

# Mental Imagery: Greasing the Mind's Gears

Dan Cavedon-Taylor

*The Open University*

© 2023 Dan Cavedon-Taylor

*This work is licensed under a Creative Commons  
Attribution-NonCommercial-NoDerivatives 3.0 License.  
<[www.philosophersimprint.org/023023/](http://www.philosophersimprint.org/023023/)>*

## 1. Introduction

Mental imagery is the kind of psychological state you are in when you picture or envisage an object, event or situation. This paper introduces and motivates a novel conception of mental imagery; namely, that it is grease for the mind's gears. By "gears" I mean various psychological faculties: perception, belief and judgment, desire, intention, memory, etc. By saying that mental imagery "greases" these, I mean that it has the higher-order functional role of aiding the aforementioned faculties ("gears") in discharging their functional roles. So this conception of mental imagery has two glosses. First, there is the imagery/grease analogy, then there is the more literal Mental Grease Thesis, or MGT for short.

### **Mental Grease Thesis (MGT):**

Mental imagery aids psychological faculties in discharging their functional roles.

MGT is a naturalized thesis about mental imagery, one that draws inspiration from a wide array of research in clinical, experimental and social psychology. MGT is neither a definition of mental imagery, nor a piece of folk wisdom. The thesis does attempt to capture a truth about mental imagery, but one that is pitched at a high level of abstraction. For instance, MGT makes no mention of, and so is compatible with different views about, mental imagery's content, format, phenomenal character and relation to the will. These topics have traditionally dominated philosophical discussions about imagery. However, overly narrow attention to them has obscured two important facts about imagery, ones that take central focus in the psychological literature and which MGT is intended to shed light on. The first of these is imagery's architectural promiscuity.

### **Architectural Promiscuity:**

Mental imagery is architecturally promiscuous insofar as it interacts with a variety of psychological faculties, including, for example, perception, belief and desire, among others.

For instance, in conditions of poor visibility, projecting mental imagery into the scene that one faces can help perception better “light the way” in terms of guiding action. Or, when working out the answer to a crossword clue, imagery may help one form beliefs about the right answer. Imagery can also bolster desire’s motivational force, keeping one on the straight-and-narrow when faced with competing impulses. These claims, which I unpack below, are backed by evidence from clinical, experimental and social psychology (Sects. 2 and 3).

The second feature of mental imagery that I discuss here is its psychopathological relevance.

**Psychopathological Relevance:**

Mental imagery is psychopathologically relevant insofar as abnormalities of mental imagery actively contribute to a range of psychological disorders.

For instance, variously “problematic” patterns of imagery are causally relevant for the onset, maintenance and even partial constitution, of psychological conditions as diverse as post-traumatic stress disorder, bipolar disorder and depression (Sects. 4 and 5).

Architectural promiscuity and psychopathological relevance deserve consideration in their own right, as two significant but under-theorized features of mental imagery. Once we do acknowledge them, two puzzles come into view. First, imagery’s architectural promiscuity raises the following question: How should we think about a state of mind that interacts with so many distinct psychological faculties and their associated processes, and seems to perform very different functions when doing so? Is there a way of thinking about imagery that might unify these heterogeneous interactions? Second, imagery’s psychopathological relevance illustrates how harmful imagery can be to the human mind. This is in direct contrast with its architectural promiscuity. How should we characterize a psychological state that plays these opposing roles in human psychology, helping and hindering to such extreme degrees? MGT provides a solution to both puzzles,

providing a unified account of imagery’s multifarious interactions with different psychological faculties and its apparently contradictory contributions to human cognition (confirming that the level of abstraction at which MGT characterizes mental imagery is not so elevated as to be vacuous).

Some qualifications: first, this is a paper about mental imagery and not the imagination. For those who equate the two, this paper might be read as one concerning the imagination. But some caution may be called for in making this equivalence (Gregory 2016; Arcangeli 2020). A second, and very much related, point is that, although the imagination is sometimes said to be functionally heterogeneous (Kind 2013; Kind and Kung 2016; Langland-Hassan 2020), that is not the driving concern here: my primary focus is restricted to architectural promiscuity, along with the question of how to square that feature of mental imagery with its psychopathological relevance. Third, since MGT is not a definition of imagery, everything I say is compatible with other mental states and processes being characterized in an identical way. This does not rob MGT of theoretical interest, however, insofar as MGT highlights harmony among imagery’s operations where we might otherwise have a discordant muddle.<sup>1</sup> Fourth, although other accounts of architectural promiscuity and its relation to psychopathological relevance are possible, a cost–benefit comparison with potential rivals is left for another time. Having said that, one reason for interest in MGT is that it represents an alternative to the currently dominant philosophical conception of mental imagery—that is, as a perceptual (or quasi-perceptual) state of mind. I shall have some things to say about that matter in closing.

1. One way of thinking about the status of MGT is that it is what Nick Wiltsher (2019, 3) calls a *framework*—“a broad, general way of thinking about a subject that puts thoughts about it into plausible and coherent order, clarifies and illuminates those thoughts, and suggests ways in which its key ideas could be developed or applied.” As Wiltsher goes on to say, “A framework can often be summarized in a slogan that broadly characterizes a group of phenomenon and explanations of them.”

## 2. Architectural Promiscuity I: Imagery-Assisted Perception

Mental imagery can be instantiated in a variety of ways. Sometimes mental imagery is tokened intentionally, via a deliberate act of will. On other occasions imagery is tokened intrusively, against one's will. My focus here will be on the following distinction: imagery tokened in the mind's eye versus imagery tokened in perceptual experience, or what I shall call "imagery-assisted perception." Compare visualizing a bouquet of flowers "in one's head," and so in no space in particular, versus visualizing that same bouquet to be located in the empty vase currently before you. The latter is what I have in mind with the term "imagery-assisted perception."<sup>2</sup>

Imagery-assisted perception has been put to several explanatory uses. Neil Van Leeuwen (2011, 57) claims that it shows how imagination is "central to producing action" and not decoupled from one's motor system. Alan Thomas (2009), Bence Nanay (2010) and Amy Kind (2018) all claim that imagery-assisted perception explains amodal perception, i.e. how one represents the occluded parts of environmental objects and thus experiences objects as 3-D, despite being unable to see all of their sides simultaneously. Gregory Currie and Ian Ravenscroft (2002, 29) claim that what they effectively term the "invasion" of perception by imagery in these situations explains the visual character of the imaginings one undergoes when watching a film: one sees the screen image and in it the actors and sets recorded, and then uses imagery to imagine these to be fictional characters and locations.<sup>3</sup>

2. Other terms for this phenomenon include "superimposed mental imagery," "imaginatively augmented perception" and "make-perceive" (Briscoe 2018). It has also been called "imagination infused perception" (Brown 2018). As some of these labels suggest, philosophers have typically taken the phenomenon to support claims about imagination. In doing so they have thereby presupposed that mental imagery is, or entails, states of the imagination. I make no such assumptions here.
3. Currie and Ravenscroft (2002) are ultimately undecided on whether to characterize filmic experience as "perception-penetrated-by-imagination," which I take to be synonymous with "imagery-assisted perception" or "a non-perceptual form of imagining that is, nonetheless, strongly connected to perception" (30).

These claims are not mandatory. Other analyses of amodal perception — and of the role of imagery in action-guidance and filmic experience — are available. What is mandatory is recognizing the existence of imagery-assisted perception. This is not just a matter of naive introspection or thought experimentation. Imagery-assisted perception is either presupposed or strongly evidenced by a number of reputable paradigms in experimental psychology.

- In C. W. Perky's (1910) experiments, and Segal's later variants (1971; 1972), subjects confused seen figures, faintly back-projected on a dimly lit screen, with imagery that they were directed to mentally project onto the screen.
- Subjects directed to project imagery of stripes onto a colored background experienced visual aftereffects of color when, a short time later, they were presented with achromatic stripes at an identical orientation to those projected (Finke and Schmidt 1977).
- Studies measuring the acuity and resolution of imagery rely on subjects mentally projecting imagery of two dots onto a blank background before mentally 'moving' them (Finke and Kosslyn 1980).
- In temporal integration studies, subjects directed to mentally project a previously seen figure onto a screen, and combine it with an occurrent stimulus, were able to experience a fused composite of imagery and occurrent stimulus (Brockmole et al. 2002).

From the perspective of experimental psychology, imagery-assisted perception is a highly tractable phenomenon: "real, reliable, and replicable" (Segal 1972, 226).

In the philosophical literature there exist some mistaken notions about imagery-assisted perception. Discussing these is useful for fully characterizing the phenomenon and its relation to MGT. For instance,

Van Leeuwen (2011, 56 and 66), for all he says that is illuminating about imagery-assisted perception, wrongly characterizes the phenomenon as necessarily involving a nonveridical representation (the projected image) combining with a veridical one (the perceptual experience). Granted, imagery's utility in some cases of imagery-assisted perception is that it represents an absent object. Then, the image tokened will indeed be nonveridical. Van Leeuwen gives an example along the following lines:

#### **Skunk Skirting**

You are jogging along a road when you suddenly see a skunk. In order to work out where to move to avoid being sprayed, you must make an educated guess as to the spray's potential distance and direction. But you must do so in a way that can directly guide your actions. Solution: you use mental imagery to project, out into the scene before you, an arc that strikes you as the length and angle that the skunk's spray is likely to be, should the animal become riled.

Here, the projected image is nonveridical insofar as it represents something (the skunk's spray) that is absent from the scene before your eyes. Still, one should be careful not to think that this is how imagery-assisted perception works in general. Crucially, an image might be projected into visual experience in an attempt to match objects and properties present before one, but which one cannot see very well, or perhaps at all. When this mental action is performed successfully, the image will be veridical. This is certainly how those who claim that imagery-assisted perception explains amodal perception are thinking about matters. For instance, contrast Skunk Skirting with the following:

#### **Cat Completing**

You are looking at your cat, partially occluded by picket fencing. Some parts of the cat directly stimulate your retinae. Other parts, i.e. those behind the pickets, do not. Still,

### *Mental Imagery: Greasing the Mind's Gears*

there looks to be a whole, complete cat before you. Question: why is that what you experience instead of discrete, detached cat-parts? Answer: you undergo projected mental imagery of the parts of the cat present in the scene before you, but which happen to be occluded by the pickets.

In saying that imagery-assisted perception involves non-veridical imagery, Van Leeuwen's characterization of the phenomenon begs the question against using the phenomenon to explain amodal perception in this way.

Whether amodal perception is a matter of projected mental imagery is controversial (Briscoe 2011). But we needn't take a stand on that to construct counterexamples to Van Leeuwen's characterization of imagery-assisted perception. Consider a different vignette:

#### **Precarious Passing**

You are driving at night and visibility is drastically reduced. Suddenly, a car appears on the road before you. At least, you assume it to be one; all you can make out are two headlights. In order to work out whether there is space for your car to pass on the narrow lane, you must make an educated guess as to the size of the other car, given the position of its headlights. But you need to do so in such a way that can directly guide your action. Solution: you use mental imagery to project, out into the pitch black and surrounding the headlights, the outline shape of a car that strikes you as the correct size and shape.

Here, projected mental imagery combines with your visual experience to help guide action where the latter would be insufficient. In this, Precarious Passing is like Skunk Skirting. But familiarity with meeting cars along this difficult stretch of road may enable you to project a veridical image of the outline shape of the car, given the positioning of the seen headlights. There is thus no reason why the image in imagery-assisted perception must be nonveridical, as claimed by Van Leeuwen.

Crucially, whether the image that is involved in episodes of imagery-assisted perception is veridical, as in **Precarious Passing**, or non-veridical, as in **Skunk Skirting**, MGT sheds light on these situations. The mental image is integrated into visual experience in order to aid perception in discharging a central, if not defining, function: the guidance of particular actions within, and navigation through, one's immediate environment (Watzl 2014; Wu 2014; Schellenberg 2018).

Let us consider one way that this function can be bolstered by imagery. As Denis Buehler (2019, 2122–3) has made vivid, agents may, via switches in perceptual attention, usefully alter their degree of control over their actions. For instance, a pianist may switch perceptual attention from her left hand to her right hand at various points in a performance in order to more fully, and reliably, control her actions with each hand. In both **Precarious Passing** and **Skunk Skirting**, a similar effect is achieved via the use of imagery. In these situations, projecting mental imagery to particular locations in the visual field assists you in exercising a greater degree of control over your actions with respect to those locations and the objects situated there. After all, you might plausibly skirt the skunk and pass the car without relying on imagery. Whether you could do so reliably, however, particularly in **Precarious Passing**, is somewhat doubtful. Mental imagery helps you here to not merely skirt the skunk and pass the car *tout court*, but skirt the skunk *more effectively*/pass the car *less precariously* than you might otherwise. By focusing your attention on relevant spatial locations, the imagery you project into these scenes allows for more reliable control over your actions with respect to objects in those scenes.

Again, alternative analyses of imagery's role in action-guidance are possible. But a second account of the functional role of imagery in imagery-assisted perception is available to the defender of MGT: that such cases show how imagery can assist perception in the representation of sensory properties.<sup>4</sup> In **Skunk Skirting**, the sensory property

4. By “sensory properties” I mean so-called low-level perceptual properties: in the case of vision, color, shape and various spatial properties in the case of vision; in the case of audition, timbre, pitch and loudness; and so on.

represented (the spatial arc of a spray) is a non-instantiated property that may, fairly disastrously, be instantiated in the near future. Thus, you use mental imagery here not only to guide occurrent action, but to prepare for possible, future action. In **Precarious Passing**, by contrast, the property represented (the outline shape of a car) is, in fact, instantiated. However, viewing conditions preclude it from featuring in your perceptual content in a bottom-up manner. Crucially, if an agent is to use their visual experience to guide their action in this case, then they need to fill in the details of its content for themselves. This is what infusing perceptual experience with imagery does.<sup>5</sup> The mental action of imbuing perceptual experience with imagery allows perception to better guide one's actions insofar as it enables one to represent, within one's visual experience, the car's suspected outline shape. Cases of imagery-assisted perception are thus right at home within the framework of MGT, showing how imagery can assist perception twice over: in guiding action and in facilitating the representation of sensory properties.<sup>6</sup>

### 3. Architectural Promiscuity II: Imagery-Assisted Cognition

Several discussions of what I am calling “imagery-assisted perception” can be found in the philosophical literature.<sup>7</sup> By contrast, and a few examples aside, sustained discussions of imagery-assisted cognition are more difficult to find.<sup>8</sup> In general, the idea that imagery can inter-

5. **Precarious Passing** is perhaps naturally interpreted as a situation in which one tokens the mental image in perception intentionally. If so, that is a contingent feature. Sufficient familiarity with situations of this kind may cause one to token the image automatically and non-voluntarily.
6. Although it might be tempting to fold these two functions into one, I am inclined to keep them apart, if only because they may be empirically dissociable. For instance, there may be switches in attention that help with action-guidance but not by altering perceptual content *per se*.
7. In addition to Van Leeuwen 2011, see Grush 2004, Briscoe 2008, Nanay 2010, Pettersson 2011, Brown 2018 and Kind 2018.
8. But see Gauker 2011, ch.5; Langland-Hassan 2015; Sinhababu 2017, ch.2; and Arcangeli 2020. Phenomena like mental rotation (which enables judgments of identity/non-identity) or using imagery to tell if a piano will fit through a

act with thought has, in contemporary philosophy of mind at least, received much less attention than the idea that imagery can interact with perception. At least two explanations for this seem likely. First, one might worry that admitting imagery into thought entails regressing to an early-modern empiricism on which cognition is fundamentally composed of images (but see Prinz 2002). Second, we face a “format” problem of having to explain how iconically/pictorially structured mental states can combine with ones that are propositionally/sententially structured. This latter worry does not arise when dealing with imagery-assisted perception. For there, a common iconic/pictorial format, one shared by perception and imagery, may be assumed.<sup>9</sup>

I won't address either of these issues here. My aim is to make a case for the reality of imagery-assisted cognition, examine some of its details and show how it supports MGT. I leave for another occasion the task of attempting to resolve puzzles that arise from doing so.

### 3.1 *Belief*

M. G. F. Martin (2002, 403) gives two examples of imagery-assisted cognition (I provide the labels):

#### **Clue Cracking**

While attempting to fill out the crossword, images of potential answers to clues pass through your mind.

#### **Move Making**

While playing chess, you work out which move to make next by visualizing, in your mind's eye, potential configurations of the chess board.

---

door (which enables a judgment of nomic possibility) might be considered examples of imagery-assisted cognition. Alternatively, they may be considered cases of ordinary belief, caused by imagery-assisted perception. I leave the task of classifying these particular cases for another occasion.

9. This is compatible with such states also having propositional elements (see Quilty-Dunn 2020).

Martin seems to offer the examples in order to illustrate the following distinction: imagery as “accompany[ing] and also constitut[ing] trains of thought.” Martin says little more. The distinction warrants careful attention, however, since there are at least two further sub-distinctions to be drawn, both relevant for MGT.

First, in *accompanying* a train of thought, imagery might be:

- (i) epiphenomenal “steam,” i.e. produced by the machinations of cognition, yet not occupying any further functional role itself; or
- (ii) performing some function, i.e. shaping the nature of that train of thought by causally determining its successive parts.

Second, in *constituting* a train of thought, imagery might:

- (iii) only partially constitute a train of thought, working alongside propositionally structured contents and attitudes; or
- (iv) the presence of mental images might be said to constitute a train of thought all by itself.

MGT doesn't say that thinking can occur with or alongside imagery, but that imagery *aids* thinking. So not all of (i)–(iv) are compatible with MGT. Options (ii) and (iv) are, while (i), the epiphenomenal “steam” view, is not. Matters are somewhat unclear in the case of (iii). If imagery is a proper part of a cognitive process, that need not entail that it plays a causal role in determining successive parts of the process. Whatever one says about that particular matter, (i) clearly defines a skeptical position that is deeply antithetical to MGT. That is where I shall focus my efforts.

Here's how the skeptical view might be developed. Take **Clue Cracking**: having images of potential crossword answers pass through your mind might be a result of representing those potential answers in fully propositional thought, e.g., via a non-committal propositional

attitude like entertaining (see Kriegel 2013). That is, the images may occur, yet make no contribution to your working out the answers to the crossword clues.

Now **Move Making**: while it might seem to you that visualizing configurations of the chess board helped you to work out which move to make next, the skeptic may retort that introspection cannot be trusted to settle this matter. Their point need not be that introspection is generally unreliable, just that introspection is not so keen as to detect in cases like **Clue Cracking** and **Move Making** either: (a) a relation of partial constitution, with the imagery introspected as both a proper part of the cognitive process and also functionally operative, rather than epiphenomenal; or else detect (b) the absence of relevant propositional attitudes, something that seems required for introspection to support the inference that imagery sometimes constitutes a chain of thought all by itself. The latter option, (b), might be thought implausible anyway. After all, in cases like **Clue Cracking** and **Move Making**, various relevant contents about the chess pieces and board are likely to be instantiated in belief and other propositional attitudes.

How should a defender of MGT reply? I think that they should admit the existence of situations in which beliefs are formed, contents entertained, etc. and where any imagery instantiated as a result is epiphenomenal. Nevertheless, they should refuse to recant the claim that imagery does, on some occasions, genuinely aid thought. That this is what imagery genuinely achieves is best appreciated by reflecting on subjects who lose their capacity for mental imagery.

"Aphantasia" is a term coined recently to describe an inability to generate mental imagery (Zeman et al. 2010; Zeman et al. 2015; Zeman 2020; see also Cavedon-Taylor 2022; Arcangeli 2023; Blomkvist 2023). The condition occurs congenitally, but can also be acquired following brain damage.<sup>10</sup> Here, we'll focus on acquired cases. Strikingly,

10. The evidence for aphantasia has become particularly robust in recent years, because one need not rely on questionnaires to test for its presence, but can use certain psychophysical measures too: aphantasics are not susceptible to the priming effect that imagery has for ordinary subjects in conditions of binocular rivalry (Keogh and Pearson 2018) and, unlike non-aphantasics,

patients suffering from "pure" acquired aphantasia, i.e. with no other impairments, exhibit deficits to cognition. This is evidence that imagery is not always a merely epiphenomenal "steam" that results from cognitive processes, but is sometimes causally relevant for cognitive processes themselves.

Let us consider two cases of acquired aphantasia from the clinical literature that support the above claim. One patient with aphantasia reported to clinicians on their difficulty ordering food, stating "When they ask me if I want some crisps or peanuts, I'm unable to answer because I can't mentally distinguish their different shapes" (Moro et al. 2008, 110). Here, the patient, through losing mental imagery, has suffered a deficit to practical reasoning. Through being unable to generate mental imagery, i.e. of the relevant snacks, the patient was unable to reflect fully on the choices available to them and reach a decision as to what snack to choose.

Now consider a second patient, R.M., reported by Farah et al. (1988, 152–53). Through losing mental imagery, R.M. was unable to reliably judge the truth-value of so-called Eddy and Glass sentences (Eddy and Glass 1981). These are sentences that, in the absence of the objects referred to, are thought to require visual imagery for their verification, e.g. "A grapefruit is larger than an orange." These sentences contrast with so-called "low-imagery" sentences that, in the absence of the objects referred to, are not thought to require imagery for their verification, e.g., "Animals are stuffed by a taxidermist." R.M. made numerous errors when asked to verify the Eddy and Glass sentences, yet performed "nearly perfectly" (153) when verifying the low imagery sentences. In a separate test, clinicians observed that R.M. often had to guess when answering questions about the appearances of objects more generally, whereas R.M. would answer confidently (and correctly) when stating commonplace facts:

---

experience no arousal of the autonomic system when reading emotionally-charged texts (Wicken et al. 2021, 149).

A pineapple: Again he declined to describe the item. When asked where they are grown he responded “Hawaii.” When asked if the leaves were rounded or pointy he guessed “rounded,” and when asked if they had a long stem guessed “yes.”

For R.M., their loss of imagery reduced their reliability at judging the truth-values of certain propositions; namely, those concerning the looks or appearances of objects.

These cases ought to put the skeptic on the back foot. The fact that aphantasics freeze in the face of everyday questions, or are reduced to guesswork, suggests that imagery was previously helping them to formulate beliefs. With imagery’s absence, judgments are harder to come by for these patients. As Farah et al. (1988, 152) put it, the impoverished performance of R.M. in the above tasks “does not have any obvious alternative explanation in terms of impaired processes other than imagery.” Crucially, this is entirely what is predicted by MGT: without imagery, not only can certain beliefs be more difficult to form, but belief may less reliably aim at truth (as in the case of R.M.) and may fail to represent objects in ways that might guide decision making (as with the patient who was indecisive about which snack to order). Insofar as aiming at truth and guiding decisions are two of belief’s hallmark functions, mental imagery is not always epiphenomenal “steam” caused by, but not causally affecting, cognition. Thus, imagery can be a key ingredient in processes of belief-formation, functioning as grease for cognition no less than perception.<sup>11</sup>

11. An anonymous referee suggests that imagery loss and its associated cognitive deficits in acquired aphantasia may have a common underlying cause, rather than the former being responsible for the latter. The falsity of this ‘common cause’ hypothesis is often taken for granted in the literature, as the above quote from Farah et al. (1988) indicates. Having said that, Farah et al. believe that accounting for R.M.’s results in terms of an imagery deficit is the “most parsimonious” (156) explanation. Moreover, Farah et al. took care to perform further tests to confirm that R.M.’s poor performance on imagery-based tests was not as a result of a disconnection between imagery and language (ibid.) and this may be understood to be a version of the “common cause hypothesis.”

Now, there is evidence that subjects with congenital aphantasia perform similarly to non-aphantasics on certain imagery tasks (Pounder et al. 2022). However, it is important to recognize that MGT makes no predictions about interpersonal differences between individuals whose faculties exploit imagery and individuals, like congenital aphantasics, whose minds may rely exclusively on non-imagery processes. Indeed, as Adam Zeman (2010, 146) and his collaborators point out, in a well-known study of the aphantasic individual MX, “there may be multiple routes to success” in cognitive tasks.

At most MGT makes an intrapersonal prediction: that those whose faculties have historically used imagery *may* function worse if their imagery goes missing. And this is precisely what is suggested by reflection on the two clinical cases of acquired aphantasia discussed above. But note the emphasis here on “may”. For there are some individuals with acquired aphantasia, like MX, who perform as equally well as non-aphantasic controls on certain imagery tasks. Isn’t that problematic for MGT? It might seem so, but the devil is in the details. For MX’s fMRI results indicated that an atypical network of brain regions was active when performing the tasks. As Zeman and his colleagues observed, this is evidence that MX used non-image-based strategies to complete the imagery tasks. And it is entirely compatible with MGT that non-image-based states and processes may pick up the slack when imagery is absent.

### 3.2 *Desire*

My discussion of imagery-assisted cognition has focused so far on how imagery interacts with belief and judgment. But similar remarks hold for desire. Consider desire-based analogues of **Clue Cracking** and **Move Making**:

#### **Yuletide Yearning**

While thinking about what she wants for Christmas, images of potential presents pass through Sara’s mind.



**Desirable Décor**

Decorating his new flat, and finding himself unable to decide which of two colors to paint the lounge, Anil works out which color he most desires by visualizing his furniture in a room painted one color and then the other.

It might be objected that **Yuletide Yearning** and **Desirable Décor** show only that imagery can help us gain knowledge of our desires, not that imagery interacts with desires in any interesting way. Of course, a friend of MGT might grant the objection, since it is hardly against the spirit of MGT to be told that imagery aids self-knowledge. Alternatively, a friend of MGT might reply that **Yuletide Yearning** and **Desirable Décor** are contexts in which imagery helps one to form certain desires, e.g., for such-and-such a toy or such-and-such a color on one's walls, in the same way that imagery helps one form certain beliefs, e.g., about the answers to crossword clues, as in **Clue Cracking**, or the most effective chess-move to execute, as in **Move Making**.

A defender of MGT need not leave matters there. Extremely direct interactions between imagery and desire can be articulated. Consider the following situation:

**Impetus Improvement**

Finding that motivation to continue his latest exercise regime is flagging, Dale visualizes the benefits of a healthier lifestyle: not feeling so tired in the mornings, beating his rival at squash, etc. Picturing these situations, Dale puts down the chocolate bar he was about to eat, fixes a light lunch and messages a friend about going for a run.

What imagery does here is aid the motivational force of Dale's desire for a healthier lifestyle at a point in time when it was at risk of being extinguished by a conflicting desire for, say, junk food and another Sunday afternoon binge-watching television shows. Not only can imagery help one form desires and gain self-knowledge of one's desires, it can also bolster the motivational force of an already formed desire.

In **Impetus Improvement**, imagery helps to ensure the continued instantiation of one of Dale's desires in the face of a competing one. Here, imagery has helped to keep Dale's desire on the straight-and-narrow.

These examples are made up, but none of this is mere intuition-pumping. Studies in social psychology have consistently shown that picturing oneself engaging in various behaviors makes one more likely to enact those behaviors. The effect has been replicated in a range of domains:

**Political participation:** subjects instructed to produce imagery of themselves voting from a third-person perspective prior to an election were more likely to vote than were controls who were not so instructed. (Libby et al. 2007)

**Pro-social behavior:** subjects instructed to produce imagery of themselves helping a person in need, e.g., locked out of their house, were subsequently more inclined to help a person in need than controls who were not so instructed. (Gaesser and Schacter 2014)

**Consumer behavior:** subjects instructed to produce imagery of themselves using a cable television service were subsequently more likely to subscribe to such a service than controls who were not so instructed. (Gregory et al. 1982)

**Studying behavior:** subjects instructed to produce imagery of themselves studying for an upcoming test subsequently studied for longer, and performed better, than controls who were not so instructed. (Pham and Taylor 1999)

**Sporting behavior:** subjects learning to putt in golf and who were instructed to produce imagery of themselves performing a successful stroke subsequently spent more

time practicing their putting, and adhered better to their training program, than controls who were not so instructed. (Martin and Hall 1995)

Now, one question we can ask is how the mind must be structured for there to be situations that involve thinking with imagery as well as seeing with imagery. This is an empirical question. It asks how the mind might be organized such that a single psychological state, like imagery, can be enabled to directly interact with different psychological faculties and their associated processes. A related empirical issue we might wonder about is how imagery can be triggered to sometimes interact with perception (and not belief or desire) yet on other occasions caused to interact only with cognitive processes (and not perceptual ones).

As interesting as they are, those questions aren't my concern. I am interested in a conceptual question: How should we think about a psychological state that is able to find its way into distinct psychological faculties and processes, seeming to perform different functions when doing so? This question can be asked in abstraction from empirical issues surrounding how such promiscuity is effected. The puzzle here is to understand what is occurring *across* the various situations and vignettes described throughout this paper, never mind what happens in each individually. **Precarious Passing** is a perceptual situation in which imagery affords a higher degree of control over one's actions and augments perceptual content. **Move Making**, by contrast, is a situation in which the reliability of belief-formation is increased and decision-making promoted. **Impetus Improvement** is a context in which motivation is kept on track, and so is different yet again. Not only do the faculties interacted with differ, but so too, crucially, does the manner of interaction. Is there a common factor?

Yes, there is. What imagery is doing across these situations is not merely interacting with various faculties, but supporting each to "do their thing." Imagery is interacting with the faculties in a particular, twofold manner: *helping* each to discharge their *characteristic* functional

role. Or so says MGT. That is, MGT postulates a specific form of interaction between imagery and various psychological faculties. In doing so, it provides a unifying account of imagery's operations. If all MGT said was that the common denominator here is that mental imagery is interacting with different faculties, then that would fail to be informative — it would just restate the fact of architectural promiscuity. But that is not how MGT pictures matters. Compare, for instance, MGT with the claim that what unifies the above contexts is that all involve mental imagery and mental imagery is a way of presenting content to the mind and its component faculties. This characterization of mental imagery appears accurate, but it also appears pitched at too high a level of abstraction to be very informative. It seems to reiterate the fact of architectural promiscuity insofar as it fails to give a more precise characterization of the nature of the interaction between imagery and faculties.

Importantly, MGT claims that imagery's architectural promiscuity is not a disordered jumble of functions. Architectural promiscuity, that is, does not entail wholesale functional promiscuity. Instead, MGT identifies a degree of functional consistency: the situations outlined above are ones in which imagery assists a psychological faculty to discharge its characteristic functional role. MGT thus pinpoints a noteworthy commonality across the above situations. It supplies a cohesive account of what might otherwise be left as fragmented psychological phenomena.

None of this makes imagery necessary for perception, belief and desire. Again, that claim is obviously too strong. But what it does mean is that things risk going less well for these faculties when imagery, for whatever reason, goes awry or is not available. The results from experimental, social and clinical psychology outlined above, those involving aphantasia in particular, support that claim. Although we may be left wondering how a single psychological state could be enabled to interact with so many disparate faculties and processes, that is an empirical matter that MGT does not attempt to address.

#### 4. Psychopathological Relevance

The second neglected feature of mental imagery that MGT helps us to better understand is its psychopathological relevance. There is scant discussion of this feature of imagery in the philosophical literature. I'll first explain some relevant findings from clinical psychology before spelling out the relation between imagery's psychopathological relevance and MGT.

Recent work in clinical psychology has identified abnormalities of mental imagery across a range of psychological disorders. The following is a small sample:

**Post-traumatic stress disorder (PTSD)** is associated with imagery-based "flashbacks" to adverse life events (Pearson et al. 2013, 8).

**Social phobia** is associated with negatively-valenced third-person imagery, i.e. from the point of view of an interlocutor (Hirsch et al. 2003) and socially phobic individuals have been found to perform worse than controls on tests for generating imagery of neutral stimuli, such as letters of the alphabet (Morrison et al. 2011).

**Schizophrenia** is associated with a high score on tests for imagery vivacity (Oertel et al. 2009), yet individuals with schizophrenia typically perform worse than controls on tests that measure the abilities to inspect (Aleman et al. 2005) and maintain (Kang et al. 2011) imagery.

**Bipolar disorder** is associated with abnormally high results on several imagery measures, including tests for spontaneous use of mental imagery (McGill and Moulds 2014), e.g., when planning the order of chores, thinking of a friend, or listening to a story on the radio.

**Major depressive disorder (MDD)** is associated with several abnormalities of imagery, including an impaired

ability to intentionally generate mental imagery of the future (Williams et al. 1996).

In principle, abnormalities of mental imagery might be associated with a psychopathology in at least four ways:

**Partial constitution:** Imagery abnormalities may be partially constitutive of a psychological disorder.

**Causes:** Imagery abnormalities may be among the causes of a disorder, relevant either for its initial onset or continued maintenance.

**Effects:** Imagery abnormalities may be among a disorder's effects.

**Concomitants:** Imagery abnormalities may be mere accompanying concomitants of a psychological disorder.

Crucially, only on the first and second will imagery abnormalities be psychopathologically relevant for a condition, where this means that such abnormalities actively contribute to a condition's instantiation and associated episodes.

PTSD is perhaps the most obvious condition that falls into the first category. Although the disorder may involve physiological symptoms, part of what it is to have PTSD is to experience imagery-based "flashbacks," with these being one of the condition's constitutive "hallmark symptom[s]" (Pearson et al. 2013, 8). Are there any other conditions on the above list that might fall into the first or second category? Two potential cases, among the most well-known and well-studied psychiatric conditions, are Bipolar Disorder and MDD.

##### 4.1 Bipolar Disorder

Bipolar disorder is typically described as a mood disorder. Although individuals with the condition may experience prolonged periods of mood stability, they are at risk of vacillating between episodes of depression and elevated moods called "hypomania" and "mania." In the

latter states, bipolar individuals feel euphoric and disinhibited, often engaging in impulsive and risky behavior. Strikingly, a leading theory in the clinical literature, the “mood amplification model,” identifies a cluster of imagery abnormalities as the mechanism by which an initially positive mood spirals into hypomania and mania (Holmes et al. 2008; Ng et al. 2016; O'Donnell et al. 2018). These include the frequent occurrence of intrusive, future-directed mental imagery, often of a highly-vivid nature. As those who initially described the model put it:

Rather than being engaged in the present (which can be quite mundane), there can be a thrill associated with “pre-experiencing” the future via imagining goals, and immersion in such imagery can amplify mood and associated actions ... The catalytic effect of imagery mechanisms on emotion could contribute to both the extremes of mood intensity in bipolar disorder, as well as to rapid changes in mood. (Holmes et al. 2008, 1255)

The thought here is that bipolar individuals undergoing an escalation of positive mood are assailed by vivid imagery of the future that propels planning and action. This increases their positive mood further until it eventually spirals out of control. Evidence for the model is robust. The cluster of imagery abnormalities outlined above has recently been found to be associated with mania risk among non-bipolar individuals (Peckham et al. 2020). What is more, the idea that mental imagery contributes to hypomanic and manic states is consistent with self-reports by bipolar individuals. In describing the phenomenology of their elevated moods, bipolar individuals often make reference to imagery:

[A] female patient in our clinic with BPD-I described that, when hypomanic, she began to experience “wonderful mental images of me, brightly coloured, I'm great, glowing ever so slightly.” This led her further “to portray myself in the appealing way I see myself in my image” by

“dressing in vibrant colours and not having shoes on”... [A]nother patient in our clinic described having such exciting positive future images of design projects that could be so vivid that they woke him up and kept him awake at night, trying to capture the goals and designs they represented by filling notebooks with the envisaged high-profile projects. (Holmes et al. 2008, 1255)

Imagery is thus a salient part of bipolar disorder not only from the perspective of clinicians, but also from the perspective of those who live with the condition. All this has led some clinicians to claim that the relevant imagery abnormalities are a “defining feature” (Holmes et al. 2008, 1254) or “distinctive hallmark” (Ivins et al. 2014, 240) of bipolar disorder.

For present purposes, it doesn't matter whether the relevant imagery abnormalities are partially constitutive of bipolar disorder, in the way flashbacks are partially constitutive of PTSD, or are instead only causally relevant for the condition; that is, by contributing to the onset or maintenance of hypomanic and manic states. On either option, imagery abnormalities are crucial for shaping the nature of bipolar disorder and its episodes, making mental imagery psychopathologically relevant for the condition.

#### *4.2 Major Depressive Disorder*

Another psychopathology in which imagery abnormalities play a surprising, but crucial, role is MDD. According to current clinical thinking (DSM-5), someone has MDD if they present with either (i) low mood or (ii) diminished interest in, or pleasure derived from activities (“anhedonia”), in addition to having four or more of the following symptoms over a two-week period:

- (iii) weight loss or decrease/increase in appetite
- (iv) psychomotor agitation or retardation
- (v) fatigue

- (vi) feelings of worthlessness or excessive or inappropriate guilt
- (vii) diminished concentration
- (viii) thoughts of death/suicide

As flagged above, MDD sufferers perform worse than non-depressed controls on tasks measuring the ability to intentionally generate future-representing mental imagery (Williams et al. 1996). Moreover, the future-representing imagery that individuals undergoing an MDD episode are able to generate has been found to be significantly less vivid than that of non-depressed controls (Morina et al. 2011). This fits with the commonplace idea that depressed individuals struggle to envisage the future (and perhaps their own place in it).

A skeptic might reply that these abnormalities could be mere effects or concomitants of MDD, rather than more interestingly related to the condition, i.e. its partial constitution or onset and maintenance. However, when one also factors in that (i) around 96% of MDD sufferers report frequent, unpleasant and intrusive flashbacks (Newby and Molds 2011); and (ii) may, at their most hopeless, undergo intrusive, imagery-based “flash-forwards” to acts of suicide (Crane et al. 2012), then imagery abnormalities start to look like they have the potential to be both causal maintainers and onset triggers of MDD, if not partial constituents. After all, frequently experiencing intrusive, negative images, whether of the past or future, can be expected to contribute to low mood or lack of motivation in most individuals. Indeed, a recent clinical review, in taking stock of results like the above, proposes the following model of imagery’s relation to the maintenance of MDD:

A vicious circle may be initiated in which distressing life events and negative thinking styles may cause negative imagery and subsequent depressed mood, which, in turn can lead to more rumination and intrusions ... [I]f dysfunctional cognitions are an important maintaining factor in depression and mental images are one type

of cognition ... [then] negative imagery, a lack of positive images, and flash-forwards to suicide or self-harm may play a significant role. (Weßlau and Steil 2014, 277)

In short, trauma may cause negative imagery which contribute to depressive symptoms, e.g., low mood and lack of motivation. These symptoms, in turn, cause more negative imagery, exacerbating depressive symptoms further and leading to even more negative imagery. According to this model, the relevant imagery abnormalities are not simply an effect or concomitant of MDD, but are part of a cyclical process that actively contribute to its episodes.

As with bipolar disorder, individuals with MDD often describe their symptoms in ways that implicate the relevant imagery abnormalities. An inability to envisage the future, or at least an improved one, is a common theme:

It was inconceivable to me that I should ever recover. The idea that I might be well enough to work again was unimaginable and I cancelled commitments months ahead. (Wolpert 1999, 154)

Compare the following remarks by an individual describing the phenomenology of their depression via a questionnaire designed by philosopher Matthew Ratcliffe:

You can’t see far into the future so you can’t see aspirations or dreams. Everything I ever wanted to do with my life before seemed impossible now. I also would think that I would never get out, that I’d be depressed forever ... I thought I’d never escape from the depths of depression and never achieve anything with my life. (Ratcliffe 2014, 111)

As Ratcliffe aptly puts it, MDD fails to involve “a sense of its own contingency” (71). In the grip of an episode, sufferers feel that they will be stuck in its blackness forever. This does not appear to be explanatory

bedrock, however. It seems apt to be explained, in turn, by the relevant imagery abnormalities: a reduced ability to intentionally generate positive imagery of the future, coupled with frequent and involuntary imagery of the past and future that are of a distressing nature. Like PTSD and bipolar disorder, MDD is a psychopathology where imagery abnormalities contribute to its associated episodes.<sup>12</sup>

### 5. MGT and Psychopathological Relevance

Imagery's architectural promiscuity is pictured by MGT as testifying to imagery's being hugely beneficial to the human mind. But the fact that conditions as diverse as PTSD, bipolar disorder and MDD have their episodes determined (either causally or constitutively) by abnormalities of mental imagery seems to go directly against that. The fact that imagery makes such opposing contributions to the human mind is our second conceptual puzzle: how ought we to *think* about a mental state that can help and harm the mind to such extreme degrees? Whereas the first puzzle concerned the seemingly unsystematic nature of the interactions between imagery and psychological faculties, this time the puzzle is that there appears to be an outright inconsistency between the (dis)value of imagery to human cognition.

As at the beginning of this paper, I consider MGT to be both a literal thesis, i.e. about imagery's higher-order functional role, and an analogy. As an analogy, saying that mental imagery "greases" the mind's gears is to say that imagery is related to the well-functioning of one's psychology. In greasing the faculties, imagery can help them, and the

processes they give rise to, run as they should, i.e. to discharge their characteristic functional roles. That is how MGT pictures imagery's architectural promiscuity. So what can it say about imagery's psychopathological relevance? Crucially, imagery's presence in the mind does not guarantee smooth functioning. For one, there can be too much grease in the gears, as in bipolar disorder, making the mind overwrought and pushing positive moods to the extremes of mania and hypomania. Alternatively, the "grease" might be of the wrong kind, as in PTSD and MDD, where negative imagery disturbs the mind insofar as it biases one towards negative thinking styles, lowers one's mood and produces unhealthy behaviors.

Continuing the analogy: when some machines malfunction, the solution may be to intervene on the oil that greases its gears. Some machines work better once excess oil is removed or when the oil is changed or renewed. Likewise, imagery-based therapies and interventions are effective at treating a range of psychological disorders (see Hackmann et al. 2011 for an overview). One particularly effective intervention, imagery rescripting, makes vivid this metaphor of "changing the oil." Patients are instructed to bring negative imagery to mind as vividly as they can, as if the pictured event is occurring in the here and now. Then, they are instructed to change how the event unfolds, effectively "swapping out" negative images for positive ones. Tellingly, this technique is effective in treating a range of disorders, including PTSD and MDD where, as discussed above, intrusive negative imagery is operative (Arntz 2012). In the case of bipolar disorder, reducing the frequency of intrusive future-directed imagery, akin to removing "excess grease," is an effective treatment for the condition insofar as it reduces mood instability (Holmes et al. 2016). Imagery can be relevant for a psychopathology not only by determining its onset, maintenance or partial constitution, but also, significantly, its treatment. This is further evidence that imagery plays an active role in shaping these

12. The idea that depression is, like PTSD, partially constituted by imagery abnormalities is one that Ratcliffe occasionally flirts with. Although he primarily characterizes depression as a kind of "existential feeling," Ratcliffe comes close to instead characterizing it as an imagery disorder in the following: "[D]epression can be described as involving an inability to 'simulate' certain things. If a person lacks any sense of the possibility of significant change, she cannot, by implication, simulate anything significantly different. But this is to be understood in terms of a wider-ranging inability to imagine ... a possibility space that equally affects perception, memory, expectation, and thought more generally." (209)

psychopathologies: appropriately changing a patient's imagery may thereby improve a patient's condition.<sup>13</sup>

Less figuratively, let us turn to MGT itself: mental imagery is a tool that aids psychological faculties to discharge their functional roles. Although it is difficult to see how this thesis relates to imagery's being pathologic, imagery's psychopathological relevance is both consistent with and clarified by MGT.

Consider the intrusive, negative imagery that partially constitutes PTSD and contributes to the maintenance, if not partial constitution, of MDD. In the case of PTSD, this imagery is usually very vivid. It may feel to those with the condition as if the past, traumatic event is occurring in the here and now. Although deeply distressing, the mind's capturing of the event in such detail, along with its later imagery-based "replayings," serves a function. As psychologist Chris Brewin and their collaborators explain:

Flashbacks are an adaptive process in which stored information can be re-presented and processed in greater depth once the danger is past. PTSD ... reflects the failure of the represented information to be attended to. (2010, 221)

In effect, involuntary flashbacks are imagery's attempt to assist memory in encoding important, threat-related information, i.e. about the traumatic event undergone. This information may have been insufficiently attended to at the time that the traumatic event occurred but, qua traumatic, may be survival-relevant for the future. This way of thinking about the value of imagery in PTSD is consistent with the idea that experiences of trauma often involve, at the time they occur, a dissociative response in the agent, e.g., of time's passing more slowly/rapidly than normal, emotional desensitization, a narrowing of attention, etc. Imagery-based flashbacks can be thought of as assisting

13. This is consistent with pharmacological interventions also being an effective treatment of the relevant conditions. Indeed, insofar as these improve mood (or mood stability) problematic imagery should be less likely to arise.

memory to encode important information that these earlier dissociative responses may have caused one to overlook. This idea extends naturally from PTSD to MDD too. That is, flashbacks function to correct a deficit of information processing (Schacter et al. 2007). Insofar as the encoding, storage and retrieval of information about past events is the *raison d'être* of memory (Tulving 2002; Robins 2017), intrusive imagery of past events--whether in PTSD, MDD or other psychopathologies -- functions to assist a faculty of mind to discharge a suite of characteristic functions.

Is this a coherent way to understand the role of negative, unpleasant imagery in PTSD and MDD, as a help to the human mind? On the face of it, this appears deeply counterintuitive. The occurrence of intrusive imagery-based flashbacks in these conditions is highly distressing. So how can one speak here of something beneficial occurring in the mind?

At least two points can be made in reply. First, we should distinguish (i) unpleasant imagery being a hindrance *for the whole person*, functioning as an unwanted distraction from everyday existence and possibly making life unbearable; and (ii) unpleasant, intrusive imagery being of assistance to *a faculty of mind*, e.g., memory. Some event, state or process, *S*, might be good for *Y*, but nonetheless bad for the whole, *X*, of which *Y* is a part. Likewise, an event, state or process might be useful for memory, assisting its characteristic functions, while nonetheless be distressing for the person whose memory faculty it is. The objection that MGT, in saying that imagery assists mental faculties, yields a confused picture of imagery's psychopathological relevance rests on an equivocation between psychological faculties and whole persons.

Second, we should also distinguish: (i) a psychological faculty's discharging its function from (ii) it being pleasant/unpleasant for a person to have that psychological faculty discharge its function. MGT says nothing at all about whether people enjoy their psychological faculties being aided by mental imagery. Saying that imagery "assists faculties of mind" does not entail that this is something one will necessarily find pleasurable. If one wrongly assumes otherwise, then matters may

indeed start to look confused insofar as undergoing negative, intrusive imagery can be anything but enjoyable. However, MGT is silent on these hedonic matters. That is a feature of MGT, not a bug. For it is obvious that it can be unpleasant when a faculty of mind discharges a characteristic function. Not every action that vision helps one to perform will be pleasant and not every truth that belief aims at will be satisfying to discover.

What about bipolar disorder? How is imagery assisting the mind here? The self-descriptions above, in Sect. 4.1, suggest that when imagery transforms positive mood into mania it is thereby influencing the planning of actions, decision-making and setting of goals. This reflects the future-representing nature of the imagery that occurs in the disorder insofar as future-representing mental states are commonly associated with these functions (D'Argembeau et al. 2009).

But what precise faculty is being aided here? I suspect it may be fruitful to picture the futurity-related imagery characteristic of bipolar disorder to be aiding the forming, and maintenance, of intentions. For one, intentions are commonly thought to have a connection to commitment to action in ways that desires do not (Bratman 1987; Audi 1991; see also Broome 2001). By this I mean that intending to  $\Phi$  involves one's having made up one's mind to  $\Phi$ . A person who intends to  $\Phi$  is usually understood to have settled on a particular course of action, in ways that someone who merely desires to  $\Phi$  may not have (Malle and Knobe 2001). This has the potential to explain why bipolar individuals are strongly disposed, in manic and hypomanic states, to actualize the states of affairs represented by their imagery. Recall the patient who experienced imagery of themselves brightly colored. Upon undergoing this imagery, they were then disposed to portray themselves "in the appealing way I see myself in my image" where this involved dressing in vibrant colors. The idea that imagery in bipolar disorder functions to aid the forming of intentions may also explain why irritability commonly accompanies manic and hypomanic states (Altman et al. 1994). Strikingly, the intentions formed by bipolar individuals in elevated moods are often highly impractical, making them

difficult, if not impossible, to fully enact. Recall the patient who tried to record the various "design projects" represented by the imagery that kept them awake at night. The clinicians reporting on the case continue:

He also said that while initially useful, productive and creative, once mania had taken over the intrusive images stopped being "useful" designs and became impractical, incoherent and unfeasible. (Holmes et al. 2008, 1255)

The frustration of intentions is an intelligible cause of irritability. And in bipolar disorder, the hinderance of intentions may have many sources, from one's own inability to enact such intentions, to their discovered incoherence, or the dissuasion (or prevention) of others to enact them.<sup>14</sup>

Finally, despite all I've said here about the roles played by mental imagery in the onset, maintenance, constitution and treatment of various psychopathologies, there is certainly more going on in these disorders than imagery-based abnormalities alone. I am not proposing that our understanding of psychological disorders can be at all monotheistic. I only aim to highlight in this section and the last the neglected roles played by imagery in relation to these disorders and address the puzzle of how to understand these problematic roles against the background of the assistive ones discussed in the paper's opening sections.

In sum: nothing about the psychopathologies discussed here challenges MGT's assertion that mental imagery aids psychological faculties in discharging their functional roles. Indeed, if what I've said in this section is right, then quite the opposite is true. Assisting psychological faculties is precisely what mental imagery is doing in the psychopathological contexts discussed here.

14. Needless to say, the frustration of imagery-based intentions may be one among many causes of irritability in manic and hypomanic moods.



## 6. Conclusion

Psychologist Joel Pearson begins his entry in the *Cambridge Handbook of the Imagination* as follows:

[I]magery can be thought of as a cognitive tool (for those who have it), used to aid many everyday cognitive processes ... Recently it has come to light that many individuals have no experience of imagery at all — their minds are completely blind: aphantasia. In contrast to this, imagery can play a core role in many anxiety disorders, depression, schizophrenia and Parkinson's disease ... Mapping imagery's seemingly contradictory contributions to human cognition, whereby imagery can be advantageous, clinically disruptive, or even unnecessary (aphantasia), offers exciting and novel insights into an important dimension of the human mind. (2020, 175)

Here, Pearson summarizes the puzzling features of mental imagery that have taken central focus in this paper and that MGT seeks to elucidate: architectural promiscuity and psychopathological relevance.

One notable feature of how Pearson introduces imagery here is that his characterization differs from that typically offered by philosophers. Philosophical accounts of mental imagery tend to describe it as a perceptual (or quasi-perceptual) state of mind, playing up its commonalities with perceptual experience in terms of, e.g., phenomenal character, representational content or representational format. Here, the dominant conception of mental imagery is that it is a kind of "off-line" perception. For instance, juxtaposed with Pearson's comments are the following remarks in the *Stanford Encyclopedia of Philosophy's* entry "Imagination" (Liao and Gendler 2019): "To have a (merely) mental image is to have a perception-like experience triggered by something other than the appropriate external stimulus."

This idea that imagery should be conceptualized in perception-like ways is a recurrent theme in the philosophical literature, both new and

old (see Cavedon-Taylor 2021a and 2021b for discussion). Alvin Goldman, for instance, claims that seeing an object and having imagery of an object are "a shared kind of state, in this instance a visual kind of state" (2006a, 47) and claims that there exists "a strong equivalence between visual perception and imagery" (2006b, 154). Bence Nanay claims that mental imagery is "perceptual processing that is not triggered by corresponding sensory stimulation in a given sense modality." (2018, 127) Hume (1739/2000), moreover, writes as follows:

That idea of red, which we form in the dark, and that impression which strikes our eyes in sun-shine, differ only in degree, not in nature. (1.1.1.5)

One reason for interest in MGT is that it bucks this trend by offering an alternative picture of imagery. Granted, MGT is a claim about what imagery *does* whereas these "perceptualist" accounts of imagery aim to say what imagery *is*. And theories of what *X does* and what *X is* are not, of necessity, in conflict. However, an account of mental imagery that defines it as a perceptual experience (or a kind of perceptual processing) will thereby saddle it with purely perceptual functions. Yet if what I have said here is right, then the functions of imagery massively outstrip perceptual ones.<sup>15</sup> More generally, much will be missing from our understanding of mental imagery and the contributions that it makes to human psychology, for good and for ill, if we view it through the "lens" of a single psychological faculty, perceptual or otherwise.<sup>16</sup>

15. My thanks here to one of the journal's anonymous referees. The referee also points out that Pearson may defend a perceptualist account of imagery. For instance, Pearson et al. (2015, 590) characterizes mental imagery as "sensory information without a direct external stimulus." If this is to agree with Goldman, Nanay, Hume and others that we should classify mental imagery as a kind of perceptual state or process, then I stand by my claim that this is at odds with his characterization of mental imagery as an all-purpose "cognitive tool," one that may be "advantageous, clinically disruptive, or even unnecessary (aphantasia)."

16. Thanks to various colleagues at the Open University for a discussion of a previous version of this paper and to three of the journal's anonymous referees for helpful comments.

**References**

- Aleman, A., E. de Haan, and R. Kahn. 2005. "Object Versus Spatial Visual Mental Imagery in Patients with Schizophrenia." *Journal of Psychiatry & Neuroscience* 30: 53–6.
- Arcangeli, M. 2020. "The Two Faces of Mental Imagery." *Philosophy and Phenomenological Research* 101: 304–22.
- Arcangeli, M. 2023. "Aphantasia Demystified." *Synthese* 201 (2): 1–20.
- Altman, E., D. Hedeker, P. Janicak, J. Peterson, and J. Davis. 1994. "The Clinician-Administered Rating Scale for Mania (CARS-M): Development, Reliability, and Validity." *Biological Psychiatry* 36: 124–34.
- Arntz, A. 2012. "Imagery Rescripting as a Therapeutic Technique." *Journal of Experimental Psychopathology* 189–208.
- Audi, R. 1991. "Intention, Cognitive Commitment and Planning." *Synthese* 86 (3): 361–78.
- Blomkvist, A. 2023. "Aphantasia: In Search of a Theory." *Mind & Language* 38: 866–888.
- Bratman, N. 1987. *Intentions, Plans and Practical Reasons*. Cambridge, MA: Harvard University Press.
- Brewin, C., J. Grego, M. Lipton, and N. Burgess. 2010. "Intrusive Images in Psychological Disorders: Characteristics, Neural mechanisms, and Treatment Implications." *Psychological Review* 117: 210–32.
- Briscoe, R. 2008. "Vision, Action and Make-Perceive." *Mind & Language* 23: 457–97.
- Briscoe, R. 2011. "Mental Imagery and the Varieties of Amodal Perception." *Pacific Philosophical Quarterly* 92: 153–73.
- Brockmole, J., R. Wang, and D. Irwin. 2002. "Temporal Integration Between Visual Images and Visual Percepts." *Journal of Experimental Psychology: Human Perception and Performance* 28: 315–34.
- Broome, J. 2001. "Are Intentions Reasons? And How Should we Cope with Incommensurable Values." In *Practical Rationality and Preference: Essays for David Gauthier*, edited by C. Morris and A. Ripstein, 98–120. Cambridge: Cambridge University Press.
- Brown, D. 2018. "Infusing Perception with Imagination." In *Perceptual Memory and Perceptual Imagination*, edited by F. Macpherson and F. Dorsch, 133–60. Oxford: Oxford University Press.
- Buehler, D. 2019. "Flexible Occurrent Control." *Philosophical Studies* 176: 2119–37.
- Cavedon-Taylor, D. 2021a. "Mental Imagery: Pulling the Plug on Perceptualism." *Philosophical Studies* 178 (12): 3847–68.
- Cavedon-Taylor, D. 2021b. "Untying the Knot: Imagination, Perception and their Neural Substrates." *Synthese* 199, 7203–7230.
- Cavedon-Taylor, D. 2022. "Aphantasia and Psychological Disorder: Current Connections, Defining the Imagery Deficit and Future Directions." *Frontiers in Psychology*, <https://doi.org/10.3389/fpsyg.2022.822989>.
- Crane, C., D. Shah, T. Barnhofer, and E. Holmes. 2012. "Suicidal imagery in a Previously Depressed Community Sample." *Clinical Psychology & Psychotherapy* 19: 57–69.
- Currie, G., and I. Ravenscroft. 2002. *Recreative Minds*. Oxford: Oxford University Press.
- D'Argembeau, A., O. Renaud, and M. Van der Linden. 2011. "Frequency, Characteristics and Functions of Future-Oriented Thoughts in Daily Life." *Applied Cognitive Psychology* 25: 96–103.
- Eddy, J. K., and A. L. Glass. 1981. "Reading and Listening to High and Low Imagery Sentences." *Journal of Verbal Learning and Verbal Behavior* 20: 333–45.
- Farah, M. J., D. N. Levine, and R. Calvanio. 1988. "A Case Study of Mental Imagery Deficit." *Brain and Cognition* 8: 147–64.
- Finke, R. and M. Schmidt. 1977. "Orientation-Specific Color Aftereffects Following Imagination." *Journal of Experimental Psychology: Human Perception and Performance* 3: 599–606.
- Finke, R., and S. Kosslyn. 1980. "Mental Imagery Acuity in the Peripheral Visual Field." *Journal of Experimental Psychology: Human Perception and Performance* 6: 126–39.

- Gauker, C. 2011. *Words and Images*. Oxford: Oxford University Press.
- Gaesser, B. and D. Schacter. 2014. "Episodic Simulation, Memory, and Empathy." *Proceedings of the National Academy of Sciences* 111: 4415–20.
- Goldman, A. 2006a. "Imagination and Simulation in Audience Responses to Fiction." In *The Architecture of the Imagination*, edited by S. Nichols, 41–56. Oxford: Oxford University Press.
- Goldman, A. 2006b. *Simulating Minds*. Oxford: Oxford University Press.
- Grush, R. 2004. "The Emulation Theory of Representation: Motor Control, Imagery, and Perception." *Behavioral and Brain Sciences* 3: 377–96.
- Gregory, L., R. Cialdini, and K. Carpenter. 1982. "Self-Relevant Scenarios as Mediators of Likelihood Estimates and Compliance: Does Imagining Make It So?" *Journal of Personality and Social Psychology* 43: 89–99.
- Gregory, D. 2016. "Imagination and Mental Imagery." In *The Routledge Handbook of Philosophy of Imagination*, edited by A. Kind, 97–110. Routledge.
- Hackmann, A., J. Bennett-Levy, and E. Holmes. 2011. *Oxford Guide to Imagery in Cognitive Therapy*. Oxford: Oxford University Press.
- Hirsch, C., D. Clark, D. Matthews, and R. Williams. 2003. "Self-Images Play a Causal Role in Social Phobia." *Behaviour Research and Therapy* 41: 909–92.
- Holmes, E., J. Geddes, F. Colom, and G. Goodwin. 2008. "Mental Imagery as an Emotional Amplifier: Application to Bipolar Disorder." *Behaviour Research and Therapy* 46: 1251–8.
- Holmes, E., M. Bonsall, S. Hales, H. Mitchell, F. Renner, S. Blackwell, P. Watson, G.M. Goodwin, and M. Di Simplicio. 2016. "Applications of Time-Series Analysis to Mood Fluctuations in Bipolar Disorder to Promote Treatment Innovation: A Case Series." *Translational Psychiatry* 6, e720.
- Hume, D. 1739/2000. *A Treatise of Human Nature*. Oxford: Oxford University Press.
- Ivins, A., M. Di Simplicio, H. Close, G. Goodwin, and E. Holmes. 2014. "Mental Imagery in Bipolar Affective Disorder Versus Unipolar Depression: Investigating Cognitions at Times of 'Positive' Mood." *Journal of Affective Disorders* 166: 234–42.
- Jamison, K.R. 2009. *Nothing Was the Same*. New York, NY: Random House.
- Kang, S., S. Sponheim, M. Chafee, and A. MacDonald. 2011. "Disrupted Functional Connectivity for Controlled Visual Processing as a Basis for Impaired Spatial Working Memory in Schizophrenia." *Neuropsychologia* 49: 2836–47.
- Keogh, R. and J. Pearson. 2018. "The Blind Mind: No Sensory Visual Imagery in Aphantasia." *Cortex* 105: 53–68.
- Kind, A. 2013. "The Heterogeneity of the Imagination." *Erkenntnis* 78: 141–59.
- Kind, A. 2018. "Imaginative Presence." In *Perceptual Presence*, edited by F. Dorsch, F. Macpherson and M. Nide-Rumelin. OUP.
- Kind, A. and Kung, P. 2016. "Introduction: The Puzzle of Imaginative Use." In *Knowledge Through Imagination*, edited by A. Kind and P. Kung. OUP.
- Kriegel, U. 2013. "Entertaining as a Propositional Attitude." *American Philosophical Quarterly* 50: 1–22.
- Langland-Hassan, P. 2015. "Imaginative Attitudes." *Philosophy and Phenomenological Research* 90: 664–86.
- Langland-Hassan, P. 2020. *Understanding the Imagination*. Oxford: Oxford University Press.
- Liao, S-Y., and T. Gendler. 2019. "Imagination." In *Stanford Encyclopedia of Philosophy*, edited by E.N. Zalta, accessed winter 2019 <URL = <https://plato.stanford.edu/archives/win2019/entries/imagination/>>.
- Libby, L., E. Shaeffer, R. Eibach, and J. Slemmer. 2007. "Picture Yourself at the Polls: Visual Perspective in Mental Imagery Affects Self-perception and Behavior." *Psychological Sciences* 18: 199–203.
- Malik A., G. Goodwin L. Hoppitt, and E. Holmes. 2014. "Hypomanic Experience in Young Adults Confers Vulnerability to Intrusive Imagery After Experimental Trauma: Relevance for Bipolar Disorder." *Clinical Psychological Science* 2: 675–84.

- Malle, B., and J. Knobe. 2001. "The Distinction Between Desire and Intention: A Folk-Conceptual Analysis." In *Intentions and Intentionality: Foundations of Social Cognition*, edited by B. Malle, L. Moses and D. Baldwin, 45–67. Cambridge, MA: MIT Press.
- Martin, K., and C. Hall. 1995. "Using Mental Imagery to Enhance Intrinsic Motivation." *Journal of Sport & Exercise Psychology* 17: 54–69.
- Martin, M. 2002. "The Transparency of Experience." *Mind & Language* 17: 376–425.
- McGill, B., and M. Moulds. 2014. "Characteristics of Autobiographical Memories and Prospective Imagery Across a Spectrum of Hypomanic Personality Traits." *Memory* 22: 1139–48.
- Morina, N., C. Deeptose, C. Pusowski, M. Schmid, and E. Holmes. 2011. "Prospective Mental Imagery in Patients with Major Depressive Disorder or Anxiety Disorders." *Journal of Anxiety Disorders* 25: 1032–7.
- Moro, V., G. Berlucchi, J. Lerch, F. Tomaiuolo, and S. Aglioti. 2008. "Selective Deficit of Mental Visual Imagery with Intact Primary Visual Cortex and Visual Perception." *Cortex* 44: 109–18.
- Morrison, A., N. Amir, and C. Taylor. 2011. "A Behavioural Index of Imagery Ability in Social Anxiety." *Cognitive Therapy and Research* 35: 326–32.
- Nanay, B. 2010. "Perception and Imagination: Amodal Perception as Mental Imagery." *Philosophical Studies* 150: 239–54.
- Nanay, B. 2018. "Multimodal Mental Imagery." *Cortex* 105: 125–34.
- Newby, J.M., and M.L. Moulds. 2011. "Characteristics of Intrusive Memories in a Community Sample of Depressed, Recovered Depressed and Never-Depressed Individuals." *Behaviour Research and Therapy* 49: 234–43.
- Ng, R., S. Burnett Heyes, F. McManus, H. Kennerley, and E. Holmes. 2016. "Bipolar Risk and Mental Imagery Susceptibility in a Representative Sample of Chinese Adults Residing in the Community." *International Journal of Social Psychiatry* 62 (1): 94–102.
- O'Donnell, C., M. Di Simplicio, R. Brown, E. Holmes, and S. Burnett Heyes. 2018. "The Role of Mental Imagery in Mood Amplification." *Cortex* 105: 104–17.
- Oertel, V., A. Rotarska-Jagiela, V. van de Ven, C. Haenschel, M. Grube, and U. Stangier. 2009. "Mental Imagery Vividness as a Trait Marker Across the Schizophrenia Spectrum." *Psychiatry Research* 167: 1–11.
- Pearson, D., C. Deeptose, D. Wallace-Hadrill, D. Heyes, and E. Holmes. 2013. "Assessing Mental Imagery in Clinical Psychology: A Review of Imagery Measures and a Guiding Framework." *Clinical Psychology Review* 33: 1–23.
- Pearson, J., T. Naselaris, E. Holmes, and S. Kosslyn. 2015. "Mental Imagery: Functional Mechanisms and Clinical Applications." *Trends in Cognitive Science* 19: 590–602.
- Pearson, J. 2020. "The Visual Imagination." In *Cambridge Handbook of the Imagination*, edited by A. Abraham, 175–86. Cambridge: Cambridge University Press.
- Peckham, A., K. Modavi, and S. Johnson. 2020. "Looking on the Bright Side and Seeing it Vividly: Interpretation Bias and Involuntary Mental Imagery are Related to Risk for Bipolar Disorder." *Behavioural and Cognitive Psychotherapy* 48: 203–15.
- Perky, C.W. 1910. "An Experimental Study of Imagination." *American Journal of Psychology* 21: 422–52.
- Pounder, Z., J. Jacob, S. Evans, C. Loveday, A. Eardley, and J. Silvanto. 2022. "Only Minimal Differences between Individuals with Congenital Aphantasia and those with Typical Imagery on Neuropsychological tasks that Involve Imagery." *Cortex* 148: 180–92.
- Pettersson, M. 2011. "Seeing what is not There: Pictorial Experience, Imagination and Non-Localization." *British Journal of Aesthetics* 51: 279–94.
- Pham, L., and S. Taylor. 1999. "From Thought to Action: Effects of Process-Versus Outcome-Based Mental Simulations on Performance." *Personality and Social Psychology Bulletin* 25: 250–60.
- Prinz, J. 2002. *Furnishing the Mind*. Cambridge, MA: MIT Press.
- Quilty-Dunn, J. 2020. "Perceptual Pluralism." *Noûs* 54: 807–38.
- Ratcliffe, M. 2014. *Experiences of Depression*. Oxford: Oxford University Press.

- Robbins, S. 2017. "Memory Traces." In *The Routledge Handbook of Philosophy of Memory*, edited by S. Bernecker & K. Michaelian, 76–87. London: Routledge.
- Schacter, D., D. Addis, and R. Buckner. 2007. "Remembering the Past to Imagine the Future: The Prospective Brain." *Nature Reviews Neuroscience* 8: 657–61.
- Segal, S. 1971. "Processing of the Stimulus in Imagery and Perception." In *Imagery: Current Cognitive Approaches*, edited by S.J. Segal, 69–100. New York, NY: Academic Press.
- Segal, S. 1972. "Assimilation of a Stimulus in the Construction of an Image: The Perky Effect Revisited." In *The Function and Nature of Imagery*, edited by P. Sheehan. New York, NY: Academic Press.
- Schellenberg, S. 2018. *The Unity of Perception*. Oxford: Oxford University Press.
- Sinhababu, N. 2017. *Humean Nature*. Oxford: Oxford University Press.
- Thomas, A. 2009. "Perceptual Presence and the Productive Imagination." *Philosophical Topics* 37: 153–74.
- Tulving, E. 2002. "Episodic Memory: From Mind to Brain." *Annual Review of Psychology* 53: 1–25.
- Van Leeuwen, N. 2011. "Imagination is where the action Is." *Journal of Philosophy* 108: 55–77.
- Watzl, S. 2014. "Perceptual Guidance." *Ratio* 27: 414–38.
- Weßlau, C., and R. Steil. 2014. "Visual Mental Imagery in Psychopathology — Implications for the Maintenance and Treatment of Depression." *Clinical Psychology Review* 34: 273–81.
- Wicken, M., R. Keogh, and J. Pearson. 2021. "The Critical Role of Mental Imagery in Human Emotion: Insights from Fear-Based Imagery and Aphantasia." *Proceedings of the Royal Society B. Biological Sciences* 288: 20210267.
- Williams, J., N. Ellis, C. Tyers, H. Healy, G. Rose, and A. MacLeod. 1996. "The Specificity of Autobiographical Memory and Imageability of the Future." *Memory & Cognition* 24: 116–25.
- Wiltsher, N. 2019. "Imagination: A Lens, not a Mirror." *Philosophers' Imprint* 19: 1–30.
- Wolpert, L. 1999. *Malignant Sadness: The Anatomy of Depression*. London: Faber and Faber.
- Wu, W. 2014. "Against Division: Consciousness, Information, and Visual Stream." *Mind & Language* 29: 383–406.
- Zeman, A., S. Della Sala, L. A. Torrens, V. E. Gountouna, D. J., McGonigle, and R. H. Logie. 2010. "Loss of Imagery Phenomenology with Intact Visuo-Spatial Task Performance: A Case of 'Blind Imagination.'" *Neuropsychologia* 48: 145–55.
- Zeman, A., M. Dewar, and S. Della Sala. 2015. "Lives without Imagery: Congenital Aphantasia." *Cortex* 73: 378–80.
- Zeman, A. 2020. "Aphantasia." In *The Cambridge Handbook of the Imagination*, edited by A. Abrahams, 692–710. Cambridge: Cambridge University Press.