and there are also individuals with multisensory aphantasia (Dawes et al. 2020; Zeman et al. 2020), as reported for example in a study by Dawes et al. (2020) who studied 267 participants to establish a cognitive profile of aphantasia. They found that 26% of individuals with aphantasia reported a total absence of multisensory imagery (auditory, tactile, emotion, taste, olfactory, and kinaesthetic). They also found that individuals with aphantasia reported significantly fewer night-time dreams (involuntary imagery) than controls, and the dreams reported contained fewer sensory details. Despite the possibility of aphantasia existing in multiple modalities, visual aphantasia (aphantasia in the visual modality) is most commonly investigated, and so far no studies have investigated individuals who have only a non-visual type of aphantasia.

Central to the study of aphantasia is a question about how one’s mental imagery abilities ought to be assessed. In current studies, an individual’s voluntary visual imagery abilities are normally assessed by using the Vividness of Visual Imagery Questionnaire (VVIQ) (Marks 1973; 1995), though the use of this measure to identify people with aphantasia has recently received criticism as it is not a tool developed for this purpose (Blomkvist and Marks 2023). This questionnaire asks individuals to try to create a visual image of various scenes, such as a familiar person or a shopfront. They are then asked to rate this image on a scale for how vivid it is, ranging from 1 to 5, where the extremes are “no image at all, you only ‘know’ that you are thinking of an object” and “perfectly clear and as vivid as normal vision”. When it comes to the study of aphantasia, most studies delineate aphantasia by scoring close to the bottom of the scale (this means scoring a 1 or 2 for most questions). The vividness ratings of people classified as having aphantasia thus correspond to “no image at all, you only ‘know’ that you are thinking of an object” or “vague and dim”. But visual imagery abilities can also be assessed by using objective measures, though this is less common in studies. For example, Keogh and Pearson (2018) have found differences in priming effects due to visual imagery on a binocular rivalry test, another study has found that differential pupillary light response between people with aphantasia and controls (Kay et al. 2022), and yet another study have found differences in skin conductance levels in a fear-based imagery paradigm (Wicken, Keogh, and Pearson 2021). Nonetheless, the VVIQ is the most common measure. Using this to estimate the prevalence of aphantasia in the general population, Dance et al. (2022) tested 501 individuals and found a prevalence of 1% reporting the lowest score on the VVIQ, and 3.2% reporting “vague and dim” imagery. Other studies have found similar results, such as Faw et al. (2009) who reported that 2.1% of 750 tested participants has no imagery at all; and Zeman et al. (2020) who tested 1288 individuals and reported no imagery in 0.7% of the sample, and low imagery in 2.1% of the sample (note that Zeman et al.’s study uses a different cut-off point on the VVIQ, which could account for the difference in prevalence found compared to Dance et al. (2022)).

But though many researchers focus on characterising aphantasia primarily as a reduction in visual or multisensory imagery, there are other prominent characteristics too, such as differences in episodic memory (Blomkvist 2022a). “Episodic memory” refers to our ability to recall autobiographical events, where these tend to involve sensory, spatial, and temporal information (Tulving 1983; 1972). Commonly, episodic memory is also accompanied by a sense of reliving the past event, and often also by mental imagery of the event. A few studies have focused on testing the episodic memory abilities of people with aphantasia, and have found that they do not have as sensorily rich autobiographical memory as individuals without aphantasia (Bainbridge et al. 2020; Dawes et al. 2020; 2022; Milton et al. 2021; Zeman et al. 2020). For example, Milton et al. (2021) used the Autobiographical Interview (Levine et al. 2002), an interview where participants are asked to elaborate on various past life events, and which scores each response based on the number of internal details (sensory details, time, place) and external details (narrative, factual statements, metacognitive statements). They found that, compared to controls, participants with aphantasia reported significantly fewer internal details, but not significantly fewer external details. These kinds of findings have motivated the theory that aphantasia is more likely to be the result of processes in the episodic system, and less likely to be the result of processes in the visual system (Blomkvist 2022a).

Finally, and perhaps most pertinent to the topic of this chapter, there have been interesting studies on aphantasia and propositional imagination. Milton et al. (2021) tested the ability of people with aphantasia to propositionally imagine both atemporal and future events. In the atemporal task, participants were asked to elaborate on three different scenarios (e.g., imagining standing in a street market). In the future task, they were asked to imagine three possible future events (e.g., a possible Christmas event). For both tasks, they were asked to provide as much detail as possible. Results showed that people with aphantasia produced significantly fewer details than controls in both tasks. Similarly, a study by Dawes et al. (2022) compared the quantity and quality of details generated in both memory and imagination between people with aphantasia and controls. In this experiment, participants were asked to remember six autobiographical events and imagine six possible future life events in response to a cue word (e.g., “garden”). These events were written down by participants and later scored for quality and type of details. Results showed that there were no differences when it came to the number of external details provided by either group, but that people with aphantasia provided significantly fewer internal details than controls. Within the aphantasia group, participants also provided significantly fewer details when it came to imagining future scenarios compared to remembering past scenarios. Hence, we can see that aphantasia is not only characterised by a reduced mental imagery capacity, but also by reduced details in memory and imagination. Thus far, though this correlation has been reported by multiple studies, the causal relationship remains to be investigated.

But do these findings imply that people with aphantasia are unimaginative or uncreative? This is a question we can make headway on now. What I want to do in the rest of this chapter is to demonstrate that an investigation into the role of imagination in creativity renders this worry misguided; creativity is more diverse than we might think.

**4. The Place of Imagination in Creativity**

Several accounts of creativity put imagination at their centre (Stokes 2016; Gaut 2003; Kind 2022; Hills and Bird 2019). I will here focus on a recent account by Hills and Bird (2019) in order to illustrate the way in which imagination plays a role, which will then be supplemented with details of the neural underpinnings in the next section. Hills and Bird argue that creativity is the set of linked dispositions of an individual to have novel ideas (*originality*), generated by the imagination (*imagination*), which are many and varied (*fertility*), and that the individual carries through these ideas to completion (*motivation*).[[5]](#footnote-5) These novel ideas could relate to any domain, such as the arts, mathematics, philosophy, engineering, or science. The important thing is that they must be produced by the imagination, rather than anything else. To demonstrate, Hills and Bird recount Kieran’s (2014) hypothetical case of a stroke victim who tries very hard but is unsuccessful at writing. Incidentally, he produces beautiful abstract patterns. This, according to Hills and Bird, is not a case of creativity, as the production of the abstract patterns is not a result of an imaginative process but merely accidental (see Gaut 2003 for a similar example). Moreover, to have a creative disposition, a person also needs to have many and varied ideas – it is not sufficient that one’s imaginative processes produce the same idea over and over again. An example would be the many and varied ideas of Leonardo da Vinci which are regarded as creative. And finally, the ideas generated by the imagination must also be carried through to completion; as Hills and Bird succinctly put it, creativity is not merely an ability, but a person must have the “urge to create” (Hills and Bird 2019, 700).

Let’s delve further into what they say about the imagination. Its importance derives from the fact that a “central function of the imagination is that it enables one to scan, consciously or unconsciously, some subset of the space of relevant possibilities. In short it allows one to see possibilities” (Hills and Bird 2019, 696; for similar points, see Gaut 2003; and Stokes 2016). That is to say, when a person uses their imagination, they are able to tap into not only what is actual in front of them, but what is possible. For example, a poet could use their imagination to imagine possible metaphors in a poem, or a scientist could imagine what would follow from different axioms of a theory. Moreover, imagination can work in both deliberate and spontaneous ways. For example, a scientist can deliberately spend time developing a complex theory, and thereby exercise their imagination by considering possible ways in which the theory could be cashed out. But other times, imagination can spontaneously generate ideas, such as when a writer is suddenly struck by an ingenious way of phrasing a sentence or when an idea comes to you whilst you are doing something completely different. The bottom line is that in all of these cases, the imagination enables a person to see what something *could* be like.[[6]](#footnote-6) Imagination further often produces many scenarios of what something could be like, which allows a person to consider and evaluate these before choosing one to execute. Consider an engineer who is designing a bridge whose design needs to satisfy multiple desiderata; the bridge needs to be able to bear a certain load, be of a certain width and height, but perhaps also be aesthetically pleasing or follow in a certain tradition of architectural design. A creative engineer would be able to come up with multiple possibilities that fulfil these desiderata, and could evaluate these according to the desiderata to settle on the most optimal design.

Importantly, the content generated by the imagination does not come out of nowhere. The imagination is guided and constrained by the agent’s being embedded in a certain kind of tradition, which guides the kinds of possibilities they conjure up. We do not simply imagine all the possibilities in logical space. The idea of constraining imagination in various ways has been noted elsewhere too, especially by philosophers arguing imagination is a skill which can be controlled and improved (Kind 2016; 2020; Blomkvist 2022b). For example, an imaginer could intend to realistically imagine what would happen if they quit their day job and followed their dream of becoming a singer. How well they execute this imagining will depend on their skill as an imaginer, much like how well one could run 100 metres depends on one’s skill as a runner (Fridland 2021; 2014). They can intentionally constrain their imagining by trying to imagine realistically, or by intending to imagine that aspects of their lives would change in relevant ways (Kind 2016). We can thus see that imagining can be constrained in multiple ways, either by the imaginer or by social traditions. In previous work (Blomkvist 2022b), I have argued that the content of an imagining comes from information stored in the memory system, and that when a skilled imaginer chooses an imaginative project, this guides how the memory system selects relevant information to be recombined into a novel imagining.

But to further understand how imagination works to generate possibilities constrained by one’s own imaginative project and tradition, we need a story about what is going on sub-personally when a creative individual imagines different possibilities. In order to explain why certain possibilities, rather than others, are imagined, we need to consider imagination’s place in an individual’s cognitive makeup. That is, we need to consider the cognitive architecture.

**5. The Cognitive and Neural Underpinnings of Imagination**

To understand this, we need to see how imagination relates to memory. I want to tell a story which shows that the possibilities we imagine depend on both semantic and episodic memory. Traditionally, only semantic memory – memory for concepts and facts – has been considered important for creativity, where tasks testing “divergent thinking” have been shown to rely on semantic memory (Kenett, Anaki, and Faust 2014). However, in recent years, the role of episodic memory – memory for autobiographical events containing rich sensory details – has also been emphasised for creativity (Beaty et al. 2016; Madore, Jing, and Schacter 2016; Madore et al. 2019). That is, people not only draw on conceptual knowledge in generating creative ideas, but also on their past personal experiences. At the same time, there is also a growing literature supporting the view that memory and imagination are produced by the same sub-personal system, with several theories in philosophy, psychology, and neuroscience defending this view. In philosophy, this goes under the name of *simulationism* (Michaelian 2011; 2016; Perrin and Michaelian 2017), and in psychology and neuroscience it is widely known as *constructive memory* or *the* *constructive episodic memory hypothesis* (Schacter and Addis 2007; 2020). What I hope to do in this section is to demonstrate that analysing imagination in a constructive memory framework provides us with a sub-personal view of imagination to complement the ideas expressed philosophers who see imagination as central to creativity.

Constructive memory theories have in common a commitment to a single neuro-cognitive system which functions to produce mental representations of the past and future by combining information. Multiple processes work to encode, consolidate, retrieve, recombine, and reconsolidate information. When an event is encoded into memory, the representation is stored disparately, meaning that information needs to be recombined upon recall, which can lead to alterations in content. An experience is not normally perfectly preserved as it was experienced, and according to some, this is exactly what makes the system optimal for constructing representations of future possibilities, or “hypothetical future thought” (De Brigard 2014).[[7]](#footnote-7) Imagination also draws on these disparately stored representations and recombines information from multiple sources to create novel representations, for example of future possible scenarios or past counterfactuals. We can hence see that according to this view, memory and imagination exist on a continuum (for an overview of the debate in philosophy, see Michaelian, Perrin, and Sant’Anna 2020).

Why should we believe that memory and imagination are two sides of the same (neuro-cognitive) coin? I will reiterate two arguments for the view, one from considering clinical populations, and one from considering non-clinical populations. Firstly, multiple studies have observed that in clinical populations, impairments in autobiographical episodic memory co-occur with impairments in future imagination. The ability to encode and recall episodic memories is impaired in conditions such as episodic amnesia, and studies have documented how this impairment co-occurs with an impairment to form future imaginings. For example, Rosenbaum et al. (2005) report on patient K.C who suffered a total loss of episodic memory following a motorcycle accident. But K.C was also unable to produce any descriptions of his personal hypothetical future, either in the close future (this afternoon), or far future (next summer). When asked to think about his personal future, he responded that his mind was “blank”. That is, he was unable to imagine what he might do in the future. A similar case is reported by Klein and Loftus (2002) who document patient D.B, who suffered a complete loss of episodic memory following a cardiac arrest. D.B was similarly tested on questions pertaining to the past or future (“what did you do yesterday?”, “What are you going to do tomorrow?”). These questions revealed that D.B was highly impaired both on the past and future versions of the task with only 2/10 responses concerning the imagined future judged as correct (as assessed by family members). Further, Hassabis et al. (2007) studied a larger sample of five patients with bilateral hippocampal amnesia, who were asked to construct an imaginary experience (e.g., “imagine that you are lying on a white sandy beach in a beautiful tropical bay”) and narrate this. Experimenters scored the narratives on content, spatial coherence, and subjective quality. When comparing these to controls, results showed that patients with amnesia provided narratives which were significantly reduced in richness and content. Taken together, these studies show that an impairment producing episodic memory content co-occurs with an impairment to produce content in future imaginings, which supports the hypothesis that these functions rely on the same system.

The hypothesis is also supported by evidence from non-clinical populations, and this particularly sheds light on the significance of the recombination process in producing novel imaginings. In an influential new paradigm, Addis et al. (2009) first asked participants to recall personal experiences from the last 5 years, which all had to involve a person other than themselves, an object, and a place. This way, they collected 170 memory descriptions from each participant. Details from these memories were then extracted by the researchers to create cues for asking participants to either imagine a past event, imagine a future event, or recall a past event. For example, to create a novel cue, the object and place could be extracted from one memory description, but the person from a different memory description. Participants were then scanned in an fMRI scanner as the cues were presented on a screen along with an instruction (imagine past event, imagine future event, or recall past event). As any movement (such as moving one’s mouth when speaking) creates noise in fMRI data, participants were requested to silently elaborate on a cue as much as possible in their mind. Immediately after the fMRI session, they received the cues again, and at this point they were asked to recount out loud what they had imagined/recalled. The reason this study is particularly interesting is that it not only asks participants to recombine details, but it also investigates which brain areas underwrite this ability. Results showed that there were significant overlaps in the brain areas recruited for all the three tasks, which indicates that the same recombination process operates on retrieved information, regardless of whether this is in service of memory or imagination. The network involved, dubbed the *default mode network*, involves areas in the frontal cortex, temporal cortex, and hippocampus, amongst others.

But similar studies have also found some differences; in particular, semantic memory seems to be recruited to a larger extent in imagination paradigms (Irish et al. 2012; Irish and Piguet 2013). In a way, this should come as no surprise given that the role of semantic memory in imagination has been well established in creativity research. For example, in an fMRI study by Fink et al. (2015), brain areas known to be related to semantic memory became more active as a result of training on verbal creative tasks. These tasks involve word generation from a cue (come up with as many words as possible including the syllable DE), coming up with slogans (generate a slogan for the new product “orange-ice cream”), or generating sentences with some given words (e.g., generate a sentence with the words “car-fish-book”) (Fink et al. 2015). The contribution of semantic memory to the construction of past and future scenarios has also been investigated in clinical populations with semantic dementia (Irish et al. 2012). Here, a test based on Addis et al.’s (2009) recombination paradigm was used, where participants were asked to generate past or future events based on a cue simultaneously presented as a word and an image (e.g., “toy”). Participants were asked to either remember past experiences from their own lives, or generate future possible experiences for the next year. Results showed that, compared to controls, participants with semantic dementia showed significant impairments for future thinking, where they produced significantly fewer details about potential future experiences, and fMRI analysis further indicated that the semantic memory network was implicated in this.

There are numerous outstanding questions regarding the relationship between memory and imagination, such as to what extent semantic and episodic memory differ or to what extent memory can be said to preserve representations, but these questions will not need an answer to make headway on the question I am interested in here.[[8]](#footnote-8) Though the particulars of this story are messy, there is a clear take-home message: memory and imagination draw on the same sub-personal resources, where these are geared towards flexibly recombining stored information.

**6. Aphantasia and Creativity Revisited**

It should be fairly straightforward to see how this account of constructive memory relates to the role of imagination in creativity. As we saw, philosophers argue that imagination allows the creative individual to consider various possibilities commensurable with the tradition they work in. With the sub-personal account in place, we can elucidate this process. When a creative individual uses their imagination, their memory system searches through stored content, and retrieves relevant bits of content to recombine into a new representation.[[9]](#footnote-9) If one is a skilled imaginer, one’s project will be constrained in certain ways meaning that one is more likely to come up with a good solution. Hills and Bird give a nice example of the scienentist Coloumb to illustrate this. When Coloumb was devising a theory of the forces of attraction, his imaginative project was constrained by his seeing the problem as analogous to Newton’s problem of gravitation. This is what biased his memory system to retrieve certain bits of information, and not others, and recombine these into what eventually became his proposed solution. We can see that this account explains the fact that an individual can generate a myriad of novel ideas, as there is a vast amount of information which imagination can draw on.

With this in place, what can we say about creativity and aphantasia? Recall that studies have shown that people with aphantasia recall fewer internal details from memories (roughly, episodic details), and produce fewer internal details in imagination, compared to controls. Recall also that this is not the case for external details (roughly, semantic details), where they produce the same level of details as controls. It might be tempting from this evidence to conclude that people with aphantasia would be likely to be less creative than others, as this seems to be the implication of the constructive memory account which emphasizes that imagination draws on episodic details. However, this conclusion cannot be inferred from the evidence, for the following reason. Having a creative disposition does not merely concern *how many* details are generated, but rather how these details are *recombined*. To prove the point, we could imagine an individual who generated new scenarios with a multiplicity of details, but that these only differed by a tiny degree. Compare this to an individual who generates scenarios with fewer details, but these are comparatively more diverse. Intuitively, the second individual is more creative (all else being equal). Indeed, an experiment in which participants were given different instructions (“be creative” or “be fluent”) demonstrates this point (Nusbaum, Silvia, and Beaty 2014). Participants who were given the instruction to “be creative” generated fewer ideas, but these were judged to be more creative, whereas participants who were given the instruction to “be fluent” generated a lot of ideas, but these were less creative.

Crucially, in the case of aphantasia, we have so far only found a difference in the *number* of internal details generated, but whether these details are *combined* in a creative way has not been assessed. Since the recombination of content, and not mere quantity of content, is crucial for creativity, we should not infer that people with aphantasia are any less creative than people without aphantasia. Moreover, from a surprising source of evidence we actually find indirect evidence that people with aphantasia are likely to be able to flexibly recombine details in creative ways. Zeman et al. were interested in the choices of profession of people with aphantasia, and particularly whether they worked in so-called “creative professions”. They found that people with aphantasia were more likely to work in professions such as computing, mathematics, and science. But, as we have seen, creativity in not limited to the artistic sphere, and people working in spheres such as computing, mathematics, and science, often need to be creative when it comes to problem-solving, theory-building, and hypothesis generation. Hence, the fact that we find many people with aphantasia in these professions should lead us to hypothesise that they are be as likely as others to be able to successfully combine content in creative endeavours. People with aphantasia are thus not unimaginative or uncreative, and can be found in both the arts and other professions which are likely to require a high degree of creativity.

**7. Conclusion**

In this chapter, I have taken inspiration from philosophers who have analysed creativity as a disposition which essentially involves imagination. I have shown that their account can be supplemented by a sub-personal account of how the imagination works, where I argued that one neuro-cognitive system supports both memory and imagination. This allows us to understand statements about imagining possibilities and scenarios as being generated by a system which retrieves information and flexibly recombines this in order to produce novel imaginings. This framework is highly fruitful for thinking about creativity in individuals with aphantasia. Here, I first showed that mental imagery is not necessary for creativity, as there are internal and external ways of composing works of art. The lack of mental imagery is thus not a barrier to people with aphantasia being creative. Moreover, even though studies also show that people with aphantasia generate fewer internal details for imagined scenarios compared to controls, this is also not necessarily a barrier to creativity. Indeed, we find people with aphantasia in many creative professions, where these include fields that focus on problem-solving and divergent thinking, such as science and computing, as well as artistic professions. When it comes to creativity, it is the way in which content is recombined, rather than mere quantity, that matters. In light of this, future research should investigate creativity in aphantasia more widely – not just as an ability pertaining to the arts. Finding out how content is recombined could teach us more about the diverse ways in which creative minds work; we should think outside the box.

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1. Aphantasia is often described as a “condition” (Zeman, Dewar, and Della Sala 2015). As this term has strong medical connotations which could cause stigma (Blomkvist and Marks 2023), and aphantasia does not qualify as any kind of mental disorder (Monzel, Vetterlein, and Reuter 2022), I have opted to describe it as an “individual difference”, rather than a “condition”. [↑](#footnote-ref-1)
2. For example, author John Green tweeted about his aphantasia (<https://twitter.com/johngreen/status/1708515024275189884> accessed on 25/10/2023) and ex-Pixar President and animator Ed Catmull reports on his experience as a person with aphantasia in a BBC article (<https://www.bbc.co.uk/news/health-47830256> accessed 25/10/2023). [↑](#footnote-ref-2)
3. MacKisack et al. (2022, 78) point out that they sample size here is small and unrepresentative (12 artists with aphantasia, VVIQ ≤ 23), and call for a further systematic study of a large sample of artists. [↑](#footnote-ref-3)
4. Before the term “aphantasia” was coined, this individual difference is thought to have first been studied by Galton (1883), and then extensively studied by multiple researchers during the late 20th century (for overviews, see Blomkvist and Marks 2023; MacKisack et al. 2016). However, since the term was coined, significantly more interest has been generated from both researchers and media. [↑](#footnote-ref-4)
5. In contrast to Hills and Bird’s view, other prominent accounts stress the importance of generating *valuable* ideas for creativity (Paul and Kaufman 2014; Stokes 2016). My aim here is not to provide arguments against these views (see Hills and Bird 2019). The sub-personal account of the imagination which I develop in this chapter is compatible with the view that creative outputs need also be valuable to be considered creative. Hence, an opponent of Hills and Bird’s general view who nonetheless agrees that imagination plays a role in creativity could accept the view I present here of aphantasia and creativity. [↑](#footnote-ref-5)
6. Hills and Bird take it that imagination could be accompanied by mental imagery, but need not be. [↑](#footnote-ref-6)
7. This is often taken to be a point again so-called storehouse models of memory. However, as pointed out by Robins (2020) and Schwartz (2020), storehouse models are not necessarily committed to a representation being perfectly preserved. The exact differences between the theories will not be important for my argument here. [↑](#footnote-ref-7)
8. Brain areas related to semantic memory and episodic memory are not the only ones involved in creative processes, but I have focused on these here because of their relation to imagination. For a detailed overview of networks related to creativity see: Beaty et al. 2016. [↑](#footnote-ref-8)
9. To generate creative ideas, not only does information need to be retrieved, but information *relevant* to the agent’s projects ought to be retrieved. The details of how relevant information is selected are too complex to cover here, but it has been suggested that this process is Bayesian (De Brigard 2014; Blomkvist 2022b). [↑](#footnote-ref-9)