

<b>Institution:</b> University of Glasgow (UofG)		
<b>Unit of Assessment:</b> 30 Philosophy		
<b>Title of case study:</b> Transforming self-understanding of people with aphantasia and hyperphantasia through research-based communication, engagement and community-building		
<b>Period when the underpinning research was undertaken:</b> 2012–present		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Fiona Macpherson	Professor of Philosophy	2004–present
<b>Period when the claimed impact occurred:</b> 2015–31 <sup>st</sup> July 2020		
<b>Is this case study continued from a case study submitted in 2014?</b> N		
<p><b>1. Summary of the impact</b></p> <p>Interdisciplinary collaborative research, with Fiona Macpherson contributing philosophical research expertise, has investigated the extremes of the visual imagination spectrum, e.g. the complete inability to visualise (aphantasia), and extremely vivid imagination (hyperphantasia), which each affect 2-3% of people. Effective public engagement activities prompted over 14,000 people who experience these unexplored conditions to contact the project team. These people's lived experiences have been changed, both through learning what is different about their mind from others', and from the knowledge that others are like them. Because of this, a supportive online community of interest has been established. An art exhibition, workshop and conference have supported people's changed self-awareness and built a supportive community sharing an uncommon lived experience.</p>		
<p><b>2. Underpinning research</b></p> <p>Professor Macpherson's research career has focused on the nature of perception and perceptual experience, comparing them to, and studying their interaction with, other mental processes and states. A major body of her research has been on perceptual imagination.</p> <p>Macpherson initially argued for the existence of cognitive penetration: a phenomenon whereby beliefs and desires affect perceptual experience [3.1]. One of her arguments was that known brain mechanisms could predict the existence of cognitive penetration: these mechanisms were the production of visual imagery by belief and desire, and the interaction of that visual imagery with perceptual experience. Evidence of multiple interactions between visual imagery and perceptual experience were given, drawing on psychological research and folk psychology.</p> <p>This work on the imagination also explored theories of hallucination [3.2], including the idea that hallucination is perceptual imagery being mistaken for perceptual experience. Macpherson has also explored the role of the philosophical imagination in establishing the necessary features of perceptual experience [3.3] and found that, while imagination can play a role in establishing these, the inability to imagine a certain sort of experience does not render that experience impossible.</p> <p>Macpherson added her insights from this body of work into consciousness, perceptual experience and imagination to the neurological, brain science, literary and artistic expertise of other members of Eye's Mind Project, an AHRC collaboration investigating extremes of imagination with neuroscientist Adam Zeman of the University of Exeter (UofE) as PI. Her work contributed significantly to an intellectual history of philosophical and scientific accounts of the imagination [3.4 and 3.6]. Macpherson and the team examined accounts of the imagination from the ancient Greek philosophers to the present day, and how this intellectual history has shaped</p>		

the neuroscientific investigation of the imagination [3.4]. They drew also on contemporary imagery science, including its account of the variation in capacity for visual imagination between people who lack it completely (aphantasia) and those for whom it is as vivid as seeing (hyperphantasia); considering the extent to which such science may resolve long-standing theoretical debates. The research suggests that the huge difference in theories of imagery and its role in the mind may be explained by individual variations in people's imagery.

The Eye's Mind team, including Macpherson, also carried out a meta-analysis of the neural activity associated with visual imagination [3.5]. Macpherson used her expertise to help select and deselect neuroscientific studies for the analysis. Her knowledge of the differences between types of imagery, and her insights into the functional aspect of visual imagery, and how to discern whether a person has or lacks visual imagination [3.1 and 3.4], played a key role in this work.

Macpherson's subsequent research [3.7], building on Hume's work on the 'missing shade of blue', examines how people who have never experienced visual imagery might understand what it is like. Through identifying perceptual experiences that aphantasic people do have that are in some ways similar to imaginative experience, such as dreams, afterimages and illusory experiences, she is working to help them extrapolate, and in that way come to know what visual imagery is like. Macpherson's philosophical research therefore has application in describing to those with aphantasia what it is like to have visual imagination.

### 3. References to the research

- 3.1 Macpherson, F. (2012) "[Cognitive Penetration of Colour Experience: Rethinking the Issue in Light of an Indirect Mechanism](#)", *Philosophy and Phenomenological Research*, 84(1): 24–62. [doi:10.1111/j.1933-1592.2010.00481.x](#)
- 3.2 Macpherson, F. (2013) "[The Philosophy and Psychology of Hallucination: An Introduction](#)", in *Hallucination: Philosophy and Psychology*, edited by F. Macpherson and D. Platchais, Cambridge MA: MIT Press.
- 3.3 Macpherson, F. (2015) "[The Structure of Experience, the Nature of the Visual, and Type 2 Blindsight](#)", *Consciousness and Cognition*, 32:104–128. [doi:10.1016/j.concog.2014.10.011](#)
- 3.4 MacKisack, M., Aldworth, S., Macpherson, F., Onians, J., Winlove, C., and Zeman, A. (2016) "[On picturing a candle: the prehistory of imagery science](#)", *Frontiers in Psychology*, 7: 00515. [doi:10.3389/fpsyg.2016.00515](#)
- 3.5 Winlove, C., Milton, F., Ranson, J., Fulford, J., MacKisack, M., Macpherson, F. and Zeman, A. (2018), "[The neural correlates of visual imagery: a co-ordinate-based meta-analysis](#)", *Cortex*, 105: 4–25, [doi:10.1016/j.cortex.2017.12.014](#).
- 3.6 Macpherson, F. (2018) "[Perceptual Imagination and Perceptual Memory](#)", in Dorsch, F. and Macpherson, F. (eds.) *Perceptual Imagination and Perceptual Memory*, Oxford University Press. ISBN 9780198717881 [available on request from HEI]
- 3.7 Macpherson, F. (2019) "[What is it Like to Have Visual Imagery?](#)" in S. Aldworth and M. MacKisack (eds.) *Extreme Imagination: Inside the Eye's Mind*. London: University of Exeter.

**Quality:** these outputs have all been peer-reviewed and the research is expected to meet or exceed the 2\* threshold.

#### 4. Details of the impact

As a philosopher of perceptual experience, one of Macpherson's key contributions to the Eye's Mind project was an ability to convey something of the experience of visual imagination to those who have not experienced it. Professor Zeman noted that Macpherson's expertise '*contributed significantly to the shape and approach taken on the project*' adding that Macpherson made an important contribution to all three strands of the project, as well as being '*enthusiastically involved in the public-facing activities*' [5.1].

##### 4.1 Impacts on self-understanding of those with extremes of imagination

One of the goals of Eye's Mind was to establish contact with people who experience the relatively unexamined extremes of imagination, subsequently estimated at around 2–3% of the population at each end of the imagination spectrum. Through effective media [5.2] and social media use, the [project website](#), and outreach events [5.3], putting awareness of these cognitive styles into the wider public domain stimulated an overwhelming response: over 14,000 people with either aphantasia or hyperphantasia contacted the project team by email, unprompted [5.4]. Analysis of a random sample of 437 indicated that only c.2% expressed prior awareness of the phenomenon of aphantasia, while 60% explicitly stated they previously had none. 35% said that the research had some kind of emotional effect on them.

Responses sampled included expressions of shock, relief, or gratitude that the distinctive nature of their experience has been recognised and named, is shared, and was the target of scholarly attention. One respondent stated: '*This is unbelievable. I've gone my entire life attempting to explain that I cannot picture things in my head.*' Some aphantasics had struggled to conceive the difference between their own and others' powers of visual perception, for example thinking that others were simply using overly florid metaphors to describe seeing things in their 'mind's eye'. One email respondent said: '*at times I've felt like maybe I was just normal and everyone else was dramatically overselling what they were able to do with their minds. It's been confusing.*' Other respondents reported a prior awareness that something was different about themselves, but they had been unsure what it was, or had struggled to explain it. Having heard about the research, they could now understand how they differed from other people; and point to the research, both to verify and explain this difference to others [5.5].

##### 4.2 Building a community of those with extremes of imagination

Not only did the research enhance the understanding of their minds for these 14,000+ people, but they in return contributed valuable knowledge to the project through completing subsequent questionnaires about their experience of imagery and visualisation [5.6]. Many expressed a strong desire for more knowledge from the ongoing research, and that learning that others shared these particular and unusual characteristics has enabled them to build a community of interest based on that shared experience.

In addition to publicising the existence of these experiences as specific and shared conditions, the very fact that the research team had named these phenomena 'aphantasia' and 'hyperphantasia' inspired the creation of forums and support groups among those who had heard about the research. These include the [Aphantasia Awareness](#) group on Facebook (15,700 members), which notes on its front page that the term was coined by the Eye's Mind project. Another forum, no longer current, formed between September 2015 and July 2019 had 7,000 users posting over 5,700 messages on 809 subjects [5.7]. A Reddit community [/r/Aphantasia](#) has 26,500 members with over 20,000 posts since it began in 2015.

### 4.3 Further learning and community-building

A subsequent extension to the project builds on the surprising finding from the survey [5.6] that a significant proportion, particularly of aphantasics, were creative in their profession or everyday lives, many of them visual artists. This led to a touring art exhibition at the Tramway, Glasgow, January-March 2019, and Royal Albert Memorial Museum (RAMM), Exeter, March-June 2019, celebrating creative work by aphantasic and hyperphantasic artists and exploring how differences in imagination affect creative practice. The exhibition showcased scientific and philosophical insights into how the brain enables imagery, and its relationship with imagination, memory, perception and creativity, including an exhibit by Macpherson on forms of perceptual experience that resemble visual imagination aimed at helping aphantasic people to understand it (Figure 1).

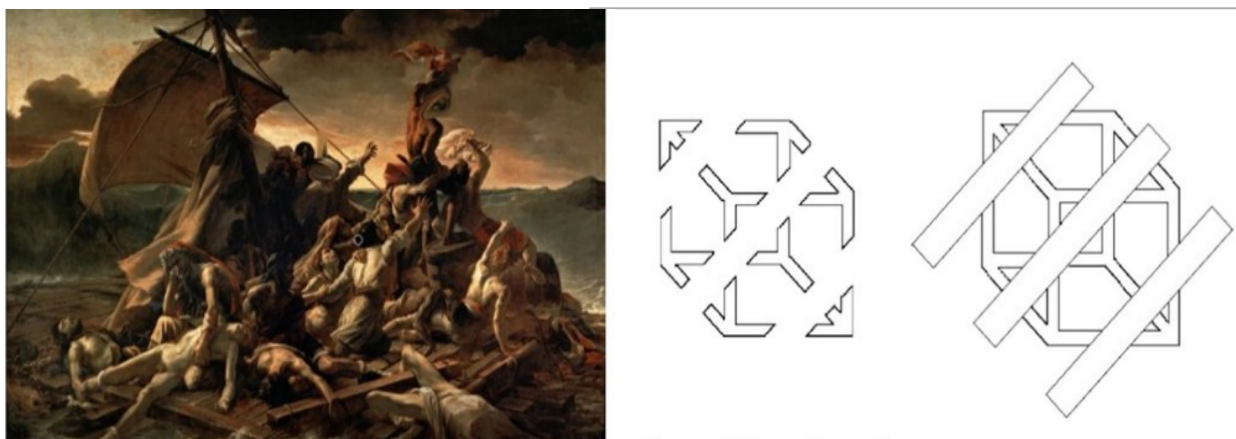


Figure 1 (left) example of artistic exhibit by Andrew Bracey *Aphantasia – raft of the Medusa* and (right) example of an optical illusion to explain the concept of visual imagery

The Tramway exhibition attracted 3,186 visitors and the RAMM exhibition attracted 17,437 [5.3]. The Tramway's curator commented '*you got our regular audience to engage in a different way and have a different experience, and think differently*' and a visitor survey indicated that 89% agreed or strongly agreed that '*this exhibition gave me a better understanding of Aphantasia and Hyperphantasia*'. 284 visitors gave unprompted feedback via comment cards, including 39% learning about aphantasia/hyperphantasia for the first time. The touring art exhibition was preserved in 2020 by UofG as an [online exhibition](#). It gathered 4,364 views by the end of 2020 [5.8]. One visitor commented on Macpherson's illusions exhibit: '*I think that I am aphantasic and the exercises after helped me to understand a little of what 'minds eye' means. Before I had no idea...*' [5.9].

Because of popular demand expressed by the community, including at an initial academic conference in 2017, a second conference aimed directly at those with extremes of imagination was organised by the project team in April 2019. This supported and deepened knowledge exchange and community building. 122 members of the public attended the conference [5.3] from all over the world (including North America and Japan), alongside 21 researchers, artists exhibiting at the exhibition, prominent aphantasics (such as ex-chief of Pixar Ed Catmull), and a team of student volunteers and supporters from UofE Medical School. 63 people responded to a survey asking them about the impact of the conference, with 76% reporting an increased sense of understanding of themselves and others. 78% also reported an increased sense of community and 63% reduced isolation as key impacts. One survey participant commented: '*it opened up my*

*world. Everything began to make sense. I could finally understand why I struggled with certain things and it gave me the confidence to explore how I actually interacted with the world' [5.3].*

## 5. Sources to corroborate the impact

- 5.1 PI of Eye's Mind project, corroborating and commenting on the contribution of Macpherson's research to the project [PDF]
- 5.2 Examples of media coverage, the means by which the team reached tens of thousands of people with extremes of imagination [collated PDF]:
- <https://www.scientificamerican.com/article/when-the-minds-eye-is-blind1/>
  - <https://www.sciencefocus.com/the-human-body/aphantasia-life-with-no-minds-eye/>
  - [https://broadly.vice.com/en\\_us/article/59mz7k/aphasia-neurological-condition-unable-imagine-things](https://broadly.vice.com/en_us/article/59mz7k/aphasia-neurological-condition-unable-imagine-things)
  - <https://www.bbc.co.uk/news/health-34039054>
  - <https://eu.usatoday.com/story/news/2015/08/27/some-people-born-without-minds-eye-adam-zeman-cortex/32472329/>
  - <https://www.nytimes.com/2015/06/23/science/aphantasia-minds-eye-blind.html>
- See also: <https://www.bbc.co.uk/programmes/w172wq4ls9dvt2p>
- 5.3 *Aphantasia: Evaluation of Outreach Activities*. Report for UofG summarising and analysing evaluation data exhibition events as well as emails sent to the Eye's Mind team, showing effective engagement with and between communities of aphantasics and hyperphantasics [PDF]
- 5.4 Document nominating the Eye's Mind project for a neuroscience prize, detailing the email response and giving the figure of over 14,000 [PDF]
- 5.5 Report analysing a sample of 437 of the 14,000+ unprompted emails received up to July 2019, detailing and quantifying the emotional reaction and comments on whether individuals had prior knowledge. [Excel saved to PDF]
- 5.6 Questionnaire survey data of aphantasics who contacted the project. These people who had emailed the project following the media outreach naming the phenomena of aphantasia and hyperphantasia were then contacted to participate in the research via a survey. [PDF]
- 5.7 Evidence of Aphantasia forums, corroborating community-building [collated PDF] including:
- Screenshot of Facebook group front page showing member numbers, and referencing the Eye's Mind project in the blurb
  - Screenshot of the Reddit group front page showing member numbers
  - PDF print of aphantasia website overview saved on 1<sup>st</sup> July 2019. As of November 2019, the domain name had not been renewed, rendering the website inaccessible.
- 5.8 Web statistics showing engagement with the online exhibition April-December 2020 [PDF]
- 5.9 Report of survey of visitors to the online exhibition (before and after) [PDF], including many qualitative statements corroborating the impact of the exhibition principally in terms of increasing understanding of what visual imagination is for aphantasics, and how aphantasics can be visual artists for others.