The Epistemic Structure of the Imagination

by

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Abstract

The imagination is ubiquitous in our cognitive lives. You might imagine rotating a puzzle piece to determine whether it fits in an open space, or imagine what things are like from another person's perspective to figure out how they are feeling, or imagine a new rug in your living room to determine whether it matches the color of your sofa. These examples are mundane, but they point to a deep philosophical puzzle: how could merely imagining something give you any reason to believe that it is true? After all, you can imagine anything you want to, from the fictional to the fantastical. This has led many philosophers to be deeply skeptical of the epistemic value of the imagination. When imagination is accorded a justificatory role, it is typically limited to beliefs about what is metaphysically possible. More recently, some philosophers have begun to push back against this orthodoxy by arguing that the imagination can justify empirical beliefs about the actual world. But even then, most contemporary discussions focus on *whether* the imagination can justify empirical belief, rather than on *how* the imagination justifies empirical belief, thereby leaving many central questions about the epistemology of the imagination unanswered.

This dissertation attempts to fill this lacuna by canvassing the theoretical landscape of this exciting new literature and developing an account of the epistemic structure of the imagination. The first chapter sets the stage for the rest of the dissertation by reviewing extant arguments for and against the view that the imagination can justify

empirical belief before posing a new argument in its favor. The second chapter argues that imaginative justification is mediate but non-inferential; it depends on one's prior justification without depending on an inference from one's prior beliefs. The third chapter argues that the imagination is informative—it can represent new content and generate new justification—in virtue of its analog representational format. The fourth and final chapter argues that some imaginings just *are* beliefs, and that this grounds their justificatory force. Together, the arguments of this dissertation suggest that the imagination is a distinctive kind of ampliative reasoning, and that it plays this cognitive and epistemic role by combining the analog representational format of imagery with the evidence-sensitive function of belief.

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Introduction

Consider the extent to which the imagination is implicated in something as mundane as preparing dinner. You imagine a map of your neighborhood to determine the shortest route to the grocery store. Once you are at the grocery store, you imagine the flavors of two ingredients to decide whether they will go well in a dish together. On your way back home, you imagine what your partner's day was like to predict what kind of mood they will be in when they get home. As you are preparing dinner, you imagine biting into a piece of potato to determine whether you have successfully chopped them into bite-size pieces. After dinner, you imagine packing away the leftovers to figure out whether they will fit in the smaller container or whether you need to grab a larger one.

In each of these cases, you use your imagination to form a belief about the actual world. And these are just a small representative sample of the myriad ways that imagination is implicated in reasoning and decision-making. But despite the ubiquity of the imagination in our cognitive lives, philosophers have had surprisingly little to say about its epistemology. To date, most work on epistemology of imagination is aimed at answering the question of whether the imagination can justify beliefs. While this is an important and interesting question, answering it is merely a precursor to a proper epistemology of imagination. The comparatively more mature literature on epistemology of perception, for example, is not gripped with the question of whether perception

justifies belief but instead asks rich and subtle questions about the nature, structure, and scope of perceptual justification. My goal in this dissertation is to explore analogous questions in the context of imagination: What does imaginative justification consist in? How does imaginative justification relate to other justification? Can the imagination generate new justification, or does it merely preserve existing justification? What kinds of beliefs can the imagination justify? And what can the epistemic role of the imagination tell us about its nature?

The dissertation is comprised of four chapters. Here is a brief overview of each:

The first chapter, 'Can Imagination Justify Belief?,' sets the stage for the rest of the dissertation by arguing that the imagination can justify empirical beliefs. I survey the extant literature on epistemology of imagination, pointing out the philosophical and dialectical shortcomings of arguments that have been advanced both for and against imaginative justification, before offering a new argument in favor of imaginative justification. The core of the argument is that the imagination is ubiquitous in our cognitive lives, and that denying the justificatory force of the imagination therefore results in an unpalatable skeptical conclusion.

The second chapter, 'The Structure of Imaginative Justification,' investigates whether imaginative justification depends on a subject's prior justification, and if so, in what way. I consider, explore, and ultimately reject two views that have been defended

in the literature. According to first, imaginings confer immediate justification—justification that does not depend on any prior justification. According to the second, imaginings only confer justification in tandem with a separate inference from prior beliefs. In their place, I argue that imaginative justification is mediate but non-inferential. Imagination justifies belief in a way that depends on prior evidence, but without the need for any intervening inference.

The third chapter, 'How Imagination Informs,' examines an influential line of thought according to which imaginings are not informative since, as Sartre puts it, "it is impossible to find in the image anything more than what was put into it." This chapter argues for a novel response to this objection that appeals to the representational format of the imagination. The core idea is that the imagination represents analogically, and that analog representations are relationally fecund: they explicitly represent relations "for free." This yields a powerful account of how imagination informs. This account makes significant contributions to both philosophy of mind, since it shows how the imagination can generate new content that is not represented by a subject's antecedent mental states, and epistemology, since it shows how the imagination can generate new justification that is not conferred by a subject's antecedent evidence.

The fourth chapter, "Imaginative Beliefs," argues for the existence of imaginative beliefs: mental states that are simultaneously imaginative and doxastic in nature. My

arguments for this thesis rest on the claim that there is a robust class of imaginings that play both the functional and epistemic roles of belief. I also argue that this view fares better than alternatives that posit distinct imaginative and doxastic states to account for the same phenomena. Along the way, I make the case for the theoretical significance of imaginative beliefs by showing how they pose a challenge for standard taxonomies of the mind, explain the epistemic role of the imagination, clarify the sense in which imagination is voluntary and occurrent, undermine a popular theory of the nature of the imagination, and point to a deep but underappreciated symmetry between imagistic and non-imagistic thought.

Although each chapter can be read on its own, they are more fruitfully seen as cumulative, each building on the last to paint an overarching picture of the epistemic structure of the imagination. As they say, a picture is worth a thousand words (or, in the case of this dissertation, nearly 60,000 words). But, to summarize it in a sentence: the imagination is a distinctive kind of ampliative reasoning, and it plays this cognitive and epistemic role by combining the analog representational format of imagery with the evidence-sensitive function of belief. The imagination therefore occupies an underexplored and undertheorized quadrant of conceptual space within epistemology.

While my goal is to argue for an account of how the imagination justifies belief, I will be satisfied if I can make the case for the importance and interest of the epistemology

of imagination as a philosophical enterprise, and to canvas the theoretical landscape it comprises. The epistemology of imagination is still in its infancy, having only consolidated as a distinct subdiscipline within the last decade or so, and many of the issues and questions that have been explored extensively in the epistemologies of perception, memory, testimony, and inference have simply not been investigated in the context of the imagination. The goal of this dissertation, therefore, is just as much about setting the agenda for future research as it is about arguing for a particular set of views.

The project of this dissertation—to develop an account of how imaginings justify beliefs—primarily falls under the banner of epistemology. However, it is replete with connections to philosophy of mind and the cognitive sciences. There isn't a single chapter that doesn't rely on empirical results about how the imagination works, and many of the chapters (most notably three and four) defend conclusions about the nature of the imagination in addition to its epistemology. Indeed, one of the recurring themes of the dissertation is that theorizing about the normative-epistemic role of the imagination is fruitfully informed by theorizing about its descriptive-causal role, and vice versa.

The material in this dissertation bears important connections to my previously published work. Myers 2021a argues that imaginings are justified justifiers; they can have an epistemic status and this epistemic status grounds their ability to justify beliefs. Chapter 2 can be seen as a prequel to this paper—fleshing out the argument for the

premise that imaginative justification is mediate—while Chapter 4 can be seen as a sequel—exploring how to fit the thesis that imaginings are epistemically evaluable into a cohesive view of the nature of the imagination. Myers 2021b argues that imagination is a *sui generis* form of reasoning. This is a theme that runs throughout the entire dissertation, from the analogies between imagination and reasoning that Chapter 1 uses defuse arguments against imaginative justification, to the discussion of how imaginings can be epistemically based on evidence in Chapter 4. Finally, Lee, Myers, and Rabin 2023 defends a theory of the nature of analog representation. Chapter 3 can be viewed as an attempt to draw out some of the epistemological implications of this theory. Although the views presented in this dissertation form a coherent package with the views presented in my prior work, I will not presuppose any of this prior material in what follows.

Finally, a note on the title. I could just as aptly have titled this dissertation 'The Epistemic Nature of the Imagination' or 'The Epistemic Role of the Imagination' or some other close-by cognate. However, as we will see, the notion of structure recurs throughout the dissertation. Chapter 2 investigates the structure of imaginative justification itself. Chapters 3 and 4 investigate how the representational and attitudinal structure of the imagination, respectively, explain its epistemic power. Finally, one of the major upshots of chapter 3 is that the imagination plays a special role in allowing us to learn about the structure of the world. Hence, 'The Epistemic Structure of the Imagination.'

Chapter 1

Can Imagination Justify Belief?

1.1 Introduction

The core question at the heart of the epistemology of imagination, and at the heart of this dissertation, is this: how does the imagination justify empirical belief? But before we can begin to answer this question, we need to answer a more fundamental question: can the imagination justify empirical belief? If the answer to the latter question is 'no', then the former question loses its interest, and the epistemology of imagination does not even get off the ground.

This worry is especially pressing because, until recently, the view that the imagination is epistemically inert was the orthodox, received view. One can find it as far back as Plato, who claims that imaginings are merely deficient and misleading images of the objects of the senses, which themselves are deficient and misleading images of the Forms, rendering imaginings doubly illusory. For Plato, imagination (or eikasia) corresponds to the lowest form of cognition. Descartes also takes a dismissive view towards the imagination, using the famous example of a piece of wax to argue that knowledge of external objects is not achieved through the imagination, and even going

so far as to argue that the imagination is not essential to our nature as thinking beings and is thus entirely dispensable.

The claim that the imagination is epistemically inert finds more explicit support within the past 100 years. Davies, writing at the beginning of the 20th century, assesses the contemporary and historical literature on the imagination by saying that "scant courtesy has been given to the imagination as being concerned with the elucidation of those objects and problems with which knowledge in its many forms is engaged," and that it is a tacit assumption throughout philosophy that "the imagination has no cognitive value" (1907, p. 645). One can find this dismissive attitude towards the epistemic value of the imagination in figures as philosophically and methodologically different as Sartre and Wittgenstein. Sartre remarks that "nothing can be learned from an image that is not already known." (1948 p. 12) and that "the image teaches nothing" (1948 p. 147). Wittgenstein, writing at around the same time, makes the strikingly similar point that imaginings "tell us nothing," and therefore do "not instruct us about the external world" (1948/1980 p. 15).

Support for the claim that imagination cannot justify empirical belief persists up into the present day. Within the imagination literature, O'Shaugnessy remarks that the imagination is "out of the cognitive circuit" (2000 p. 357), Spaulding argues that imagination "is limited to the context of discovery," rather than the context of justification

(2016 p. 207), and Levy & Kinberg write that "the human imagination is unlikely to be a good source of concrete, mundane knowledge" (2022 p. 15). Within the broader epistemology literature, Tucker claims that "the imagined image can't even prima facie justify its content" (2010, p. 533), Chudnoff writes that "imagining that p never justifies you in believing that p," (2012, p. 69) , and Markie states offhand that "imaginings, hopes and the like are not sources of justification," (2015, p. 348). In many cases, these claims are taken to be so obvious that no argument is provided for them.

Against this historical and dialectical backdrop, extra care must be given towards motivating the epistemology of imagination as a philosophical enterprise. That is exactly what I want to do in the present chapter. I will proceed as follows. §1.2 clarifies what it means to say that the imagination can justify empirical belief. §1.3 and §1.4 review and evaluate extant arguments against and for this thesis, respectively. §1.5 advances a novel argument for the claim that the imagination can justify empirical belief—the argument from skeptical consequences—and makes the case that this argument is more powerful and decisive than other arguments that have been proposed for the same conclusion.

1.2 Clarifying the Question

Let us say that *optimism* about imaginative justification is the view that imaginings can justify empirical belief. By contrast, let us say that *pessimism* about imaginative justification is the view that imaginings cannot justify empirical belief.

The theoretical interest of optimism and pessimism, and of the epistemology of imagination more generally, is best demonstrated by considering the multitude of ways that the imagination is implicated in our epistemic lives. Consider the following array of cases:

> *Jaywalking*: You are rushing from your apartment to the class you need to teach at the philosophy department. As you prepare to cross Bleecker Street, you notice that a car is approaching. In order to decide whether you have enough time to safely cross the street, you imagine briskly walking across the street while the car approaches at a steady pace. As your imaginative episode unfolds, you imagine making it to the other side while the car is still a comfortable distance away. Based on this imagining, you form the belief that you can safely cross the street.

> *Busy Day*: You notice that your partner is acting uncharacteristically irritable when they come home from work. In order to figure out what might be causing them to act this way, you imagine what their day was like from their perspective. You know that they had lots of meetings and errands today, so you imagine rushing from place to

place, scarfing down a quick lunch while on the go, and sitting on a cramped subway car during the commute home. Based on this imagining, you form the belief that your partner is feeling drained from a long day at work and that they must be hungry for dinner.

Mental Rotation: You are a subject in a psychological experiment on mental rotation. You are presented with two figures and asked whether they are identical or not. To figure out, you imagine rotating one such that it is in the same orientation as the other. Based on this imagining, you form the belief that the two figures are the same.

Recipe Planning: You are planning what to cook for dinner tonight. You recall that you have some artichokes, a jar of kimchi, and some peanut butter in your kitchen. In order to figure out whether these ingredients will go together in a stew, you imagine what an artichoke, kimchi, and peanut butter stew would taste like. You imagine the flavor as being highly unpleasant. Based on this imagining, you form the belief that artichokes, kimchi, and peanut butter would not go well together in a stew.

In each of these cases, you use your imagination as a guide to belief-formation. Moreover, these are just a small representative sample of the myriad ways that imagination is implicated in belief formation. Other examples that have been invoked in the literature include using your imagination to gauge whether a table will be able to fit through a doorway (Dorsch 2016), using your imagination to figure out whether you are able to jump across a small stream (Williamson 2016), and using your imagination to determine how many windows are on the outside of your house (Munro 2021).

Given how commonplace it is to use the imagination to form beliefs, the debate over optimism has far-reaching consequences for how to think about the rationality of our everyday belief-forming practices. Moreover, given the ways that the imagination is implicated in scientific practice[1] and engagement with fiction,[2] the truth or falsity of optimism also has implications for related debates about the ability of scientific thought experiments and fictional narratives to yield justification.

Before I can defend optimism about imaginative justification, I first need to clarify what it says. This will involve unpacking the concepts of imagination, epistemic justification, and empirical belief that will be at issue over the course of the rest of the dissertation.

[1] For recent work on the role of imagination in science see Levy & Godfrey-Smith 2019 and Murphy 2022.
[2] A seminal and highly influential book on this subject is Walton 1990. For recent work on the role of imagination in engagement with fiction see Engisch & Langkau 2023

1.2.1 Imagination

Optimism states that *imagination* can justify empirical belief. What do I mean by imagination? Taxonomies of imagination abound in contemporary philosophy of imagination. It is a commonly observed truism that 'imagination' is a heterogenous term used to refer to many different types of mental states, processes, and systems (Kind 2013). A non-exhaustive survey of the distinctions that have been drawn between different types of imagination reveals a state of terminological and conceptual overabundance: recreative vs. creative imagination (Currie and Ravenscroft 2002), belief-like vs. desire-like vs. perception-like imagination (Currie and Ravenscroft 2002, Schellenberg 2013), imagining vs. supposing vs. conceiving (Balcerak Jackson 2016), propositional imagination vs. objectual imagination (Yablo 1993), spontaneous vs. deliberate imagination (Walton 1990), constructive vs. imagistic vs. attitudinal imagination (Van Leeuwen 2013), transcendent vs. instructive imagination (Kind and Kung 2016), system 1 imagination vs. system 2 imagination (Stuart 2019), and imaginative states vs. imaginative processes (Wiltsher 2021), to name just a few of the different taxonomies that have been proposed.

There is no reason from the outset, especially considering the diversity of kinds of imagination canvassed above, to think that all the uses of the word 'imagination' refer to a single unified cognitive kind. And, importantly for our purposes, there is no reason

from the outset to think that all these kinds of imagination will be epistemically similar. When doing epistemology of imagination, we need to be careful about what notion of imagination we are operating with.

The main distinction that I wish to emphasize is between *imagistic imagination* (sometimes also called 'sensory' or 'perceptual' imagination) and *propositional imagination* (sometimes also called 'belief-like' or 'suppositional' imagination).

Imagistic imagination is imagination that involves mental imagery. By mental imagery, I mean endogenously generated sensory representation, construed broadly to include all the sense modalities. Examples of imagistic imagining include auditorily imagining the sound of your favorite song, tactilely imagining the texture of your pet's fur, visually imagining what it looks like to see a beautiful sunset, or proprioceptively imagining what it feels like to do a push up.

Propositional imagination is imagination that does not involve any mental imagery.[3] Examples of propositional imagining include imagining that the next president of the United States will be a woman and imagining that your great-great-grandmother was

[3] In using the term 'propositional imagination,' I follow common terminological practice in the literature. However, it is worth pointing out that this term is potentially misleading. There is a debate over whether mental images have propositional content (Nanay 2015, Grzankowski 2015). But the distinction between imagistic and propositional imagination is orthogonal to this debate. The imagistic/propositional distinction captures a difference in the vehicles of imagination (whether they involve mental images or not), rather than imaginative contents (whether they are propositional or not).

lefthanded. In both cases, your imaginative project involves merely entertaining the relevant proposition without any corresponding mental imagery.

There are interesting epistemological issues that arise with respect to both imagistic and propositional imagination, and both forms of imagination have been invoked in the literature on the epistemology of imagination. However, in this dissertation, I will primarily focus on imagistic imagination. I do so for several reasons.

First, our arguments for optimism should apply to and explain actual, everyday cases of imaginative belief-formation. This is reason to formulate optimism in terms of the kind of imagination that these actual, everyday cases involve. And as it turns out, all of the cases of imaginative belief-formation canvassed above involve imagistic imagination. *Mental Rotation* involves visual imagery, while *Recipe Planning* involves gustatory imagery. *Jaywalking* and *Busy Day* are more complex, involving a mixture of visual, auditory, proprioceptive, and motor imagery. Moreover, the examples that are commonly invoked in the extant literature—imagining moving a table through a doorway, imagining jumping across a small stream, imagining the exterior of your house—all involve imagistic imagination as well. Thus, focusing on imagistic imagination is responsive to the examples that are invoked in the extant literature.

Second, most of the resistance to optimism hinges on features that are unique to imagistic imagination. Consider a case in which you propositionally imagine that *p*, and

find that you propositionally imagine that *q* as a result. You do not form a belief that *q*, because you merely imagine, rather than believe, the premise. Instead, you form the conclusion that *if p then q*.[4] This is a standard example of hypothetical reasoning, and this is typically the kind of justificatory power that is claimed for propositional imagination.[5] But most opponents of optimism do not mean to be wholesale skeptics about hypothetical reasoning.[6] After all, hypothetical reasoning proceeds by the same inference rules as analogous reasoning with beliefs. So, skepticism about hypothetical reasoning threatens to expand into skepticism about inference in general. This would be a radical conclusion. Opponents of optimism typically hold that there is something distinctive about mental imagery that supports pessimism, rather than something common across different forms of propositional reasoning.

Third, and finally, my own positive account of the epistemic role of the imagination crucially hinges on distinctive features of the imagistic imagination. In my view, the imagination plays the epistemic role that it does precisely in virtue of the fact

[4] One might object that standard hypothetical reasoning involves supposing the premise rather than propositionally imagining it. However, almost everyone agrees that propositional imagination involves an element of supposition, even if it also involves some additional components (such as immersion and emotional affect). Thus, it should be relatively uncontroversial that one can engage in hypothetical reasoning with propositional imagination.

[5] See Williamson 2016, Badura 2021, Berto 2021, and Schoonen 2021.

[6] Levy and Kinberg, who offer one of the most recent and most detailed arguments against optimism, explicitly set hypothetical reasoning aside as falling outside the scope of their arguments (2022 p.3)

that it involves mental imagery. I will argue for this most explicitly in chapter 3, but it will be a running theme throughout the rest of the dissertation.

In what follows, all uses of 'imagination' should be taken to refer to imagistic imagination. This is the core sense of imagination at issue. I will only draw attention to the distinction between imagistic and propositional imagination where it is relevant.

1.2.2 Empirical Belief

Optimism states that imagination can justify *empirical* belief. Simply put, empirical beliefs are beliefs towards contingent propositions about the external world. I will understand the notion of empirical belief rather capaciously. It includes propositions about the past and future. For example, in *Jaywalking,* you form a belief about whether you *will* be able to safely cross the street. It also includes propositions about your own past and future mental states, as well as the mental states of others. For example, in *Busy Day,* you form a belief about the mental state of your partner. I will also understand empirical beliefs to include beliefs with counterfactual contents. For example, in *Recipe Planning,* you form a belief about whether certain ingredients *would* taste good together.

This characterization of empirical beliefs rules out at least two widely discussed epistemic roles of the imagination from falling under the banner of optimism. First, imaginings obviously play some role in justifying your beliefs about your own current imaginings. For example, imagining a beautiful sunset can ground introspective

knowledge that you are currently imagining a beautiful sunset. But in this case, you use introspection to learn about your imagination rather than using your imagination to learn about the world. Compare: one's perceptual experience of an oak tree can ground introspective knowledge that one is having a perceptual experience. But it is the task of an epistemology of introspection to account for such knowledge, rather than the epistemology of perception. Since I am interested in the epistemology of the imagination, and not the epistemology of introspection, I will set introspective knowledge of one's imaginings to the side.

Second, there has been much debate and discussion over whether imaginings can justify modal beliefs about what is metaphysically possible or metaphysically necessary. For example, some theorists have argued that if some proposition is conceivable (by which they mean propositionally imaginable), then it is metaphysically possible (Chalmers 2002, Yablo 1993). Other theorists have articulated views about the role that the imagination plays in justifying modal beliefs that hinge crucially on features of imagistic imagination (e.g. Balcerak Jackson 2018, Kung 2010, Gregory 2020).

I will set aside modal beliefs in what follows. One reason for this is that propositions about what is possible or necessary are plausibly themselves necessary, while the uses of imagination that I am interested in all involve coming to believe contingent propositions. But the deeper reason is simply that I suspect that imaginative

justification of modal beliefs and imaginative justification of empirical beliefs involve very different epistemic structures. To oversimplify a bit, proponents of imaginative modal justification hold that one simply has to be able to imagine that *p* in order to get justification for believing that *p is possible*. But being able to imagine that *p* is far too unconstrained for imaginative *empirical* justification—we are clearly able to imagine things that are not actual. So, if the imagination can justify empirical belief, it will have to be through a different route than mere imaginability.

For ease of explication, I will sometimes gloss optimism as the thesis that imagination can confer justification, leaving it implicit that it concerns justification of empirical propositions.

1.2.3 Epistemic Justification

Optimism says that imaginings can *justify* empirical belief. Epistemic justification is a positive epistemic status. To say a belief is epistemically justified is to say that it is epistemically appropriate to hold it. Thus, epistemic justification is an evaluative notion.

To say that something justifies a belief is to say that it makes it appropriate to hold that belief. When something justifies a belief, we can say that it has justificatory force. Justificatory force is always relative to a particular proposition. For example, a perceptual experience of a red patch has justificatory force with respect to the proposition that there is a red patch, but not with respect to the proposition that there is a blue patch.

Nevertheless, I will say that a state or process has justificatory force *simpliciter* when it is the kind of thing that can make some belief or other epistemically appropriate. For example, perceptual experiences are the kinds of things which can make beliefs epistemically appropriate and thus have justificatory force, while random guessing cannot make beliefs epistemically appropriate and thus does not have justificatory force. Another way of framing optimism, then, is as the claim that some imaginings have justificatory force.

To the extent that it is possible, I will try to remain relatively neutral about debates over the nature of justification, as well as about how justification relates to other epistemic notions such as rationality and knowledge. For example, my arguments are compatible with both internalism and externalism about justification. This is not to say that my arguments have no bearing on broader debates about justification. At various points throughout the dissertation, claims that I make about imaginative justification will have implications for broader debates about the nature of justification. I only claim that I will not assume anything from the outset.

Although I have framed the debate over optimism as carving the space of possibilities in two—either imagination justifies empirical belief or it doesn't—the space of possibilities is better understood as graded and multidimensional, corresponding to all the different dimensions along which justification can differ. There is a considerable

amount of crosstalk in the literature on epistemology of imagination due to the fact that different theorists understand the notion of justification differently without being totally explicit about the assumptions they are making. Therefore, let me make a few more clarifications about how I will understand the notion of justification that is invoked in optimism.

First, I will understand optimism as primarily concerning propositional justification, as opposed to doxastic justification.[7] Propositional justification is the justification one has for believing a proposition, regardless of whether one in fact believes it. Roughly, propositional justification corresponds to the notion of having good evidence or good reason for holding a belief. Doxastic justification is the justification that attaches to a well-formed belief. A belief is doxastically justified when it is properly based on adequate propositional justification. Although I will understand optimism in terms of propositional justification, the intimate relationship between propositional and doxastic justification means that optimism also has direct consequences for doxastic justification. If the imagination can confer propositional justification, then basing beliefs on the imagination can yield doxastic justification.

[7] Despite the overlap in terminology, propositional justification should not be confused with propositional imagination. The former is justification for believing a proposition, while the latter is imagination that does not involve mental imagery. Thus, it is not a contradiction to say that non-propositional (i.e. imagistic) imagination can confer propositional justification.

Second, I will understand optimism as neutral with respect to the distinction between immediate and mediate justification. Immediate justification is justification that does not depend on a subject's prior justification. Mediate justification is justification that at least partially depends on a subject's prior justification. Immediate justification can be thought of as justification that is generated anew while mediate justification can be thought of as justification that is at least partially preserved from already existing justification. Optimism does not take a stand on whether the imagination confers immediate or mediate justification.[8] Both of these possibilities correspond to ways for optimism to be true.

Third, I do not assume that imagination must be an indispensable source of justification for optimism to be true. We can say that a source of justification is indispensable if one could not arrive at a justified belief with the same content in any other way. Very few sources of justification are genuinely indispensable in this sense, and there is no reason to think that imagination is any different. Consider the belief you form in *Recipe Planning*. You can get justification for believing that some ingredients do not go well together in a dish by tasting the dish, or by remembering a previous time you tasted the dish, or by getting testimony from a trusted friend that you know shares your gustatory preferences. All these methods—perception, memory, and testimony—are

[8] I will explore the question of whether imaginative justification is immediate or not in chapter 2.

ways of coming to form a justified belief in the same content. This does not undermine the interest or significance of the view that imagination is also a way of coming to form a justified belief in that content. So, optimism does not take a stand on the dispensability of imaginative justification.

Fourth, optimism is compatible with imaginative justification being both prima facie and pro tanto. Prima facie justification is justification which is defeasible. Pro tanto justification is justification which can be overridden by other countervailing justification. Most empirical justification is both prima facie and pro tanto. For example, memorial justification that p can be defeated if one learns that one's memory is highly unreliable and memorial justification can be overridden if one gains overwhelming evidence that not-p via some other means (such as multiple converging sources of testimony). Similarly, it is plausible that imaginative justification that p can be defeated if one learns that one's imaginings are totally unreliable and can be overridden if one gains overwhelming evidence that not-p via some other means. These caveats do not reduce the theoretical interest of optimism. Prima facie and pro tanto justification is still justification, and it is only natural to expect imaginative justification to be of a piece with other kinds of empirical justification.

Fifth, and finally, optimism is officially silent on the degree of justification that imagination can confer. It is compatible with optimism that the imagination typically

only confers a very low degree of justification. This would still be interesting insofar as many deny that the imagination can confer *any* degree of justification. Nevertheless, I will try to be more ambitious and argue that the imagination can confer a significant degree of justification. More specifically, I will argue that the degree of justification conferred by the imagination can make the difference between belief that is unjustified simpliciter and belief that is justified simpliciter. In other words, imagination can be a justificatory difference-maker. Relatedly, I will argue that the degree of justification conferred by imagination can be enough for a belief to count as knowledge (given that it is also true and meets whatever other conditions are necessary for knowledge). While I would be satisfied if I could establish that the imagination confers any degree of justification, these further theses help to motivate the broader epistemological significance of optimism.

These clarifications are important. Many theorists have built additional assumptions, often implicitly, into their understanding of optimism. For example, some theorists have assumed that imagination must confer immediate justification,[9] or indispensable justification,[10] or particularly strong justification, for optimism to be true.

[9] Egeland 2021 is titled "Imagination Cannot Justify Empirical Belief." But this title is misleading insofar as Egeland seems to concede that imagination can confer mediate justification. Egeland only objects to the claim that the imagination can confer immediate justification.

[10] Levy & Kinberg 2022 argue that "the human imagination is unlikely to be a good source of…knowledge" (p. 15) However, they seem to concede that there are cases in which the imagination produces knowledge. They deny that this causes problems for their view because in these cases the justificatory force of the imagination "is attributable to the proper application of appropriate principles of inference" (p. 12) and thus that the imagination is dispensable and does not constitute a distinctive source of knowledge.

But understanding optimism in these ways does not carve the epistemology of imagination at its joints. We first need to ask whether the imagination can confer justification at all before we can ask about the nature and structure of that justification. As I will understand the view, optimism posits a minimal justificatory role for the imagination. It holds that some imaginings can confer justification, without taking a stand on whether that justification is immediate, whether it is indispensable, whether it is indefeasible, or even whether it is particularly strong. This is the core claim that is needed to motivate the epistemology of imagination as a philosophical project.

To sum up: optimism states that imagination involving mental imagery can propositionally justify beliefs whose contents are contingent propositions about the external world. Or, more succinctly: the imagination can justify empirical belief. This is the thesis I will argue for over the course of the rest of this chapter.

1.3 Arguments for Pessimism

As I said at the beginning of this chapter, up until recently, pessimism was the default, received view. Indeed, many theorists have regarded pessimism as so obvious or self-evident that it does not require argument. However, four main arguments for pessimism have also been advanced in the literature:

1. *The argument from voluntary control*: The imagination cannot justify belief because it is under our voluntary control.

2. *The argument from world-insensitivity:* The imagination cannot justify belief because it is not sensitive to how the world actually is.
3. *The argument from unreliability:* The imagination cannot justify belief because it is unreliable.
4. *The argument from uninformativeness*: The imagination cannot justify belief because it can only recapitulate prior information.

Although these arguments are all closely related to each other, and many defenders of pessimism rely on several of them at once, I think it is useful to carve up the theoretical landscape in this way, as it allows us to distinguish between distinct motivations for accepting pessimism.

Before I begin, let me make a remark about the dialectical situation. One way to be a pessimist about imaginative justification is to be a skeptic about justification in general. If you think we cannot get justification for empirical beliefs by *any* means, then you will also think that the imagination cannot justify empirical beliefs. However, my opponent is not a general skeptic. Most actual defenders of pessimism think that we can get empirical justification through familiar means such as perception, memory, inference, and testimony, and that there is something distinctive about imagination that precludes it from conferring such justification. This is the kind of pessimist that I take to be my primary target.

While this clarification may seem obvious or minor—this is a dissertation on the epistemology of imagination and not on skepticism, after all—it is actually quite significant. As we will see, a recurring theme in my responses to these arguments will be that they overgeneralize beyond imagination to other mental states and processes that both optimists and pessimists agree can justify belief. In particular, I rely heavily on an analogy between imagination and reasoning.[11] Arguments against the justificatory force of the imagination undermine the justificatory force of reasoning in general. This is a conclusion that pessimists about imaginative justification, insofar as they are not general skeptics, will find unpalatable.

1.3.1 The Argument from Voluntary Control

We can frame the *argument from voluntary control* as follows:

1. The imagination is under voluntary control.
2. If a state or process is under voluntary control, then it cannot justify empirical belief.
3. So, the imagination cannot justify empirical belief.

[11] See Myers 2021b for an argument that imagination just is a kind of reasoning. I will not assume this thesis here, but it does bolster the arguments from analogy that follow.

This argument is widely endorsed.[12] Wittgenstein is one of the first to make it explicitly, saying that "it is just because imaging is subject to the will that it does not instruct us about the external world" (1948/1980 p. 15). More recently, White remarks that ""one can't be surprised by the features of what one imagines, since one put them there" (1990 p. 91), and McGinn argues that "I no more learn from images than I learn from the sentences I write down, since in both cases I merely express my antecedent intention" (2004 p. 18).

There are several different senses of voluntary control, and we need to be careful about which one is at issue. A state can be under voluntary control in the sense of being intentionally tokened. I can choose whether to imagine or not. It is something I do, rather than something that happens to me. A state can also be under voluntary control in the sense of having content that is chosen. When I intend to imagine that p, my imagining will follow suit. These two senses of voluntary control can, in principle, come apart. There could be some mental state such that I can choose to token it without being able to choose its content. For example, it is plausible that I can choose to token a new belief even if I cannot choose to believe any content I would like to. It is the second sense of voluntary control that is at issue in the argument from voluntary control. As we will see, it is the

[12] See Balcerak Jackson 2018, Kind 2016, 2018, Langland-Hassan 2016, and Williamson 2016 for articulations and discussions of this argument. While each of their responses target premise 1, my own response targets premise 2.

voluntariness of imaginative content that most plausibly undermines its justificatory force.

The first premise is motivated by first-personal reflection on one's own imaginative projects. Typically, one can choose the content of one's imaginings. I can intend to imagine the taste of mushroom pizza and thereby come to imagine that very content. If I am daydreaming that I am walking down a crowded street on the Lower East Side, I can choose to spice things up by imagining a sudden alien invasion. What I imagine is up to me. I am in control of how my imaginative projects unfold.

The second premise is motivated by the thought that if a state or process is under voluntary control, then it is too unconstrained to be a good guide to what the world is like. In support of this premise, proponents of the argument from voluntary control often appeal to a disanalogy between perception and imagination. While I can choose whether my eyes are open, where they are pointing, and (to an extent) what I am directing my attention towards, I cannot choose the content of my perceptual experience. What I perceive is not up to me. This stands in sharp contrast to imagination. While I cannot choose to *see* a pink unicorn in front of me, I can certainly choose to imagine a pink unicorn in front of me.

The argument from voluntary control will be a recurring issue throughout the dissertation. We will return to versions of it in chapters 3 and 4, and each time we will

further clarify the ways in which the imagination is and is not under voluntary control. I cannot hope to mount a full response here. For now, I simply want to point out some prima facie problems for both premises.

First, with respect to premise 1, it should be noted that not all imaginative projects are voluntary in the relevant sense. Before an important interview, one might be unable to stop imagining themselves flubbing a certain question. Someone with a phobia of rodents might find themselves unable to stop imagining mice scurrying across their kitchen floor. When I have a song stuck in my head, I might find myself unable to imagine anything other than that catchy chorus. All these imaginings are involuntary in the sense of having content that is not chosen. The person with a phobia of rodents doesn't intentionally choose the content of their imagining. Instead, it simply comes to them unbidden. Thus, premise 1 is strictly speaking false. Nevertheless, most central, paradigmatic cases of imagination are voluntary. Even if there are exceptions, I can typically choose what to imagine. So, the argument from voluntary control still has bite.[13]

A more powerful response to the argument from voluntary control targets the second premise. Recall that this premise is motivated by a contrast between perception and imagination. However, consider a different analogy between imagination and

[13] Chapters 3 and 4 both point to more general senses in which the imagination is not under voluntary control and offer more comprehensive objections to premise 1. None of my arguments in this chapter hinge on these later arguments.

reasoning. Reasoning is typically under one's voluntary control. I can choose the subject matter of my reasoning as well as how I carry out my reasoning. For example, I can choose to reason about whether mathematical Platonism is true, or about how long I can put off leaving my apartment before I will be late to class, or about nothing at all. Having selected the former subject matter, I might choose a number of different reasoning strategies. I might choose to think through some of the standard objections to mathematical Platonism see if I find them compelling or to think about whether mathematical Platonism offers any explanatory advantages. Of course, not all reasoning is voluntary. Some reasoning may be carried out automatically and subpersonally. But, as we already noted, the same goes for some imaginings.

One might object that we reason with beliefs, and although we can choose the subject matter of our reasoning, we cannot choose the content of our beliefs. It is true that our beliefs are not under our voluntary control. But it is false that we only reason with beliefs. We also reason with suppositions, guesses, hypotheses, and assumptions. All of these states are plausibly under our voluntary control to various extents. But this does not undermine the justificatory force of reasoning that involves these states.

A different way of maintaining the truth of premise 2 is to hold that reasoning is involuntary in the sense that one cannot simply choose what to conclude on the basis of reasoning. If you have overwhelming evidence that p, in reasoning from that evidence

you cannot simply choose to believe that not-p. This no longer looks like involuntarism about the process that confers justification but rather involuntarism about the belief that is justified on the basis of that process. But the same is true of beliefs formed based on the imagination. Upon imagining that you can safely cross the street in *Jaywalking*, you may find yourself unable to believe otherwise. You can't simply choose to believe that you cannot safely cross the street upon completing your imaginative project. Just as a train of reasoning might lead someone to involuntarily form a belief with a certain content, so too an imaginative project lead might someone to involuntarily form a belief with a certain content.

Reasoning and imagination are on a par with respect to their voluntary control. But it is uncontroversial that reasoning can confer justification. So, the argument from voluntary control must not pick out a feature of the imagination that undermines its ability to justify beliefs.

1.3.2 The Argument from World-Insensitivity

The argument from voluntary control was motivated by the thought that if a process is under voluntary control, then it is not constrained enough to serve as a justifier. Even if this does not follow from the voluntariness of the imagination, one might still worry that the imagination is not sensitive enough to what the world is like to serve as

evidence about what the world is like. This leads us to the *argument from world-insensitivity*, which we can frame as follows:[14]

1. The imagination is not world-sensitive.
2. If a state or process is not world-sensitive, then it cannot justify empirical belief.
3. So, the imagination cannot justify empirical belief.

Once again, a disanalogy to perception is helpful for motivating the argument. Perception tracks the state of one's perceptible environment. What I perceive is systematically constrained by sensory transduction of information that is outside of me and beyond my control. If I perceive a red ball, it is because my visual system is sensitive to an actual red ball in my environment. On the other hand, my imagination is not sensitive to the state of the world. What I imagine is not systematically constrained by how things actually are. I can imagine a red ball even if there are no red balls to be found in my perceptible environment or beyond. Thus, the imagination cannot serve as a guide to the truth.

Indeed, one might think that the first premise is necessarily true. If the imagination were systemically sensitive to the state of one's environment, then it just wouldn't be imagination anymore. It would instead be a form of perception. The imagination is

[14] See Kind 2016, 2018 for articulation and discussion of this argument.

distinguished from other mental states precisely because of its ability to represent alternative possibilities that differ from the actual world.

An obvious and influential response to this argument is that just because the imagination is *sometimes* world-insensitive, does not mean that it is *always* world-insensitive. I can use my imagination to dream up fantasies and fictions that depart drastically from the actual world, but I can also use my imagination to capture how things actually are. The fact that the former use of the imagination lacks justificatory force does not impugn the justificatory force of the latter. You can choose to imagine different ingredients as tasting however you would like. However, you can also try to accurately represent their flavor, as in *Recipe Planning*, and thereby impose a constraint of world-sensitivity on your imaginative activity.

We can distinguish between two different ways that the imagination can be used. *Realistic imaginings* are undertaken with the aim of accurately representing the world while *unrealistic imaginings* are not undertaken with any aim to accurately represent the world.[15] The examples used to support the first premise of the argument from world-insensitivity are all examples of unrealistic imagining. But once we shift our attention to examples of realistic imagining (such as the examples presented at the beginning of this

[15] Kind and Kung 2016 label these "instructive uses" and "transcendent uses" of the imagination, respectively. In previous work, I use the labels "cognitive" and "noncognitive" imaginings (Myers 2021a).

chapter), it is clear that the imagination can be world-sensitive and thus that premise 1 is false, at least with respect to many imaginative projects.

Premise 2 is also subject to objections. Consider another analogy between reasoning and imagination. Suppose you believe that *p* and that *if p then q*, and you reason from these beliefs to a belief that *q*. Is your belief that *q* world-sensitive? Not necessarily; your initial beliefs might be false. Is this any impediment to your belief that *q* being justified? Not at all. It is widely accepted that false beliefs can confer justification when they are themselves justified.

More generally, we can distinguish between processes that are unconditionally world-sensitive and conditionally world-sensitive, analogous to Goldman's (1979) distinction between unconditionally reliable and conditionally reliable processes. Unconditionally world-sensitive processes are ones that are sensitive to the way the world is like in a way that is not mediated by the accuracy of any other representations. Perception is plausibly unconditionally world-sensitive. It is sensitive to the state of world in a way that is unmediated by any other mental states a subject has. By contrast, conditionally world-sensitive processes are processes which are world-sensitive given that the representations which act as their inputs are veridical. For example, modus ponens reasoning is conditionally world-sensitive insofar as it will output true beliefs given true input beliefs. Similarly, semantic memory is conditionally world-sensitive

insofar as it will output true beliefs at a later time given true input beliefs at an earlier time. As a final example, consider computer simulations. Computer simulations will output accurate representations of the world given accurate input parameters. All of these processes are world-sensitive to the extent that you start with true inputs. Start with false inputs, and they will lead you astray. Unconditional world-sensitivity is too strong a condition on justification. Conditionally world-sensitive processes can justify belief.

But once we relax our conception of world-sensitivity to include conditional world-sensitivity, it is no longer plausible that imaginings are not world-sensitive. Realistic imaginings are not directly constrained by the actual state of the world via some process akin to sensory transduction. Instead, they are indirectly constrained by our existing representations of the world. Thus, even if you try to form an accurate imaginative representation, you may fail if you start out with false beliefs. Consider *Mental Rotation* from the beginning of this chapter. If you inform your imaginative project with true beliefs about the shape of the objects, then your imagination can be a reliable source of information about whether the two objects are identical. But, if you inform your imaginative project with false beliefs about the shape of the objects, then your imagination will not be sensitive to whether the two objects are identical. This is exactly analogous to how modus ponens reasoning is only as reliable as the beliefs you start with.

Since conditionally world-sensitive processes can justify belief, and imagination is conditionally world sensitive, the argument from world-insensitivity fails.

1.3.3 The Argument from Unreliability

At this point, one might concede that the imagination can in principle be world-sensitive while holding that it rarely actually is. This thought motivates the *argument from unreliability*:

1. The imagination is unreliable.
2. If a state or process if unreliable, then it cannot confer justification.
3. So, the imagination cannot confer justification.

This argument has much in common with the argument from world-insensitivity. Both arguments hinge on the idea that the imagination does not systematically track the actual state of the world. But while the argument from world-insensitivity is motivated by the thought that the imagination is, by its very nature, disconnected from what the world is like, the argument from unreliability holds that we are just not very good at imagining what the world is like.[16]

Proponents of this argument tend to support premise 1 by pointing to empirical results that suggest that the imagination is subject to biases, misleading heuristics, and

[16] See Maibom 2016, Nanay 2016, and Levy & Kinberg 2022 for discussion of the claim that the imagination is unreliable.

fallacies. These results fall under two main domains: imagining physical systems and imagining affective responses.

One key domain in which the imagination is implicated is in reasoning about physics. Cognitive scientists study our ability to naively reason about physical systems under the heading of "intuitive physics." Many studies have found systematic errors in our intuitive physical reasoning. In one of these studies, subjects incorrectly predict that an object exiting a curved tube will follow a curved trajectory rather than a straight trajectory (McCloskey & Kohl 1983). In another study, subjects incorrectly predict that an object dropped from a moving body will follow a straight path downwards rather than a curved path (McCloskey et al. 1983). Some have suggested on the basis of these studies that our intuitive physics is best modeled on mistaken theories of physics such as an Aristotelian model (DiSessa 1982), or medieval impetus theory (Kozhevnikov and Hegarty 2001). Others have suggested that our intuitive physical reasoning is not best modeled as a single, well-developed theory but rather as an ad hoc and internally inconsistent grab-bag of principles (Cook & Breedin 1994). More recently, it was discovered that intuitive physical reasoning exhibits the conjunction fallacy, in which subjects judge that the probability of two events occurring is more likely than either conjunct on its own (Ludwin-Peery et al. 2020, Bass et al. 2022).

Another key domain in which the imagination is implicated is in reasoning about the affective responses that both ourselves and others will have to different situations. When we imagine our own future emotional reactions, we are subject to "impact bias"—we have a systematic tendency to misestimate both the intensity and duration of our affective responses (Wilson & Gilbert 2005, Ayton et al. 2007). This may be due to several factors, such as an inability to imagine all the peripheral background details that will impact our overall emotional state. We also tend to overestimate similarities between how we feel now and how we will feel in the future situation under consideration. For example, if you are currently hungry or thirsty, then you are likely to project that hunger or thirst into an imagined future scenario (Read and van Leeuwen 1998, Van Boven & Loewenstein 2003). Not only do we tend to overestimate the similarities between our current and future selves, but we also overestimate the similarities between ourselves and others. For example, subjects tend to assume that others share a similar base of knowledge even when they are explicitly told otherwise (Nickerson 1999, Birch & Bloom 2007), and subjects who are themselves hungry and thirsty tend to predict that others will be more bothered by hunger and thirst than subjects who are not hungry or thirsty (Van Boven & Loewenstein 2003). Together, these empirical results motivate the premise that the imagination is systematically unreliable in certain important ways.

I will grant the second premise for the sake of argument, and because full discussion of it would take us too far afield.[17] Instead, I want to argue against the first premise. The imagination may be imperfect and fallible, but it is not unreliable enough to lack justificatory force altogether.

In a review of the limitations and inaccuracies of imaginative perspective-taking, Epley & Caruso write that:

> Making any kind of general statement about the accuracy of perspective taking is about as hopeless as making a general statement on the value of the U.S. dollar— it depends where you look, when you look, and how you measure it. (Epley & Caruso 2008 p. 296)

You could say the same about imagination more broadly. Making any kind of general statement about the reliability of our imaginings is simply hopeless. Too much depends on the domain that is imagined, the context in which the imagining in undertaken, and the skills, abilities, and background knowledge of the imaginative subject. Indeed, for every study that evinces the limitations and biases of the imagination, there is another that evinces its advantages and strengths. In one well-known study, experimenters asked subjects to determine whether a narrow or wide cup would need to be tilted further before water spills out (Schwartz & Black 1999). Subjects who were explicitly instructed to imagine the tilted glasses were more accurate than those who were not. Another study

[17] Although it is worth noting that the second premise is highly controversial and assumes a conception of justification that is at least partially externalist (Cohen 1984).

found that subjects who use their imagination are reliable at predicting whether a tower of blocks will fall or not (Battaglia et al. 2013). Many of the biases and misleading heuristics cited in support of premise 1 are quite dependent on context. For example, errors are reduced when physical reasoning problems are presented in less abstract and more familiar contexts (Kaiser et al. 1986) and with richer, less impoverished stimuli (Kaiser et al. 1992). Within the domain of imaginative perspective-taking, studies find that subjects are more accurate when they can create a more detailed and fleshed-out imaginative representation. For example, subjects are more accurate at predicting the thoughts and feelings of their friends than of strangers (Stinson & Ickes 1992).

Given the current state of the empirical literature, we are simply not in a position to unreservedly pass a verdict that the imagination is unreliable across the board. At best, all we can conclude is that the imagination is fallible. But this is not enough to establish that pessimism about imaginative justification is true. Nearly everyone thinks that our empirical beliefs are fallible. But few, other than the extreme skeptic, would think that the fallibility of our empirical beliefs undermines their justification. Amy Kind makes this point forcefully:

> The fact that perception is fallible doesn't prevent perception from being able to play a justificatory role with respect to beliefs, so why should the fact that imagination is fallible prevent imagination from being able to play this kind of justificatory role? (Kind 2022b p. 46)

To flesh out this line of thought further, consider a different analogy between imagination and reasoning. Reasoning with beliefs is subject to a whole host of biases, misleading heuristics, and fallacies that have been studied under the heading of "cognitive biases and heuristics" (Tversky & Kahneman 1974). This research program has uncovered many ways that everyday reasoning is deeply unreliable. Reasoners regularly fail to take prior probabilities into account ("base-rate fallacy"), mistake the availability of information with its accuracy ("availability heuristic"), and let their reasoning be overly impacted by an initial piece of information ("anchoring bias"). There is considerable debate over whether the prevalence of cognitive biases and heuristics means that human reasoning is "systematically irrational," (Armstrong & Minderman 2018, p. 5607) or whether there is a sense in which cognitive biases and heuristics are rational given our cognitive limitations (Karlan 2020).

Regardless of how this debate turns out, few would hold that the prevalence of cognitive biases and heuristics entails that reasoning *cannot* justify belief. Even those who are most pessimistic about the reliability of actual human reasoning would hold reasoning *can be* and sometimes *is* reliable when it avoids the pitfalls of cognitive biases and heuristics and better approximates ideal rationality. In short: the fact that many people are bad at reasoning does not entail that good reasoning cannot justify belief. Analogously, even if many people are bad at imagining, this does not mean that

imagination cannot justify belief when it is done well. Fallacious imagining doesn't undermine the justificatory force of the imagination in general any more than fallacious reasoning undermines the justificatory force of reasoning in general.

Moreover, the empirical literature suggests that we should be optimistic about our ability to overcome our imaginative shortcomings. Many studies have found that practice can improve the accuracy of imagination in spatial and physical reasoning (Cherney 2008, Cohen & Hegarty 2014, Moen et al. 2020). Similarly, many studies find that training and feedback can improve accuracy in imaginative perspective-taking (Barone et al. 2005, Haut et al. 2019). Moreover, Amy Kind, in a recent series of articles, has argued that imagination (including realistic imagination) is a skill that can be improved with practice (Kind 2020, 2022a, 2022b).

To sum up: the jury is still out on how reliable the imagination is, leaving premise 1 unsupported. But even if the imagination is often unreliable, it can be improved with practice. Thus, the argument from unreliability fails.

1.3.4 The Argument from Uninformativeness

Now, one might hold that, even if the imagination can sometimes be world-sensitive and reliable, we cannot learn anything *new* on the basis of the imagination. The imagination is simply not informative.[18] Sartre famously makes this point when he says

[18] See Kind 2016, 2018 for helpful discussion of this argument.

that "nothing can be learned from an image that is not already known." (1948 p. 12). Egeland, writing much more recently, agrees, saying that imaginings "simply don't provide any new information about the world," and therefore do not "confer any new justification that one didn't already have" (2021 p. 512-3).

These quotations motivate *the argument from uninformativeness*:

1. The imagination is not informative.
2. If a state or process is not informative, then it cannot confer justification.
3. So, the imagination cannot confer justification.

We can motivate this argument with one final disanalogy to perception. To accurately perceive a bowl of fruit in front of you, you need not have any prior information about it. It may be your first time ever encountering this particular bowl of fruit. Nevertheless, perceiving this bowl of fruit can justify all sorts of beliefs about the shape and color of the bowl and the kinds and quantity of the fruit it contains. On the other hand, since imagination does not involve transducing new information via the sense organs, you cannot accurately imagine the very same bowl of fruit without already possessing some information about it. You can only accurately imagine the shape and color of the bowl by relying on your prior knowledge about its shape and color. Similarly, you can only use your imagination to accurately represent how many pieces of fruit it contains if you already have some information about how many pieces of fruit it contains. Thus, while

perception can put one in contact with new information about the world, the imagination can only recapitulate information one already has.[19]

Chapter 3 is entirely dedicated to arguing that premise 1 is false and that the imagination is robustly informative. Here, I will pursue a different, complementary strategy and argue that premise 2 is false. Even if we grant that the imagination is uninformative, it does not follow that pessimism is true.

Whether this argument succeeds or not depends on how we understand the key notion of informativeness. We certainly shouldn't define 'informativeness' as the ability to confer justification, on pain of circularity. Perhaps instead we should understand informativeness as the ability to confer *immediate justification*, justification that does not depend on any prior justification. This explains why Sartre makes the qualification that "nothing can be learned from an image *that is not already known*" (1948 p. 12, emphasis mine), and Egeland makes the qualification that the imagination does not "confer any new justification *that one didn't already have*" (2021 p. 513, emphasis mine). However, on this reading, the argument is invalid. As we discussed above in §1.2.3, justification comes in both immediate and mediate varieties. If premise 1 is identical to the claim that the

[19] As McGinn puts it, "images are not informative, while percepts are," because in perception "I am flooded with information whose causal origin is not me and my intentions but an independent objective world whose properties are being revealed to me" while in imagination the "object of my imaging does not feed new information to me" and therefore only "contains precisely what I intended to bestow upon it" (2004 p. 18-19).

imagination cannot confer immediate justification, then the conclusion that the imagination cannot confer any justification does not follow, because it could be the case that the imagination confers mediate justification.

In the present dialectical context, I think the most charitable reading of the argument from uninformativeness understands 'informativeness' as the property of being able to represent new information that was not already represented by a subject's prior mental states.[20] On this understanding of informativeness, the claim that the imagination is uninformative is the claim that it cannot represent new information that the subject did not already have. This captures the sense in which perception is informative while imagination is not. Perception can accurately represent the world in ways that go beyond one's prior beliefs, while the imagination can only accurately represent the world in ways that are constrained by one's prior beliefs. It also results in an argument that is neither circular nor invalid.

Unfortunately, with this clarification in place, the argument from uninformativeness is now unsound. Premise 2 is false. Many states and processes are capable of conferring justification even though they merely recapitulate information one already has. Consider one final analogy to reasoning. One can reason their way to a conclusion that they already believe and thereby get new justification for believing the

[20] In Chapter 3, we will consider other ways to understand the claim that the imagination is informative.

conclusion. Consider the following example. Suppose that a colleague tells me that the ceiling in the philosophy department is leaking. I form the belief that the ceiling in the philosophy department is leaking, and this belief is justified on the basis of my colleague's testimony. Now suppose that I reflect on what I already believe and recall that I noticed water on the floor the last time I went to the department, and that just a few minutes later, I saw someone bringing a bucket up the stairs. I also recall that later that day, I got an email from the department administrator about maintenance personnel taking care of an issue on the top floor of the philosophy department. I engage in abductive reasoning from these beliefs to the conclusion that there is a leak in the philosophy department. This chain of reasoning is uninformative. It involves reflecting on beliefs that I already have to draw I conclusion that I already believe. It does not involve representing any new information not contained in my prior beliefs. Nevertheless, it is clear that reasoning of this kind can confer justification. My abductive reasoning gives me more justification for believing that there is a leak in the philosophy department ceiling than my friend's testimony alone.

As another example of a process that can justify belief despite plausibly being uninformative, consider memory. Suppose that at t_1 I read that Saturn has seven rings in a reliable encyclopedia and thereby form a justified belief with that content. Now suppose that years later at t_2 I still believe that Saturn has seven rings, but I forgot how I initially

acquired that belief. Even though I forgot my initial justification, it is plausible that my belief at t_2 is still justified. Remembering that Saturn has seven rings preserves my justification for believing it. However, this kind of memory is uninformative.[21] It merely recapitulates a belief that I already had at t_1.

Since both reasoning and memory can justify belief even when they do not generate new information, we can conclude that informativeness is not a condition on justificatory force and that premise 2 of the argument from uninformativeness is false. A state or process can fail to generate new information but still confer justification.

1.4 Arguments for Optimism

So far, I have argued that all the most powerful and influential arguments for pessimism fail. However, showing that arguments for pessimism fail is not yet to argue that optimism is true. While pessimism was the default attitude for many years, more recently several authors have argued that we should be more optimistic about the prospect of imaginative justification.

We can distinguish between four main arguments for optimism that have been defended in the literature:

1. *The Argument from Conditions on Justification:* The imagination meets several widely agreed upon conditions for justificatory force.

[21] It is controversial whether memory can be informative or not. Regardless, I think it is relatively uncontroversial that memory is *sometimes* uninformative.

2. *The Argument from Evolution:* The imagination has been selected to be reliable, and its primary evolutionary function is to yield knowledge.
3. *The Argument from Extraordinary Imaginers:* There are extraordinarily skilled imaginers whose imaginings can confer justification.
4. *The Argument from Computer Simulations:* Computer simulations can justify beliefs, and imaginings are like computer simulations in the relevant ways.

In this section, I will survey and examine these arguments for optimism. I will move through these arguments more quickly than I did the arguments for pessimism in the previous section. My goal is not to offer conclusive objections to these arguments. Indeed, I am broadly sympathetic to each of them. Instead, I merely want to make a prima facie case that each one has dialectical and philosophical shortcomings. This will make space for my own argument for optimism in §1.5.

1.4.1 The Argument from Conditions on Justification

Dorsch (2016) takes a top-down approach to arguing that imaginings can justify beliefs. He first articulates several plausible and widely endorsed conditions on justification, and then argues that beliefs based on the imagination can meet them. The conditions on justification which he considers are reliability, safety, and access. A belief meets the reliability condition if it is produced by a process that tends to produce more true beliefs than false beliefs. A belief meets the safety condition if it would be true in the

closest by possible worlds in which we form the same belief on the basis of the same process. A belief meets the access condition if one is in a position to know that it was formed in a reliable and safe way. The reliability and safety conditions will be attractive to proponents of externalism while the access condition will be more attractive to proponents of internalism.

Dorsch goes on to argue that beliefs based on imaginings can meet these conditions. Dorsch claims that as long as agents use accurate perceptions, memories, and background beliefs to guide their imaginative projects, and they are careful and focused when letting their imaginings unfold, then their imaginings will be reliable. He illustrates this by considering the example of using one's imagination to figure out whether a large table will fit through a doorway. In this case, your imagining will be reliable if you have accurate memories and beliefs about the size and shape of the table and doorway. Beliefs based on the imagination also meet the safety condition because in the closest by possible worlds, one's imagination would still be a guide to the truth, insofar as it is informed by one's evidence. In the table example, as long as the gap between the table and the doorway is wide enough, the belief that the table will fit through the doorway would still be true even in close-by possible worlds in which the table or doorway are slightly larger or smaller. Finally, Dorsch argues, as long as one carries out one's imagining relatively deliberately and is aware of one's track record of imaginative projects, one can be in a

position to know that one's imagination is reliable and safe—that it tends to lead to non-accidentally true beliefs. Since beliefs based on the imagination can meet a number of popular and plausible conditions on justification, Dorsch concludes that imaginings can justify beliefs.[22]

In my view, the argument from conditions on justification has major dialectical shortcomings. First, and most importantly, we have already seen that many opponents of optimism cite extensive empirical evidence in favor of the claim that imagination is unreliable. Although the claim that imagination is reliable is an empirical claim, Dorsch does not reckon with this empirical literature, and opponents of optimism are unlikely to be convinced by Dorsch's bald assertion that we have no reason to doubt that the imagination can be reliable. Second, Dorsch himself notes that the imagination is likely only reliable in limited contexts (when the subject is focused, not tired, the imaginative exercise is relatively simple, and so on). Opponents of optimism, motivated by the empirical literature on this topic, are likely to respond that the contexts in which imagination is reliable are so limited as to be theoretically uninteresting. Third, there are many widely endorsed conditions on epistemic justification that Dorsch does not touch on. This is an understandable limitation, but one that significantly reduces the dialectical force of the argument. For example, Dorsch does not consider how the imagination might

[22] Dorsch also considers further conditions on justification such as aptness (Sosa 2007) and sensitivity (Williamson 2000), although these are not as central to his argument.

meet conditions set forth by views as diverse as phenomenal dogmatism (Huemer 2001), proper functionalism (Bergmann 2006), and various forms of virtue epistemology (Sosa 2007). Proponents of these views, and others that place additional conditions on justification, are therefore likely to remain unconvinced.

The argument from conditions on justification, in addition to its dialectical weaknesses, also has philosophical weaknesses. In particular, it is not clear that we are usually able to meet the access condition. The access condition requires that we have a significant degree of feedback about the accuracy of our past imaginative projects. But many of our imaginative projects are quick, unreflective, and relatively automatic such that we may not store them in long term memory. In addition, many of our imaginative projects are such that we never get any feedback on their accuracy. For example, in a case like *Jaywalking,* you may decide to not cross the street out of an abundance of caution and therefore never learn whether you were actually able to cross safely. Or, in a case like *Recipe Planning,* you may decide not to make kimchi, artichoke, and peanut butter stew, and therefore never confirm whether it actually tastes good.

In addition, it is not clear how to generalize from the reliability and safety of past imaginings to the reliability of future ones. This is because imaginative reliability may be highly sensitive to the domain that is imagined. For example, one might be good at using one's imagination for spatial reasoning but poor at using one's imagination to reason

about how certain dishes will taste. Or, one might be good at imagining physical systems but bad at imagining the perspectives of others. This makes it very difficult to infer from a stellar track record in one domain to the reliability of an imaginative project about a different domain. And since we are not in a position to know what sorts of small differences in imaginative projects might make a big difference in their reliability or safety, we are not always in a position to know that any given imaginative project is reliable and safe.

1.4.2 The Argument from Evolution

Williamson (2016) argues that a function of the imagination is to raise and evaluate practically relevant possibilities. He considers how the imagination might have been useful for a group of our distant evolutionary ancestors:

> "They are about to enter a forest. They imagine wolves in the forest; warned of the danger, they keep a sharper look-out for signs of wolves. They imagine edible berries in the forest; alerted to the potential opportunity, they look about for bushes of the right kind" (Williamson 2016, p. 114).

This suggests that the imagination confers an evolutionary advantage. It is useful for securing survival and reproduction. But, Williamson notes, it could only serve this purpose if it were generally "selective and reality-oriented." The imagination is selective in that it tends to represent scenarios that are practically relevant, and it is reality-oriented in that it is reliable and sensitive to facts about the world. After all, Williamson argues,

"an imagination that clutters up the mind with a bewildering plethora of wildly unlikely scenarios is almost as bad as no imagination at all. It is better to have an imagination that concentrates on fewer and more likely scenarios" (2016, p. 114).

Given this evolutionary pressure for imagination to be selective and reality-oriented, Williamson argues that it can be used not only to raise salient possibilities, but also to evaluate the truth of certain propositions. He gives the example of a hunter trying to figure out whether he is able to jump across a stream. Since trying and failing would be costly, Williamson argues that the best way for the hunter to approach this problem is to imagine jumping across. If they imagine themselves succeeding, this will justify a belief that if they jumped, then they would clear the other side. The ability to use one's imagination in this way would clearly be evolutionarily advantageous. Since there are reasons to think that the imagination evolved to be reality-oriented, and thus reliable, we should allow that imaginings can justify beliefs.

While Williamson's evolutionary story strikes me as plausible, it is simply too speculative to be given much weight. Evolutionary theorists disagree about the selection pressures that gave rise to the human imagination. Some hypotheses that have been floated include that the imagination evolved because of its ability to facilitate social interaction and communication (Ginsburg & Jablonka 2014, Asma 2017), tool and artifact design (Fuentes 2020), and religious behavior (Montell 2002). Other theorists deny that

there was any single primary selection pressure that led to the development of the human imagination but instead hold that the imagination is a collection of adaptations corresponding to selection pressures for spatial navigation, decision making, design, social cognition, language and narrative, anticipating future events, and so on (Mithen 2001, Suddendorf & Dong 2013). Given the state of this disagreement, and the speculative nature of many of these hypotheses, we are simply not in a position to put too much credence in any one evolutionary hypothesis.

Furthermore, there are well-known problems with any inference from the fact that a cognitive process confers an evolutionary advantage to the conclusion that it is reliable. In principle, it can be evolutionary advantageous to have beliefs which are systematically false but produce fitness-enhancing actions. This possibility is salient in the context of our imagination. As we discussed above, there is empirical evidence that our imaginings of physical systems may closely approximate the actual world but operate based on false physical principles and thus be systematically misleading in certain ways. In the context of imaginative perspective-taking, there may have been evolutionary pressures to infer the mental states of others in ways that promote social cohesion and cooperation, even if they have no basis in reality. Finally, as is suggested by the wealth of hypotheses surveyed in the previous paragraph, and as Levy & Kinsberg 2022 point out, it seems likely that the imagination was subject to many different evolutionary pressures that may

pull in conflicting directions, yielding a system that is optimal in multidimensional fitness space, but that is far from optimal along any single dimension of fitness, such as reliability.

1.4.3 The Argument from Extraordinary Imaginers

Kind (2016, 2018) gives two arguments for optimism. Her first argument, the argument from extraordinary imaginers, proceeds in two steps. First, people who are extraordinarily skilled imaginers can use their imaginings to justify beliefs. Second, imaginers can approximate the ideal embodied by the extraordinary imaginers.

As examples of extraordinarily skilled imaginers, Kind relies on the case studies of Nikola Tesla and Temple Grandin. Both Tesla and Grandin are especially skilled at generating rich, stable, and vivid mental imagery, and both used this skill to help them plan and test their inventions. Kind quotes Tesla as saying that "the whole idea is worked out mentally. In my mind, I change the construction, make improvements, and even operate the device" (Tesla 1921 p. 62, quoted in Kind 2016). According to Tesla, this method of invention was entirely reliable; all of the machines that he invented in this way operated the way they were supposed to. Similarly, Temple Grandin made huge advances in the design of live-stock handling devices by relying on her imagination. Kind quotes Grandin describing her process: "I started running three-dimensional visual simulations in my imagination. I experimented with different entrance designs and made

the cattle walk through them in my imagination. These images merged to form the final design" (Grandin 1995, p. 19-23, quoted in Kind 2016). Both Tesla and Grandin formed beliefs on the basis of their imaginings. And, Kind contends, these beliefs are clearly justified. Tesla's imaginings gave him reason to believe that his designs would work, and Grandin's imaginings gave her reason to believe that her designs would be more effective than currently existing designs.

Although most people are not as skilled at carrying out imaginative projects as Tesla and Grandin, Kind holds that ordinary imaginers can approximate their ideal. In the same way that Tesla and Grandin were able veridically represent complex designs in their imagination, ordinary imaginers can constrain their imaginings to be sensitive to features of reality and thus to be reliable sources of belief. This may require more effort on the part of ordinary imaginers than it does for Tesla or Grandin, and it may not always achieve Tesla or Grandin's level of reliability, but when it is constrained properly the imagination is capable of being a reliable source of information about the world.

Once again, I am sympathetic to this line of argument. But the pessimist about imaginative justification has ways of resisting both premises. First, one could simply deny that Tesla and Grandin's imaginings give them justification.[23] After all, this is

[23] Levy & Kinberg 2022 pursue this line of objection in a different way than I do here. They argue on the basis of textual evidence from Tesla's autobiography that Tesla's imaginative projects were not in fact very reliable. While this is perhaps interesting in its own right, in my view it does not undermine Kind's argument. Kind could just as well have appealed to Grandin alone. Indeed, Kind's argument could

precisely what pessimists are committed to. Indeed, this premise begs the question against the pessimist by assuming the very thing it is trying to prove. A pessimist who holds that imaginings cannot justify belief will not be willing to grant the premise that Tesla and Grandin's imaginings can. Second, one could deny that ordinary imaginers are relevantly analogous to extraordinary imaginers. Tesla and Grandin's imaginings are unusually stable, vivid, and reliable. It is not clear that most ordinary imaginers are able to approximate this ideal. Indeed, many pessimists, relying on the empirical evidence cited in §1.3.3, explicitly argue that ordinary imaginers are not able to approximate this ideal, and will therefore be unwilling to grant this premise without further argument.

1.4.4 The Argument from Computer Simulations

Kind (2018) gives a further argument for optimism that we can call the argument from computer simulations. Kind argues that computer simulations can justify beliefs. As evidence, she cites the fact that computer simulations are widely relied upon in the sciences to evaluate hypotheses and generate understanding of the simulated phenomena. She then argues that imaginative simulations are relevantly like computer simulations. In both cases, one runs a simulation in order to evaluate whether some hypothesis is true. Kind points out that it is not epistemically relevant whether the

plausibly be motivated simply by appealing to hypothetical ideal imaginers, rather than any actual imaginers.

simulation is carried out on an external device or within our minds. Thus, she concludes, imaginings can justify beliefs.

Like the argument from extraordinary imaginers, one can resist the argument from computer simulations in two ways: either by denying that computer simulations can justify beliefs or by denying that imaginative simulations are relevantly analogous. The former option seems less plausible in this case. The claim that computer simulations can justify beliefs does not beg the question against the imaginative pessimist, is highly intuitive, and accords well with scientific practice. Instead, the pessimist is likely to deny that typical imaginative simulations are relevantly analogous to computer simulations of the kind used in scientific practice. Indeed, the pessimist is likely to deny this premise for the same reason that they will deny that ordinary imaginers can approximate ideal imaginers: it is plausible that ordinary agents are simply too unreliable. The principles that govern how computer simulations unfold will be informed by our best scientific practice, while the mechanisms that govern how imaginative simulations unfold may be highly ad hoc and unreliable. Computer simulations are also becoming increasingly powerful, while the human imagination may be subject to fairly strict computational limitations. For example, human working memory capacity is limited to about four objects at a time, while computer simulations face no such limitation (Cowan 2010). Finally, as I already noted above, the human imagination is subject to many heuristics

and fallacies that will simply not be present in computer simulations. For all these reasons, the pessimist may reasonably conclude that the human imagination is importantly disanalogous to computer simulations of the kind used in science.[24]

1.5 The Argument from Skeptical Consequences

While each of the preceding arguments for optimism about imaginative justification contains important insights, we have also seen that they are subject to plausible objections and worrying limitations. No doubt, more would have to be said to develop these objections in detail and consider all the ways that the proponent of each argument could respond. Nevertheless, these objections make a prima facie case against extant arguments for optimism and open up theoretical space to advance a new, more decisive argument that imagination can justify belief. This is the task of the current section.

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[24] Levy & Kinberg 2022 advance a different objection to the argument from computer simulation. They argue that computer simulations are a form of inference, and that if "the imagination functions to execute principles of inference that we have independent reasons to accept," then it is not a "novel form of knowledge production" (p. 12). As I read them, Levy and Kinberg end up conceding that optimism may be true. They hold that if imaginings are analogous to computer simulations, then they may be able to justify belief on the basis of proper application of principles of inference. This is tantamount to holding that the imagination can justify belief. They resist this conclusion by arguing that "it is the quality of these inferences, and not the imaginary setup, that justifies us in believing their output" (p. 11-12). But if imagination just *is* inference, then it is not clear how we could draw this principled distinction between their epistemic contributions. They may be suggesting, to use terminology from earlier, that if imagination is analogous to computer simulation, then it is dispensable; one could always arrive at the same conclusion using non-imaginative inference. But, as I already argued, the question of whether imagination can justify belief should be divorced from the question of whether imagination is indispensable in the justification of those beliefs.

I suspect that much of the resistance to the possibility that imaginings can justify beliefs stems from the implicit assumption that we rarely use our imagination in deliberation. If epistemic uses of the imagination are some niche phenomena, it is not very costly to deny their epistemic significance. However, once one appreciates the extent to which the imagination is implicated in our day-to-day reasoning, it becomes clear that the denial of imaginative justification commits one to an unattractive skeptical conclusion.

We can frame the *argument from skeptical consequences* as follows:

1. Many broad domains of belief are based on the imagination.
2. If optimism is false and many broad domains of belief are based on the imagination, then many broad domains of belief are systematically unjustified.
3. Many broad domains of belief are not systematically unjustified.
4. So, optimism is true.

Premise 1 states that imagination plays large role in our everyday belief formation, premise 2 infers from this that if imaginings cannot justify belief, then skeptical consequences follow, and premise 3 denies that these skeptical consequences obtain.

Perhaps the most convincing motivation one can give for the claim that the imagination plays an important role in our everyday reasoning is the wealth of examples with which this chapter began. *Jaywalking*, *Busy Day*, *Mental Rotation*, and *Recipe Planning*

are a small representative sample of the myriad ways in which people use their imagination to deliberate about what to believe. Pessimism commits one to some counterintuitive verdicts about these cases. It would be awfully strange to criticize someone for engaging in mental rotation or imaginative perspective-taking. To the extent that epistemic uses of the imagination such as these are common, pessimism is committed to the claim that many of our everyday beliefs are unjustified.

Fortunately, I do not need to rest my case on the mere intuition that relevantly similar cases are sufficiently common. There is also overwhelming empirical evidence that imagination is implicated in many general domains of belief-formation. In particular, imagination is implicated in the domains of spatial reasoning, physical reasoning, and reasoning about other minds. These are among the domains of belief that are alluded to in premise 1.[25]

First, the imagination is deeply implicated in spatial reasoning. The *locus classicus* is a study by Shepard & Metzler (1971) that presented subjects with two figures at different angles of rotation from each other and asked them to determine whether or not they are identical. They found that response time correlates with the angle of rotation.

[25] I do not claim that these domains *exhaust* the domains of belief that the imagination is implicated in. Indeed, I think it is plausible that there are others. For example, in *Recipe Planning* one reasons about what a certain dish would taste like. This is not obviously a kind of spatial reasoning, physical reasoning, or reasoning about other minds. Instead, it is reasoning about what certain experiences would be like. While I think that it is very plausible that we often reason about experiences using our imagination, I will not discuss it further due to a lack of empirical work on this subject.

This finding is taken to support the idea that subjects are using their imagination to arrive at a conclusion; they mentally rotate one object to match the orientation of the other and then compare their imaginative representations to determine whether they are identical. Another classic study comes from Finke & Pinker (1982). They presented subjects with an array of dots, which disappear before an arrow is displayed. The task is to figure out whether the arrow is pointing at the location of one of the previously displayed dots. Experimenters found that response time correlates with the distance between the arrow and the target dot, indicating that subjects are completing the task by imagining the array of dots and then 'mentally scanning' the distance between the arrow and the target dot. This imaginative mental scanning process takes more time the farther away the dot and arrow are from each other, thereby explaining the central finding. Many follow-up studies have confirmed and extended these results to implicate imagination across many spatial reasoning tasks (see Kosslyn, Thompson, & Ganis 2006 for a review). One such study found that ease of creating an imaginative model, rather than ease of logical inference, predicted spatial reasoning performance (Byrne & Johnson-Laird 1989).

Second, the imagination is deeply implicated in physical reasoning, which involves not just reasoning about spatial structure, but about how physical systems evolve over time. Many studies find that generating imagery selectively interferes with mechanical reasoning while verbal memory tasks do not, and that mechanical reasoning

ability correlates with ability to generate mental images (Hegarty & Sims 1994, Sims & Hegarty 1997, for a review see Hegarty 2004). There is evidence that models of mechanical reasoning based on imaginative mental simulation outperform rival models in matching human performance (Battaglia, Hamrick, & Tenenbaum 2013, Hamrick et al. 2016, Hamrick 2019). Studies find that action planning performance correlates with skill in producing motor imagery, and that motor imagery is implicated in physical reasoning over and above visual imagery (Shwartz & Black 1999, Toussaint et al. 2013).

To be fair, there are individual differences in the extent to which subjects use their imagination to engage in spatial and physical reasoning. But there is evidence that these differences correlate with mental imagery ability, suggesting that imaginative reasoning is the default, only to be supplemented with different strategies when imaginative skill is sufficiently low (MacLeod et al. 1978, Reichle et al. 2000). Other individual differences in spatial and physical reasoning tasks are differences in *how* the subjects use their imagination, such as whether they imagine an external object undergoing a spatial transformation or imagine themselves taking a different egocentric viewpoint on the scene, and not differences in whether they use their imagination at all (Hegarty & Waller 2004). Studies utilizing self-report methodology typically find that mental imagery is deeply implicated in physical reasoning despite some individual variation (Barratt 1953, Clement 1994).

Third, there is also extensive evidence that imagination is implicated in reasoning about other minds. Subjects who have emotional deficits are also impaired at recognizing emotions in others. For example, some subjects with damage to their amygdala are both unable to experience fear and have difficulty identifying fear in others (Adolphs et al. 1994, Sprengelmeyer et al. 1999). Broadly similar findings are found for subjects with an inability to experience disgust (Calder et al. 2000). Interestingly, when normal subjects are given a drug to impair their anger response, they also fare poorly at recognizing angry facial expressions (Lawrence et al. 2002). These findings support the idea that subjects recognize and reason about others' emotions by imaginatively taking their perspective. If one is unable to experience a certain emotion, then they will be unable to imagine what that emotion feels like, and thus be unable to imaginatively take the perspective of someone who is feeling that emotion. If reasoning about other's emotions were just a matter of inferring on the basis of one's beliefs about that person, then emotional impairments should not disrupt one's reasoning. This interpretation is bolstered by several studies which find that observing someone who expresses disgust triggers activity in neural areas responsible for the feeling of disgust (Phillips et al. 1997, Wicker et al. 2003) and that viewing someone in pain triggers activity in neural areas responsible for the feeling of pain (Singer et al. 2004, Jackson et al. 2005). Relatedly, a number of studies demonstrate that watching another person perform an action triggers

corresponding motor imagery in the observer (Jeannerod 2001, Vogt et al. 2013). Together, these studies suggest that we understand the minds of others by imagining what it is like to be them.

Another study asked subjects to observe someone and list out their thoughts (Davies et al. 2004). In different conditions, subjects were given different instructions. Some were explicitly instructed to imagine the target's perspective, while others were instructed to take a neutral perspective and merely observe their behavior. Crucially, the study found that subjects that are left to their own devices and given no explicit instructions at all produce responses that are most similar to those of subjects who are explicitly instructed to imagine the perspective of another, suggesting that imaginative perspective-taking is the default strategy in reasoning about other minds.

The debate over whether our understanding of other minds involves imagination or not has traditionally gone under the heading of the debate between simulation theory and theory theory, with simulation theorists arguing that imagination plays a crucial role and theory theorists arguing that non-imaginative inference plays a crucial role. It is notable that the contemporary debate has moved beyond whether imagination plays a role or not. Instead, most theorists accept some hybrid theory that affords both imaginative and non-imaginative processes some role (e.g. Goldman 2006, Deonna & Nanay 2014, Roelofs 2017). Thus, there are few who deny that imagination plays a crucial

(if non-exhaustive) role in reasoning about other minds.

To sum up: there is extensive empirical evidence that imagination is heavily relied upon in reasoning about space, physics, and other minds. Indeed, Moulton and Kosslyn (2009), in an insightful review, hypothesize that simulation, both of physical systems and of other minds, is the primary function of the imagination. This empirical evidence, coupled with reflection on everyday cases like *Jaywalking*, *Busy Day*, *Mental Rotation*, and *Recipe Planning*, supports the first premise of the argument from skeptical consequences; the imagination is deeply implicated in many broad domains of belief-formation.

The second premise of the argument from skeptical consequences states that if optimism is false and premise 1 is true, then many broad domains of belief are systematically unjustified. This premise follows from our definition of optimism. The upshot of our discussion of premise 1 is that many of our beliefs—beliefs about spatial structure, beliefs about how physical systems evolve over time, beliefs about the minds of other people—are formed on the basis of the imagination. But if imagination cannot justify belief, then these beliefs are systematically unjustified. I say that they are *systematically* unjustified because everyone agrees that humans sometimes, or perhaps even often, form unjustified beliefs. But if optimism is false, then imaginings cannot as a matter of principle justify belief, meaning that domains of belief that are based on

imagination are not just sometimes or often unjustified, but are entirely unjustified across the board.

Premise 1 and premise 2 together entail that the pessimist about imaginative justification is committed to a skeptical conclusion. If the pessimist is correct, then many broad domains of belief are unjustified. Premise 3 amounts to a denial of this skeptical conclusion. Recall, most defenders of pessimism about imaginative justification are not wholesale skeptics. They think that our ordinary empirical beliefs are by-and-large justified—they just deny that imagination contributes to this justification. So, most actual defenders of pessimism are committed to premise 3. They have failed to anticipate the skeptical consequences of their own view.

Not only is premise 3 granted by my opponents, but it is also independently plausible. While humans are fallible, and it is certainly true that people occasionally or even often form unjustified beliefs in the process of reasoning about spatial structure, physical systems, or other minds, it is implausible that these beliefs are systematically unjustified. We seem to do good enough at spatial reasoning, physical reasoning, and reasoning about other minds to get by. At the very least, we do not seem to be in a situation where we are systematically getting it wrong.

Moreover, from a purely methodological perspective, the fact that reliance on the imagination is so widespread gives us reason to try to make sense of how it could be

rational, rather than to pronounce it irrational from the armchair. It is, or should be, a constraint on epistemological theorizing that we try to make sense of and do justice to our actual epistemic practices rather than impute massive, systematic irrationality to people. Analogously, if a view of perceptual justification were to entail that all perceptual beliefs are systematically unjustified, then this would be a reason to reject that view. Why? Presumably, at least in part, because perceptual beliefs account for a significant portion of our beliefs. Given the scope and importance of perceptual beliefs to our cognitive lives, the epistemology of perception rightly takes as its starting point that perceptual beliefs are by and large justified and seeks to explain how they come to attain that epistemic status.

Similarly, the epistemology of imagination should take as its starting point that beliefs based on the imagination are justified and instead inquire into how they come to acquire that status. This starting point is defeasible. If there are especially good arguments against the view that imaginings can justify beliefs, then they may very well override this intuitive starting point. But, the theorists quoted at the very beginning of this chapter who simply assume that the imagination cannot justify beliefs have the dialectic all wrong. The intuitive, default position, only to be overturned by decisive evidence, is that the imagination can justify beliefs. And, as we saw in section 3, there

simply are not any decisive arguments that overturn this conclusion. Extant arguments for pessimism all fail. Therefore, I conclude that the imagination can justify belief.

One might object to premise 2 in the following way: denying optimism only leads to a skeptical conclusion if imagination is the *only* way to form beliefs about the relevant domains. If there are other ways to form justified beliefs about those domains, then one can deny optimism while holding that those domains of belief are justified by some other means. Moreover, it seems like there are other ways to form justified beliefs about the relevant domains. One can form beliefs about the spatial and physical world simply by perceiving it, rather than imagining it. For example, you can form the belief that two objects are identical simply by looking at them very closely rather than imaginatively rotating them. And one can form beliefs about other minds by engaging in inference, rather than imagination. For example, I might conclude that my partner is exhausted simply by inferring it from what I know, rather than imaginatively taking her perspective. In this way, one can deny that pessimism leads to skeptical consequences.

There is an important grain of truth in this objection. Although the empirical evidence suggests that we *often* use our imagination to engage in spatial and physical reasoning and reasoning about other minds, it is doubtful that we *always* use imagination to do so. Many studies suggest that there is great variation both within and between individuals in what reasoning strategies they employ, and that there are often multiple

routes—some imaginative and some not—to the same conclusion (Glushko & Cooper 1978, Riechle et al. 2000, Zeman et al. 2010, Nishimura et al. 2021).

My response is two-pronged. First, a skeptical conclusion still follows from pessimism even if imagination is dispensable. The justificatory status of a belief depends on whether it is based on adequate propositional justification. If a belief is based on a state that does not confer propositional justification, then the belief is doxastically unjustified even if there are other belief-forming methods available that *would* justify the belief *if* it were based on them. As long as most people in fact use their imagination to form beliefs about the relevant domains, then pessimism is committed to the claim that their beliefs about these domains are in fact systematically unjustified. This skeptical conclusion is tempered by the fact that there are ways of improving our epistemic position. But it is a skeptical conclusion nonetheless.

Second, even if the imagination is dispensable in principle, it will often be *practically* indispensable. Consider *Jaywalking*. Of course, one way to figure out whether you can safely cross the street before incoming traffic is to simply walk across the street and see what happens. But given the potential costs, this method may simply be too risky to be a live option for you. Or, consider *Recipe Planning.* One way to figure out whether the ingredients will go well together is to actually cook the dish and taste it. But with limited time and resources, it may not be feasible for you to go through the effort of

making the dish when you are not sure that it will pay off. More generally, the imagination is a relatively low effort way to simulate scenarios that would be too costly to investigate by any other means. Thus, even if there are multiple routes to the same belief, it may be that imagination is often the only practically feasible option.

A different way for the pessimist to object would be to deny premise three and accept the skeptical consequences of their view. They might attempt to make this maneuver more palatable by minimizing these implications. After all, the skeptical conclusion they are committed to a local one. Pessimism is not committed to the claim that *all* our beliefs are unjustified, only that many of our beliefs in certain domains are unjustified. Since this does not have the wide-ranging consequences of global skepticism, the pessimist may be willing to bite the bullet.

Once again, there is an important grain of truth in this objection. I certainly don't want to suggest that denying the justificatory force of the imagination entails global skepticism. However, although the skeptical implications of pessimism are local, they are still both sizeable and significant. They are sizeable insofar as reasoning about spatial structure, physical systems, and other minds accounts for a good deal of our reasoning. And they are significant insofar as they target beliefs that are practically important, given our interests and concerns. We are beings that need to navigate space, make predictions about the physical world, and interact with other people in order to meet our needs and

achieve our goals. So, denying premise 3 does not amount to denying the justificatory status of a few highly peripheral beliefs, but of many of our most central and practically important beliefs. Moreover, this is likely to have knock-on effects, since these beliefs are likely to form the basis for further reasoning. For these reasons, I do not think that merely appealing to the locality of these skeptical conclusions is enough to make biting the bullet palatable. A skeptical conclusion can be local while still being sizeable and significant, and it is these further factors that give us reason to reject it.

In sum, defenders of pessimism have tended to assume that forming beliefs on the basis of the imagination is a niche and rarefied phenomena. But first-personal reflection on our own mental lives coupled with a wide array of empirical evidence from the cognitive sciences suggests otherwise. As a result, pessimism is committed to far-reaching skeptical implications that are both philosophically unattractive and dialectically unacceptable. Therefore, we should embrace optimism about imaginative justification.

1.6 Conclusion: Towards an Epistemology of Imagination

In this chapter, I surveyed the extant literature on the epistemology of imagination and argued that we should be optimistic about the prospect of imaginative empirical justification.

I began by reviewing and objecting to extant arguments for pessimism: the view that the imagination is incapable of justifying empirical beliefs. Each of these arguments proceeds by way of locating some necessary condition on a state or process having justificatory force (involuntariness, world-sensitivity, reliability, informativeness), and arguing that the imagination does not meet it. The common thread behind my objections to these arguments is that they overgeneralize and undermine the justificatory force not just of the imagination, but of reasoning in general.

I then reviewed the most direct and explicit arguments for optimism that have been proposed in the literature.[26] Although I am broadly sympathetic to each of these arguments, and I think they each contain important insights, they also each have important philosophical and dialectical shortcomings. They either rely on speculative empirical claims (e.g. about the evolutionary function or general reliability of the imagination), tenuous analogies (e.g. between extraordinary imaginers and ordinary ones or between computer simulations and imaginings), or tendentious assumptions about the nature of epistemic justification (e.g. that reliability, safety, and access are sufficient for it).

[26] This does not cover all the arguments that have been proposed in the literature. Many arguments for optimism are not fully explicit but are instead implicit in specific proposals about the cognitive architecture of the imagination (see, for example, Langland-Hassan 2016, Williams 2021) or the epistemic structure of the imagination (see, for example, Kind 2016, Badura 2021, Myers 2021a, 2021b).

I used the dialectical shortcomings of these existing arguments to motivate a new argument for optimism about imaginative justification: the argument from skeptical consequences. The argument proceeded in two steps. First, there is overwhelming empirical evidence that humans use their imagination to form beliefs in a number of important and wide-ranging domains, including beliefs about space, about physics, and about other minds. Second, pessimism about imaginative justification would lead to skepticism about those domains. To avoid this skeptical conclusion, optimism should be our default starting point. Humans may be fallible when it comes to reasoning about space, physical systems, and other minds. But we should not, from the armchair, conclude that they are deeply and systematically irrational when it comes to these domains.

The conclusion that the imagination can justify empirical belief sets the stage for the rest of the dissertation, which will investigate the nature and structure of imaginative justification. One way of viewing this project is as a constructive defense of optimism about imaginative justification: an account of *how* the imagination justifies belief that demonstrates *why* it is epistemically relevant in the first place.

Chapter 2

The Structure of Imaginative Justification

2.1 Introduction

Epistemic justification is often conceptualized as forming a structure, with some justification forming the foundation upon which other justification rests. Where does imaginative justification fit into this structure? In other words, how does imaginative justification relate to and depend on other justification? There are two broad answers to this question that can be found in the literature. According to the first, imaginings are a foundational source of justification. On this view, imaginings confer immediate justification: justification that does not depend on any other justification. We can call this the *immediate justification view*. According to the second, imaginings justify belief only in tandem with a separate inference from one's prior beliefs, which themselves require justification. On this view, imaginings confer inferential justification: justification that results from basing a belief on other antecedently justified beliefs. We can call this the *inferential justification view*.[27]

[27] This division between immediate and inferential justification views of imaginative justification mirrors the theoretical landscape of other domains of epistemology. Similar divisions between immediate and inferential views appear in the literatures on perceptual justification (Bonjour 1985, Pryor 2000), testimonial justification (Fricker 2003), and memorial justification (Huemer 1999).

The goals of this chapter are threefold. First, I want to map out the motivations for both views, develop what I take to be the most promising versions of each view, and locate extant theories of imaginative justification within this landscape. Second, I want to argue that both the immediate justification view and the inferential justification view are false. Imaginings do not generate justification on their own nor do they only justify in tandem with an inference. Third, I want to use the failure of the immediate and inferential justification views to motivate a new view of the structure of imaginative justification. On this view, imaginative justification is mediate but non-inferential. Imaginings confer justification in a way that depends on one's prior justification but without involving an inference from one's prior beliefs. This *mediate justification view* provides a promising way forward for theorizing about imaginative justification.

The chapter proceeds as follows. Section 2 introduces and develops the immediate justification view. Section 3 objects to the immediate justification view. Section 4 considers two different ways of fleshing out the inferential justification view and argues that both fail. Section 5 uses the arguments of the previous sections to motivate the mediate justification view.

2.2 The Immediate Justification View

Immediate justification is justification that does not depend on any other prior justification. For example, it is plausible that my experience of having a headache

immediately justifies my belief that I am in pain. I do not need to have any other prior evidence for my headache to justify this belief. Immediate justification stands in contrast to *mediate justification,* which is justification that depends, at least in part, on prior justification. For example, it is plausible that modus ponens inference confers mediate justification. Inferring that *q* from my beliefs that *p* and *if p then q* is only justified if those prior beliefs are themselves justified. Immediately justified beliefs form the foundation on which mediately justified beliefs are built.

According to the *immediate justification view*, the imagination confers immediate justification. On this view, the imagination is part of the foundation of our justified beliefs, conferring justification that does not presuppose any prior justification. Before proceeding, let me make a few clarificatory remarks. First, the immediate justification view is not committed to the claim that all imaginings have justificatory force. It might be that only some imaginings provide immediate justification, in virtue of meeting some further conditions (so long as those conditions do not require the subject to have prior justification). Second, the immediate justification view is a view about prima facie justification, rather than all-things-considered justification. Thus, one might have a belief which is prima facie immediately justified on the basis of an imagining, but which is all things considered unjustified since one possesses defeaters for that belief. Third, the immediate justification view, contrary to some classical accounts of immediate

justification, is not committed to the claim that imaginative justification is infallible or even particularly strong. That being said, most proponents of this view will want to claim that imaginative justification is, when all goes well, sufficient for knowledge.

Why might one think that the imagination can confer immediate justification? One important motivation comes from an analogy between imagination and perception. Consider the following pair of cases:

> *External Jigsaw Puzzle*: You are assembling a jigsaw puzzle. You are just about done and only have a few pieces which are missing. You select a piece and try to place it into one of the open spaces, rotating it until it fits snugly. You form the belief that the piece fits into the open space.

> *Mental Jigsaw Puzzle*: You are assembling a jigsaw puzzle. You are just about done and only have a few pieces which are missing. You select a piece and imagine trying to place it into one of the open spaces. You imagine rotating it until you imagine it fitting snugly. You form the belief that the piece fits into the open space.

In *External Jigsaw Puzzle* your belief is justified on the basis of perception. You can just *see* that the piece fits into the open space, and your belief is justified on the basis of this perceptual experience. It is an increasingly popular view that perception can

immediately justify beliefs.[28] If you perceive that a puzzle piece fits into an open space, this makes it prima facie appropriate to believe that the puzzle piece fits, independently of any other justification you have.

Notably, *Mental Jigsaw Puzzle* is closely analogous to *External Jigsaw Puzzle.* Both represent the puzzle piece fitting into the open space, and both involve a distinctively visual phenomenology of various shapes and colors.[29] The similarity between these two cases can make it seem plausible that it doesn't matter much whether you actually fit the piece into the space or merely imagine fitting the piece into the space. Both cases involve "seeing" that the piece fits, and this "seeing" is sufficient for justification, regardless of whether it is with your actual eyes or merely with your "mind's eye." If *External Jigsaw Puzzle* involves immediate justification, and *Mental Jigsaw Puzzle* is relevantly similar to *External Jigsaw Puzzle*, then we should conclude that *Mental Jigsaw Puzzle* involves immediate justification as well.

I suspect that this analogy with perception lies behind many theorists' endorsement of the immediate justification view. For example, Madeleine Hyde states

[28] See, for example, Pryor 2000, 2005, Huemer 2007, and Goldman 2006.

[29] Of course, the similarity should not be overstated. While both perception and imagination share a similar sensory core, there are also clear differences. Intuitively, their phenomenology differs in intensity or vivacity. Kriegel 2015 goes further and argues that there is a categorical difference in phenomenology. Similarly, some accounts of imaginative content deliver the verdict that imaginative content differs in kind from perceptual content (e.g. Kung 2010). Nevertheless, regardless of what the correct account of imaginative phenomenology and content is, I suspect the pre-theoretic intuition that there is a shared sensory core is in fact what motivates many towards the immediate justification view.

that "the imagination can be put to good epistemic use, justifying certain beliefs based on its content in a way comparable with perceptual experience" (2019, p. 32). Similarly, Amy Kind argues that "perceiving a state of affairs S justifies (or contributes to the justification of) the belief that *P* [and] in at least some cases, imagining a state of affairs *S* can have the same justificatory power." (2018 p. 228).

The immediate justification view of imaginative justification can be developed within either an externalist or internalist framework. Most extant versions of the view are externalist in nature, and rest on a form of reliabilism about justification. Reliabilism is the view that a belief is justified when it is produced by a reliable process (Goldman 1979). A process is reliable when it tends to produce more true beliefs than false beliefs. This theory counts as externalist because the reliability of a belief-forming process is not internal to a subject's mind and is not accessible to introspection. Reliabilism, as stated, concerns immediate justification because the reliability of a process can generate justification all on its own, independent of any other justification a subject has.[30] What matters is that the process is in fact reliable, not that the subject has justification for believing that it is reliable.

[30] Reliabilists can also account for mediate justification in terms of conditional reliability, which is the tendency of a process to produce true beliefs than false given that it takes reliably produced beliefs as inputs. Conditional reliability is a form of mediate justification since it depends on the reliability, and thus the justificatory status, of the input beliefs. However, since appealing to conditional reliability would be of no help to a proponent of the immediate justification view, I do not explore it further here.

Many theorists endorse a kind of reliabilism about imaginative justification. For example, Williamson argues that the imagination can justify belief because "the imagination develops…in a reality-oriented way, by default" and thereby "constitutes a reliable way of forming a true belief" (2016, p. 116-7). Similarly, Kind argues that "our ability to constrain our imaginings in light of facts about the world enables us to learn from them" (2016, p. 146). Specifically, Kind argues that imaginings must meet what she calls the "reality constraint"—they must "capture the world as it is" (2016, p. 150) and thus be reliable.[31]

One could also develop an internalist version of the immediate justification view. Consider phenomenal dogmatism (sometimes also referred to as phenomenal conservatism), a popular internalist theory of immediate justification. On this view, some experiences have a special phenomenal character that confers immediate justification on the content of those experiences. This phenomenal character (alternatively referred to in the literature as 'phenomenal force,' 'phenomenal presence,' 'forcefulness,' or 'seeming') is, as Pryor puts it, "the feeling of seeming to ascertain that a given proposition is true" (2004 p. 357). The phenomenology itself takes a stand on how the world is; it asserts its content as true. This view is internalist because this special phenomenal character is

[31] In fact, the reality constraint, as stated, is even stronger than most forms reliabilism. It requires that imaginings be completely accurate to confer justification, as opposed to just tending to produce true beliefs. However, Kind is clear that the reality constraint represents an epistemic ideal, and that imaginings can justify belief when they approximate this ideal.

internal to a subject's mind, and easily accessible to introspection. It concerns immediate justification because the justification in question depends only on a subject's phenomenal character and not on any other justification the subject has. This special phenomenal character does not itself require any prior justification in order to confer justification.

One can extend phenomenal dogmatism to account for imaginative justification by holding that imaginings can also instantiate this special phenomenal character. Just as perceptual experiences can make it seem to a subject as if their content is true, so too can imaginative experiences. For example, in *Mental Jigsaw Puzzle*, it is plausible your imaginative experience has the phenomenology of making it seem to you as if the puzzle piece will fit in the spot. No one has explicitly endorsed phenomenal dogmatism about imaginative justification of empirical belief, although nearby views have been discussed in the literature.[32] Hyde (2021) argues that phenomenal dogmatism is compatible with the possibility of imaginative justification but stops short of endorsing it. Chudnoff (2012) and Kriegel (2021) give phenomenal dogmatist accounts of how imaginings can immediately justify beliefs about what is possible, but deny that imaginings can ever immediately justify empirical beliefs.

[32] In my opinion, this is an important lacuna in the contemporary literature on phenomenal dogmatism. If phenomenal dogmatism is to be a comprehensive account of justification, as some theorists want it to be (e.g. Huemer 2007), then it must account for imaginative justification. I suspect that this oversight arises from the fact that many phenomenal dogmatists use imagination as an example of a mental state that lacks the relevant phenomenology in order to provide a contrast with perception (e.g. Tucker 2010). But the claim that imagination lacks the relevant phenomenology is not a core commitment of phenomenal dogmatism in general.

Reliabilism and phenomenal dogmatism about imaginative justification are not the only ways of developing the immediate justification view. However, they are both extensions of popular views in epistemology, and therefore help to demonstrate the theoretical appeal of the immediate justification view.

2.3 Against the Immediate Justification View

We have seen that the immediate justification view is both well-motivated and widely endorsed. However, in this section I will argue that it is false. Imaginings do not confer immediate justification. Instead, imaginative justification at least partially depends on a subject's prior justification.

Consider the following paradigmatic case of forming a belief based on the imagination.

> *Bedroom Layout*: Rachel recently signed a new lease and is planning out how to arrange her furniture in her new apartment. To figure out whether her bed and her nightstand will both fit against the same wall in the bedroom, she imagines trying to push both the bed and the nightstand against the wall. As her imagining unfolds, she imagines the bed and nightstand fitting against the wall with a few inches to spare. Based on this imagining, Rachel forms the belief that her bed and nightstand will both fit against the bedroom wall.

Is Rachel's belief justified on the basis of her imagining? As it stands, there is no clear answer. We need to fill in more of the details. Consider the following variation on this case:

> *Unjustified Bedroom Layout:* Rachel has never actually visited the apartment in-person before. She imagines the bedroom on the basis of photos from the listing website, which she knows are often digitally edited to make rooms look bigger than they are. She ordered the bed and nightstand online through a used-furniture marketplace, and the website didn't have any information regarding their precise measurements. Thus, her imaginative project is informed by a belief about the dimensions of the bedroom that she herself thinks is doubtful coupled with a guess about the size of the furniture.

Intuitively, Rachel's belief in *Unjustified Bedroom Layout* is not justified. Given the quality of her prior information about the subject matter of her imagining, the fact that she imagines the bed and nightstand fitting against the wall does not give her much, if any, reason to believe that they will actually fit. Moreover, Rachel's imagining fails to confer justification precisely because she does not have adequate prior justification that supports the content of her imagining. The thesis that imaginative justification is mediate explains why Rachel's imagining does not confer justification in *Unjustified Bedroom Layout.*

This explanation finds further support when we contrast *Unjustified Bedroom Layout* with a different variation on the case:

> *Justified Bedroom Layout:* Rachel is currently sitting in her new bedroom with a clear view of the wall as she carries out her imaginative project. She has also owned her bed and nightstand for many years and has a good sense of their sizes. So, her imaginative project is informed by excellent perceptual evidence about the size of the bedroom and excellent memorial evidence about the size and shape of the furniture.

Intuitively, Rachel's imagining in *Justified Bedroom Layout* justifies her belief. Importantly, we can stipulate that *Justified* and *Unjustified Bedroom Layout* do not differ in any putatively relevant respect other than the quality of Rachel's antecedent justification. For example, we can stipulate that Rachel's imagining is veridical and that her belief is true in both cases. More pertinently, we can stipulate that Rachel is generally reliable at imaginative spatial reasoning. We can also stipulate that Rachel's imaginings in both cases are phenomenologically identical, both in their sensory phenomenology and in their phenomenal force.

Even with these stipulations in place, the intuition that there is a justificatory difference between the two variations on *Bedroom Layout* persists. There is something epistemically deficient about Rachel's belief in *Unjustified Bedroom Layout* that does not

carry over to *Justified Bedroom Layout.* The best explanation of this justificatory difference is that imaginative justification is mediate. It depends, at least in part, on a subject's antecedent justification. Rachel's belief in *Unjustified Bedroom Layout* is not justified precisely because Rachel does not possess adequate evidence about the size and shape of the bedroom and furniture, while her belief in *Justified Bedroom Layout* is justified because she possesses excellent evidence about the size and shape of the bedroom and furniture. In other words, imaginings are only as good as the evidence they are informed by. An imaginative project that is informed by poor evidence is itself poor evidence. So, the imagination is not a foundational source of justification. Instead, it builds on top of prior justification.

One might object that we can explain the intuition that there is a justificatory difference between *Unjustified* and *Justified Bedroom Layout* by appealing to defeaters. On this alternative explanation, Rachel's imagining confers the same amount of prima facie justification in both cases, but in *Unjustified Bedroom Layout* this justification is defeated while in *Justified Bedroom Layout* it is not. This suggestion saves the immediate justification view because it holds that Rachel's imagining confers the same amount of justification in both cases and that Rachel's antecedent justification only makes an epistemic difference at a later stage, after the imagination has already done its justificatory work. Thus, although Rachel's antecedent justification makes a difference to whether her belief is all-

things-considered justified, it does not make a difference to the amount of justification that the imagination itself confers.

I have several things to say in response. First, I think it is plausible not just that there is a difference in whether Rachel's beliefs are all-things-considered justified, but also that there is a difference in the amount of *prima facie* justification that her imagination confers. In Unjustified Bedroom Layout, Rachel's imaginative project is informed by unjustified beliefs and mere guesses. Unjustified beliefs and mere guesses do not supply any prima facie justification, and the same goes for imaginative projects that are formed on their basis.

Second, we can construct analogous cases in which the appeal to defeaters is even less plausible. Here is a general principle about justification that is relatively uncontroversial: desiring that p does not confer any amount of *prima facie* justification for believing that p. Simply wanting something to be the case does not give you any justification—even *prima facie* justification—for believing that it is true. It is not just that we often possess defeaters for believing the contents of our desires, but rather that desires give one no reason to believe that their contents are true in the first place.

Now consider a third variation on *Bedroom Layout*:

Wishful Thinking Bedroom Layout: Rachel is highly invested in arranging her bedroom with the bed and nightstand against the same wall—all the other

> alternative ways of arranging the furniture are undesirable. The content of her imagining is primarily (perhaps exclusively) influenced by her desire to make both pieces of furniture fit, rather than her evidence about whether they will fit. As a result, she imagines the furniture as taking up less space than she would have if her imagining were not influenced by her desires.

This case is an imaginative analog of wishful thinking.[33] Instead of directly basing her belief on her desires, Rachel bases her belief on an imagining that is informed by her desires. The fact that Rachel's wishful thinking is mediated by her imagination makes no epistemic difference. Just as desiring that p does not confer any prima facie justification on believing that p, neither does imagining that p on the basis of a desire that p confer any prima facie justification on believing that p. Wishful thinking is a paradigmatic example of a process that lacks any (even prima facie) justificatory force, whether it crops up in imagination or elsewhere. This verdict remains intuitive even when we stipulate that Rachel's belief that the furniture will fit is true, that her imagining makes it seem to her as if it is true, and that she is generally reliable at imaginative spatial reasoning.

At this point, the proponent of the immediate justification has two options: either they can deny that imaginative wishful thinking is epistemically analogous to non-imaginative wishful thinking, or they can deny that wishful thinking does not confer any

[33] This example of imaginatively mediated wishful thinking has much in common with Siegel's (2012, 2017) examples of perceptually mediated wishful thinking.

prima facie justification. Neither option is attractive. With respect to the first option, it is unclear why imaginatively representing the content of a desire would carry any more epistemic weight than the desire itself. The second option, on the other hand, entails that we are *prima facie* justified in believing the contents of all of our desires, which seems absurd. Once again, why would merely desiring that something is true give rise to even *prima facie* reasons for believing that it is true?

To sum up: the view that imaginings immediately justify beliefs cannot account for the fact that imaginative justification depends on a subject's prior evidence. Whether or not an imagining has justificatory force depends on whether its content is supported by a subject's prior justification and how much justificatory force an imagining has depends on the strength of the prior justification it is supported by. Thus, the justificatory force of the imagination depends, at least in part, on other justification that a subject has. Imaginative justification is mediate.

2.4 The Inferential Justification View

If imaginative justification is mediate, then perhaps it is inferential. Inferential justification is justification that depends on other justified beliefs and is the most familiar form of mediate justification.[34] This motivates the inferential justification view, according

[34] Indeed, many philosophers use 'mediate' and 'inferential' interchangeably.

to which beliefs formed in response to imaginative episodes are justified in virtue of being inferred from other justified beliefs.

The inferential justification view can accommodate the objection leveled against the immediate justification view in the previous section. If imaginative justification is inferential, then we would expect it to depend on a subject's prior justification. More specifically, Rachel's belief is justified in *Justified Bedroom Layout* because she carries out an inference from her prior justified beliefs, and it is not justified in *Unjustified Bedroom Layout* and *Wishful Thinking Bedroom Layout* because inferences with unjustified beliefs and mere desires as premises cannot confer justification. The inferential justification view also has the added theoretical virtue of assimilating justification by imagination to the more familiar justification by inference, thereby accommodating the thesis that imaginings can justify beliefs without positing a distinct, *sui generis* form of justification.

There are two different ways of cashing out the idea that imaginative justification is inferential. First, one could claim that imaginings are themselves inferences. Second, one could claim that imaginings only confer justification in tandem with a separate, non-imaginative inference.

I opt for understanding the inferential view in the second way. On the first way of developing the view, the disagreement between inferential and non-inferential views of imaginative justification is a disagreement over whether imaginings count as inferences.

This threatens to devolve into a merely verbal dispute over the term 'inference.' As we will see over the course of this dissertation, there are various ways that the imagination is importantly inference-like. But the nature of inference is hotly debated, and I do not want to take a stand on whether the similarities between imagination and inference are sufficient for the imagination to itself be a form of inference. Instead, I will understand the inferential justification view as requiring a distinct, non-imaginative inference for beliefs formed in response to imaginings to be justified. This yields a substantive, non-verbal dispute. Proponents of the inferential justification view hold that imaginings must be accompanied by a separate non-imaginative inference in order to confer justification while opponents of the inferential justification view do not require any separate inference. Moreover, this better captures the rhetoric and motivations of actual proponents of the inferential justification view, who often deny that the imagination can justify beliefs on its own regardless of whether it can be accurately described as an inference.

There is an important sense in which the inferential justification view is a form of pessimism about imaginative justification. According to the inferential justification view, imaginings themselves do not have justificatory force—they cannot justify beliefs on their own. It is a separate, non-imaginative inference that is doing the justificatory work. The imagination is, as it were, epistemically epiphenomenal. However, there are a number of

substantive differences between how these views are implemented that justify treating them separately. While proponents of pessimism typically hold that beliefs based on imaginative projects are always unjustified, proponents of the inferential justification view typically hold that many beliefs formed on the basis of imaginative projects are justified insofar as they are accompanied by an appropriate inference. In addition, as we will see, many proponents of the inferential justification view hold that the imagination is essential for supplying the content of the inference, and thus that it plays an important epistemic role. For these reasons, many proponents of the inferential justification view have seen themselves not as opposing the possibility of imaginative justification, but instead as giving an account of its nature.

The inferential justification view says that imaginings justify in tandem with an inference, but it does not, on its own, take a stand on the content of that inference. We can distinguish between two versions of the inferential justification view that can be found in the literature, each of which posits a different kind of inference. According to the *first-order inferential view*, imaginative justification involves an inference from one's first-order beliefs about the subject matter of one's imagining. According to the *metacognitive inferential view*, imaginative justification involves an inference from one's metacognitive beliefs about the imagining itself. In the following two subsections, I will explain and object to each view in turn.

2.4.1 The First-Order Inferential View

The first-order inferential view holds that imaginative justification involves an inference from your prior beliefs about the subject matter of the imagining. This view is best illustrated by example. Recall *Mental Jigsaw Puzzle* from the beginning of this chapter:

> *Mental Jigsaw Puzzle*: You are assembling a jigsaw puzzle. You are just about done and only have a few pieces which are missing. You select a piece and imagine trying to place it into one of the open spaces. You imagine rotating it until you imagine it fitting snugly. You form the belief that the piece fits into the open space.

According to the first-order inferential view, your belief is justified by inferring it from your prior beliefs about the shape of the piece, the shape of the open space, and facts about what it takes for one object to fit with another. We can schematize a somewhat oversimplified version of this inference as follows:

1. The puzzle piece is x-shaped.
2. The open space is y-shaped.
3. X-shaped things fit snugly into y-shaped spaces.

C. The puzzle piece will fit snugly into the open space.

On this view, your prior beliefs about the subject matter of your imagining (represented by premises 1, 2, and 3) do all the work in justifying your belief that the puzzle piece will fit into the open space.

The proponent of the first-order inferential view generalizes this explanation to all epistemic uses of the imagination. This view holds that all epistemic uses of the imagination involve an inference from one's prior beliefs about the subject matter of the imagining. So, for example, when you use your imagination to figure out how another person is feeling, what actually justifies your belief is an inference from your beliefs about that person. Similarly, when you use your imagination to figure out what a new dish will taste like, what actually justifies your belief is an inference from your beliefs about what each ingredient tastes like, or what similar dishes taste like.

The first-order inferential view has many proponents. For example, Spaulding argues that the imagination can only yield knowledge when "supplemented with general background information, theoretical knowledge pertaining to the particular subject matter, and general cognitive capacities for abductive, inductive, and deductive reasoning" (2016 p. 221-222). Spaulding argues that the imagination merely generates ideas that are then justified by inferring them from one's background knowledge. Similarly, Mallozzi argues that "it is unclear that imagination plays the required epistemic role for knowledge [and] that anything more than inferential reasoning is

involved," and that the imaginative episodes associated with epistemic uses of the imagination are nothing more than an "accidental byproduct of inferring based on background knowledge" (2021, p. 176).[35]

I want to level two objections against the first-order inferential view: the *not-true-to-phenomenology objection* and the *not-enough-beliefs objection.*

The *not-true-to-phenomenology objection* holds that the first-order inferential view fails to capture the phenomenology of forming beliefs based on the imagination. When we form beliefs in response to our imaginings, we typically introspect the imagining itself, but we do not typically introspect an additional, non-imaginative inference. In *Mental Jigsaw Puzzle,* you imagine rotating the puzzle piece and then form a belief that the puzzle piece will fit by taking the content of your imagining at face value. If you are anything like me, then you do not have the phenomenology of undertaking an additional mental action involving an inference from your prior beliefs. So, the first-order inferential view posits an inference that goes beyond the typical phenomenology of forming beliefs on the basis of the imagination.

The proponent of the first-order inferential view might respond that the relevant inference typically occurs unconsciously or subpersonally and that this explains why

[35] Egeland (2021) holds that imaginings do not generate new justification and instead merely allow one to base beliefs on evidence one already has. Egeland is not clear about what form this prior evidence takes. If it takes the form of beliefs, then Egeland is committed to a version of the first-order inferential view. This unclarity aside, Egeland's view is at least closely related to the first-order inferential view.

imaginative projects are not typically accompanied by the phenomenology of inference. This strikes me as somewhat ad hoc. The proponent of the first-order inferential view is positing unconscious inferences—which is an empirical claim—just to save their favored epistemological theory. Moreover, it is strange to posit a subpersonal inference that is doing all the justificatory work in what is otherwise a conscious, deliberate, personal-level inquiry.

There are further problems that result from positing unconscious inferences. Given that we are typically unaware of the putative inferences, the first-order inferential view is committed to the claim that we are often incorrect about what our beliefs that are formed in response to imaginative projects are based on. When subjects form a belief in response to an imagining, they will typically point to the imagining as the epistemic basis of their belief. This is corroborated by empirical research using self-report methods which finds that subjects often report basing beliefs on their imagination in physical and spatial reasoning tasks (Barratt 1953, Clement 1994). However, if the first-order inferential view is correct, then beliefs formed in response to imaginative projects are not actually *based* on those imaginative projects, but are instead based on a separate inference. The first-order inferential view is therefore committed to the unmotivated claim that subjects are systematically deceived about the basis of their own beliefs.[36]

[36] This commitment will be especially unattractive to theorists who hold that the epistemic basing relation is essentially self-reflective (Boghossian 2014).

More devastating to the first-order inferential view is the *not-enough-beliefs* objection, which holds that the content of the imagination often goes beyond the content of one's prior beliefs in ways that are epistemically relevant, allowing one to draw conclusions on the basis of one's imaginings that one would not be able to draw on the basis of an inference from one's background beliefs alone. Consider the following case:

> *Basketball Trajectory:* Suppose you are trying to estimate whether a basketball that is moving through the air will score or not. In order to answer this question, you imagine the ball continuing to move along its trajectory. As your imagining unfolds, you imagine the ball falling through the net and form the corresponding belief that the ball will score.

The first-order inferential view is committed to this belief being justified by an inference from your background beliefs about the initial state of the basketball along with general beliefs about how objects move through the air. But it is implausible that you have enough beliefs to infer the precise trajectory of the basketball. After all, this would require an extremely rich set of beliefs about physics as well as the initial state of the basketball. Most people do not have an explicit and fully articulated theory of physics at their disposal. Thus, the first-order inferential view cannot explain how your belief is justified in *Basketball Trajectory*.

This intuitive judgment is corroborated by several empirical sources. Shwartz and Black (1999) conducted an experiment in which subjects were asked to reason about whether a narrow or wide cup filled to the same height with water would spill first when tilted. They found that subjects were much more accurate when they were asked to imagine rotating the two cups, versus when they were asked to verbally reason about the problem. This suggests that subjects did not have enough prior beliefs to form an adequate inference base in the verbal reasoning condition. Indeed, the experimenters themselves conclude that "people did not have a propositional knowledge base, explicit or implicit, that could have led to the accurate tilting" (Schwartz & Black 1999, p. 131). The fact that subjects systematically failed to construct an argument in the verbal reasoning condition suggests that a non-imaginative inference cannot explain their success in the imagination condition. The imagination contributes to justification over and above a subject's background beliefs.

Similar conclusions can be drawn from a series of studies that suggest that people reason about physical systems by engaging in imaginative simulations that evolve according to roughly Newtonian principles (Battaglia et al. 2013, Hamrick et al. 2016). For example, subjects' judgments about whether a tower of blocks is stable or not are best predicted by a model that utilizes simulations which evolve according to Newtonian dynamical principles coupled with noise and uncertainty about the initial state (Battaglia

et al. 2013). But it is simply very implausible that subjects believe a fully articulated Newtonian theory of physics. It is much more plausible that these Newtonian principles govern how imaginings unfold over time without themselves being explicitly believed.

There is also empirical evidence that epistemically relevant features of the imagination can vary without any corresponding variation in a subject's background beliefs. Some studies have found that subjects get better at discriminating between certain features simply by repeatedly imagining them (Tartaglia et al. 2009, 2012). Other studies show that subjects can get better at constructing vivid mental imagery through practice alone (Rodgers et al. 1991, Calmels et al. 2004). In both sets of studies subjects become more skilled at carrying out imaginative projects in ways that make an epistemic difference, but which do not involve any change to their first-order beliefs about the subject matter of their imaginings.

All these lines of empirical evidence can be unified and explained by a plausible and increasingly popular hypothesis about the architecture of the imagination. Recently, several authors have proposed that imaginings develop by making use of perceptual models that encode environmental regularities (Langland-Hassan 2016, Williams 2021). These models are used in online perception to predict incoming sensory input, but can be run offline, in the absence of sensory stimulation, to govern how imaginings unfold. Importantly, these models are located within the perceptual system itself and are thus

represented sub-doxastically.[37] This architectural hypothesis explains how the imagination can draw on information that goes beyond a subject's beliefs, and thus how it can confer justification that could not be arrived at by a belief-based inference.

In sum, the first-order inferential view posits inferences that are introspectively dubious and epistemically invalid. Together, the not-true-to-phenomenology objection and the not-enough-beliefs objection give us reason to reject the first-order inferential view.

2.4.2 The Metacognitive Inferential View

In contrast to the first-order inferential view, which holds that imaginings justify belief in tandem with an inference about the subject matter of the imagining, the metacognitive inferential view holds that imaginings justify belief in tandem with an inference about the imagining itself. More specifically, the metacognitive inferential view posits an inference from beliefs about the trustworthiness or reliability of the imagination.

To illustrate, consider *Mental Jigsaw Puzzle* once again. The metacognitive inferential view posits that something like the following inference is what justifies your belief that the puzzle piece will fit:

1. I imagine that the puzzle piece fits snugly into the open space.

[37] Langland-Hassan goes further and suggests that these models "may not be explicitly represented at all" (2016 p. 70). On this view, the principles by which imaginings unfold are built into the functional architecture of the system rather than being part of the content of any representational state.

2. My imagination is generally reliable.

C. The puzzle piece will fit snugly into the open space.

On this view, your beliefs about your imagining do all the work in justifying your belief that the puzzle piece will fit into the open space. While your imagining contributes to your (introspective) justification for believing the first premise, it only has the power to justify empirical belief in tandem with a belief in its reliability.

The metacognitive inferential view enjoys many of the same philosophical motivations as the first-order inferential view: it captures the mediacy of imaginative justification while assimilating it to the more familiar justification by inference. In addition, it can be motivated by broader epistemological considerations. Some epistemologists endorse the general principle that a belief-forming process can only confer justification if one knows (or is justified in believing) that it is reliable.[38] If we apply this principle to imagination, we get the conclusion that imagination only yields justification if one knows (or is justified in believing) that their imagination is reliable. This is just a short step away from the metacognitive inferential view as I have formulated it. Thus, more general considerations about the nature of epistemic justification itself can motivate the metacognitive inferential view.

[38] Cohen is one notable and influential defender of this principle, although he formulates it in terms of knowledge rather than justification: "A potential knowledge source K can yield knowledge for S, only if S knows K is reliable" (2002, p. 309). See also Steup 2019.

Like the first-order inferential view, the metacognitive inferential view is also widely endorsed in the literature on the epistemology of imagination. Dorsch is the clearest proponent, claiming that imaginative justification depends on our "knowledge that our imaginative experiences are the product of a reliable…instance of imagining" (2016, p. 11). Dorsch requires the belief that the imagining is reliable because, on his view, imaginings do not by themselves represent their contents as true and thus do not on their own justify a belief that their content is true. The belief that the imagining is reliable is what allows one to bridge this gap. Currie and Ravenscroft also seem to endorse the metacognitive inferential view when they claim, in the context of discussing imaginative reasoning about other minds, that "it is hard to see how any imagining could, in any circumstances, immediately and non-inferentially justify any belief" (2002, p. 56). In spelling out this idea, they claim that an imagining can only justify beliefs in tandem with a belief that the imagining accurately (or reliably) represents its target.

The metacognitive inferential view is subject to the same objections as the first-order inferential view. It posits an inference that is far from phenomenologically apparent, and it is not clear that most people have the relevant prior beliefs. However, instead of rehashing these concerns, I want to pursue a different objection.

In my view, the most significant problem for the metacognitive inferential view is the respect in which it overintellectualizes imaginative justification. We can call this the *overintellectualization objection*.

The metacognitive inferential view requires subjects to form a metacognitive belief about the content of their imagining and a metacognitive belief about their past track record of forming beliefs on the basis of their imagination. These beliefs are cognitively and conceptually sophisticated. They require subjects to have the concept of IMAGINATION and the concept of RELIABILITY. They also require subjects to be able to reflect on their mental states and to reason about their past successes and failures as epistemic agents. These conditions exclude subjects who are relatively conceptually and metacognitively unsophisticated from being able to form justified beliefs based on their imaginings.

This is problematic, since there is good evidence that conceptually and metacognitive unsophisticated subjects *can* form justified beliefs on the basis of their imaginings. One line of evidence comes from the literature on mental imagery in infants and young children. Prelinguistic children can use mental imagery to successfully engage in spatial reasoning and motor planning. One study trained infants to associate a small object and a large object with two different sounds (Clifton et al. 1991). They were then given the opportunity to reach for these objects in the dark based on the sound alone. By 6 months, infants were able to adapt their grasp size to the size of the object, as indicated

by the sound, suggesting that they were able to visually imagine the objects and use that imagining to guide their behavior. One might propose an alternative explanation according to which infants merely learned a brute association between tone and grip size. However, other studies show that infants can engage in flexible behavior that is best explained by the formation and manipulation of imaginative representations rather than mere associations.

There is robust evidence that infants as young as 3 to 6 months old can mentally rotate objects to decide whether they are the same or different (Moore & Johnson 2008, Quinn & Liben 2008, Moore & Johnson 2011, Möhring & Frick 2013, Johnson & Moore 2020). For example, in Moore & Johnson 2008 and 2011, infants were habituated to a video of a three-dimensional object rotating back and forth 240 degrees around the vertical axis. Once they had become habituated to this stimulus, as indicated by continuously decreasing looking times, infants were shown two novel stimuli. In one display, they were shown the same object rotating through the previously unseen 120 degrees. In the other display, they were shown a mirror image of the familiar object rotating through the same 120 degrees. Although both stimuli were novel, male infants spent more time looking at the mirror-image object rather than the familiar object. This indicates that they were able to recognize the habituation object from a novel perspective, which presumably requires the ability to mentally rotate one object to match the orientation of the other and

compare their shapes. Another study asked infants to place objects with different shaped cross-sections into holes with corresponding shapes (Ornkloo & von Hofsten 2007). Successful completion of this task required infants to mentally rotate the objects to determine whether they will fit into the hole. Experimenters found that by 22 months, infants were able to consistently solve this problem. Mental rotation ability continues to improve, both in terms of accuracy and speed, throughout childhood (Frick, Hansen, & Newcombe 2013, Kosslyn et al. 1990). Importantly, successful performance on mental rotation paradigms requires more than mere associative learning. Stimuli are presented from novel perspectives such that infants must recover the identity of the objects by forming and manipulating an imaginative representation.

So, infants can reliably form accurate judgments on the basis of their imagination. It is much less clear, however, whether young children possess the requisite conceptual, metacognitive, and inferential capacities to carry out the kind of inference that the metacognitive inferential view requires. While some studies show that children as young as 4 years old can verbalize that they used mental imagery to carry out a matching task (Estes 1998), it is doubtful that they have the conceptual sophistication to form justified beliefs about the reliability of their imagination.[39] It is even more doubtful that 3-to-6

[39] In Estes 1998, one four-year-old explained how they performed the matching task by saying "My brain has eyes and they help me see things on the screen." Similarly, a six-year-old is quoted as saying that they "turn[ed] this one around in my mind." While these quotes show some degree of metacognition about mental imagery, they suggest a lack of sophisticated mental concepts.

month old infants can do so. Indeed, in many of the aforementioned studies, children were able to spontaneously act on the basis of their mental imagery in ways that do not suggest that they were relying on anything so demanding and time-consuming as deliberative metacognition or explicit inference.

There is also evidence that non-human animals rely on imagination to solve problems and form beliefs about their environment.[40] Although it is difficult to gauge the extent to which animals rely on imagination in the absence of verbal reports, there is limited but suggestive evidence that animals such as sea lions (Mauck & Dehnhardt 1997, Stich et al. 2003), rhesus monkeys (Köhler et al. 2005), and pigeons (Hamm, Matheson, & Honig 1997, Neiworth & Rilling 1987, although see Hollard & Delius 1982 for an opposing view) all possess the ability to mentally rotate objects using their imagination in order to judge whether two objects are the same or not.[41] Since these animals can use their imagination to successfully solve problems and navigate their environments, there is reason to think that they can form justified beliefs on the basis of their imaginings. But, compared to the case of young children, there is even less reason to think that animals have the relevant conceptual and metacognitive capacities to carry out the inference required by the metacognitive inferential view.[42]

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[40] See Blaisdell 2019 for an overview of debates over mental imagery in animal cognition.
[41] See also Gauker 2017, who argues that problem solving abilities in monkeys and apes are best explained by appealing to sensory imagination.
[42] See Carruthers 2008 for a skeptical appraisal of evidence for metacognition in animals.

The empirical evidence regarding the nature and extent of mental imagery in children and animals is less than conclusive. Indeed, it is a matter of some debate exactly how to interpret the studies regarding mental imagery in animals. Nevertheless, at the very least, it is conceivable for there to be a creature who uses their sensory imagination to form beliefs about their environment without having the conceptual capacities to form beliefs about the content and reliability of their imaginings. And, insofar as this hypothetical creature's imagination allows them to reliably form true beliefs and successfully plan actions, it would be quite natural to think that the beliefs they form on its basis are justified.

The overintellectualization objection arises not just in the case of infants, animals, and hypothetical creatures, but in normal adult humans as well. It is doubtful that we typically go through an explicit inference about the reliability of our imagination each time that we form a belief on its basis. In many cases, we simply accept the deliverances of our imagination at face value without considering its reliability. You might form the belief that the puzzle piece will fit into the open space on the basis of your imagination without reflecting on your past imaginative track record at all. Indeed, it is doubtful that we typically or even often go through an automatic or unconscious inference about the reliability of the imagination. Of course, people may sometimes carry out such an inference. But the point is that it is not characteristic of how we typically form beliefs on

the basis of our sensory imagination. Since the metacognitive inferential view requires an inference of this sort for imaginative justification, it incorrectly predicts that the beliefs we form based on our imaginings are typically unjustified.

So far, I have been understanding the metacognitive inferential view as requiring that we token the relevant metacognitive beliefs and explicitly carry out an inference from these beliefs for the resulting belief to be justified. But perhaps a more promising version of this view merely requires that we have propositional justification for these metacognitive beliefs. So, the mere fact that young children, animals, and even most adult humans fail to form beliefs about the reliability of their imaginings is no barrier to their having imaginative justification. What matters is that they have good reasons to form those beliefs, regardless of whether they do, or even can, form them.

This view is untenable. Notably, it undermines one of the very motivations for the inferential justification view. The datum to be explained is that beliefs formed in response to imaginings are, at least in some cases, doxastically justified. The inferential justification view promised to explain this by understanding imaginative justification as a species of inferential justification. A belief is doxastically inferentially justified when it is properly based on other justified beliefs. But, in this revised version of the inferential justification view, the subject need not actually have any beliefs to base the belief in question on. Thus,

this weaker version of the metacognitive inferential view fails to explain how beliefs formed in response to imaginings are doxastically justified.

In addition, even this weaker view is too demanding. Not only does one not need to form the relevant metacognitive beliefs in order to get justification, but they do not even need propositional justification for them. To see this, we need to distinguish between lacking justification for believing that your imaginings are reliable and possessing justification for believing that your imaginings are unreliable. Clearly, the latter is a defeater for imaginative justification. If you believe that you are a horribly unreliable imaginer, then this may very well defeat any justification your imaginings would otherwise give you. If you had this belief, then beliefs formed on the basis of your imaginings would be unreasonable from your own perspective, given that you don't think your imagining is a reliable guide to what the world is like.

However, merely lacking justification for believing that your imaginings are reliable is not a defeater on imaginative justification. For example, suppose that it is your first time using your imagination for spatial reasoning and thus have no evidence either for or against the proposition that your imaginative spatial reasoning tends to be reliable. Nevertheless, as long as you construct your imagining in a way that is careful, skillful, and sensitive to your evidence, it seems that your imagination can give you justification. Note that everyone is in a position where they lack justification for believing that they are

reliable at epistemic imaginative projects at some point in their lives. It is counterintuitive to think that no matter how carefully and skillfully you construct your imaginings, your first few beliefs formed on the basis of the imagination will always be unjustified and they only begin to be justified once you build up enough of a track record to justifiably believe that they are reliable.

Both versions of the inferential justification view build on the same basic idea: imaginings confer justification only in tandem with an inference. They differ on the nature of that inference. The first-order inferential view holds that imaginings justify beliefs in tandem with an inference from one's beliefs about the subject matter of the imagining. The metacognitive inferential view holds that imaginings justify beliefs in tandem with an inference from one's beliefs about their imagining itself. While each version of the inferential justification view has its own set of problems, both fail for similar reasons. In at least some cases, subjects justifiably accept the deliverances of their imagination without engaging in a separate non-imaginative inference.

2.5 The Mediate Justification View

I have argued that the immediate justification and inferential justification views fail as general theories of imaginative justification. The imagination does not confer justification in way that doesn't depend on a subject's prior justification, nor does it only

confer justification in tandem with a separate inference. If these two views fail, then what is the alternative? How *do* imaginings justify beliefs?

The way forward is to hold that imaginative justification is mediate but non-inferential.[43] Imaginings confer justification that depends on one's prior justification but does not depend on inference. Call this the *mediate justification view*. Let me close out this chapter by briefly sketching out the contours of the mediate justification view and showing how it improves upon its competitors.[44]

We can think of the imagination as a process that has inputs and outputs. For our purposes, the outputs of imagination are beliefs. The inputs are the mental states that determine the content of the imagining. Following common terminological practice, we can call these inputs 'constraints.'[45] For example, in *Mental Jigsaw Puzzle* you don't imagine the jigsaw puzzle in a completely unconstrained way. Instead, your imagining is to some extent determined by your perceptual experience of the puzzle piece as well as your prior beliefs about how solid objects keep their shape as you rotate them. These mental states constrain the content of your imaginative project. Of course, you *could* choose to imagine the puzzle piece as shaped differently, and you *could* choose to imagine

[43] See Chudnoff 2018 for a view of the epistemic structure of perceptual learning that appeals to mediate, non-inferential justification.
[44] I have defended versions of the mediate justification view (although not labeled as such) in Myers 2021a and 2021b.
[45] See Kind 2016, 2018, Myers 2021a, 2021b.

the puzzle piece as changing shape as it is rotated. But given that you constrain your imagining with these perceptions and beliefs, they determine that your imagining will have a certain content—it will represent the puzzle piece as being the way that you perceive and believe it to be. Similarly, in *Basketball Trajectory*, you are free to imagine the trajectory of the basketball in any way you would like. You can, for example, choose to imagine the basketball reversing course in mid-air and accelerating backwards for no reason. But insofar as your imagining is constrained by your prior beliefs and expectations, you will imagine the basketball as following a certain trajectory: the trajectory that your prior beliefs and expectations make most likely.

My proposal is this: imaginative justification depends, at least in part, on the justification provided by the imaginative constraints.[46] When constraints lack justificatory force, the imagining that they constrain will also lack justificatory force. However, imaginative justification does not depend on a separate inference from these constraints. The fact that the imagining has constraints with justificatory force is enough. In short: the imagination conducts justification from the states that constrain it (the inputs) to the beliefs that are based on it (the outputs).

Mediate justification is justification that at least *partially* depends on a subject's prior justification. Since it relies on a notion of partial dependence, the mediate

[46] In Myers 2021a, I called this the 'justificatory force condition'.

justification view leaves open whether having constraints with justificatory force is sufficient for imaginings to confer justification. Imaginative justification may also depend on other factors. It is a virtue of the mediate justification view that it leaves this as an open question. The mediate justification view is a view about the *structure* of imaginative justification—it is an answer to the question of how imaginative justification relates to other justification. It is therefore compatible with different views about whether there are other, non-structural conditions on imaginative justification. Relatedly, the mediate justification view does not take a stand on whether the justification provided by the constraints exhausts the justification conferred by the imagination. It is possible for imaginative justification to partially depend on prior justification while also going beyond that prior justification. A useful analogy would be ampliative inference. Ampliative inferences depend on the justification provided by their premises while also going beyond the justification provided by their premises. It is an open question whether imaginings amplify or merely preserve the justification provided by their constraints.[47]

The mediate justification view avoids the objections that befall its competitors. The immediate justification view had difficulty explaining why imaginative justification covaries with a subject's prior information. Imaginings that are otherwise identical can differ in justificatory force when different information is brought to bear on them. The

[47] Although, it will not be an open question for long. In chapter 3, I will argue that imaginings can generate new justification that goes beyond the prior justification provided by their constraints.

mediate justification view has no trouble explaining this. Imaginative projects that have unjustified beliefs (see *Unjustified Bedroom Layout*) or mere desires (see *Wishful Thinking Bedroom Layout*) as constraints cannot justify belief because unjustified beliefs and mere desires do not have justificatory force. The mediate justification view also avoids the objections leveled against the first-order inferential view. First, the mediate justification view avoids the not-true-to-phenomenology objection because it does not posit an introspectively obscure inference. Second, the mediate justification view avoids the not-enough-beliefs objection because instead of grounding imaginative justification solely in a subject's prior beliefs, it grounds it in all the different states that constrain the imagination, doxastic or otherwise. Finally, the mediate justification view avoids the overintellectualization objection leveled against the metacognitive inferential view because it does not require any sophisticated conceptual or metacognitive capacities. Imaginings must have constraints with justificatory force to confer justification, but subjects do not need to be able to reflect on or form beliefs about this fact. The first-order constraints do all the work, rather than higher-order beliefs about those constraints.

I do not claim to have fully articulated or conclusively defended the mediate justification view. My goal has been to provide and motivate an alternative to the immediate and inferential justification views that dominate the literature on

epistemology of imagination. Exactly how plausible this alternative is, and how to develop it further, are avenues for future investigation.

2.6 Conclusion

In this chapter, I argued that imaginative justification is mediate but non-inferential. Imaginings confer justification that depends on a subject's prior justification but does not depend on a separate inference from a subject's prior beliefs. I considered two views of the structure of imaginative justification that are prevalent in the literature—the immediate justification view and the inferential justification view—and argued that they are both false. In their place, I offered up a view according to which imaginative justification depends on the justificatory force of the states that constrain the imagination. This view offers a promising way forward for future theorizing about the epistemology of imagination.

Chapter 3

How Imagination Informs

3.1 Introduction

Suppose that Daisy is wondering which of her two friends is taller: Mario or Luigi. She has never seen them stand next to each other before, and it isn't worth calling them up for such a trivial request, so she instead forms a realistic imagining of what they would look like if they were standing next to each other. Daisy finds that she imagines Luigi as taller than Mario, and therefore concludes that Luigi is in fact taller than Mario.

This seems like a paradigmatic case of learning based on the imagination. But didn't Daisy already need good evidence about how tall her friends are to form an accurate imagining of them in the first place? If this is right, then it seems like her imagination did not contribute anything new and instead merely recapitulated evidence she already has. Conversely, if Daisy genuinely didn't have any prior evidence that Luigi is taller than Mario, then on what basis did she imagine him as such? In this case, her belief looks epistemically no better than a lucky guess.

These considerations motivate the thought that the imagination is uninformative; you cannot get more out of an imagining than you put into it.[48] And this, in turn, motivates the view that the imagination is epistemically inert. The imagination cannot justify belief that you did not already possess justification for, and it cannot give you knowledge that you were not already in a position to know. This is a powerful, intuitive, and widely endorsed challenge to the epistemic power of the imagination.

In this chapter, I will argue that this challenge fails and that the imagination is robustly informative. I will also put forward a novel account of how the imagination informs that appeals to the representational format of the imagination. The core idea is that the imagination is analog and, since analog representations can represent relations "for free," this explains how the imagination can contain more information than is put into it.

The format account of how imagination informs makes important contributions to both philosophy of mind and epistemology. In philosophy of mind, it shows how the imagination can generate contents that are not supplied by any antecedent mental states. In epistemology, it shows how the imagination can generate justification that is not supplied by any antecedent evidence. The theoretical interest of the format account

[48] This concern is made more pressing by the arguments of the previous chapter. If imaginative justification is mediate, then it is natural to think that its justificatory power is exhausted by the justificatory power of one's prior evidence.

extends beyond just the context of imagination. It also illuminates the epistemic value of analog representations more generally, thereby explaining why it can be useful to reason with external, non-mental analog representations such as pictures, diagrams, and graphs.

The chapter proceeds as follows. §3.2 clarifies the claim that the imagination is informative and surveys the widespread resistance to this claim. §3.3 and §3.4 argue for the format account of how imagination informs. §3.5 responds to objections, §3.6 compares the format account to extant accounts, and §3.7 concludes.

3.2 The Charge of Uninformativeness

The claim that the imagination is uninformative is, to a rough first approximation, the claim that the imagination cannot go beyond information that one already has and thus cannot generate new justification. Versions of this claim are widely endorsed in both the historical and contemporary literatures. A natural place to start is with Sartre, who claims that "nothing can be learned from an image that is not already known," (1948 p. 12) and that since "it is impossible to find in the image anything more than what was put into it," therefore "the image teaches nothing" (1948 p. 146-7). Wittgenstein agrees, writing that "when we form an image of something we are not observing. The coming and going of the pictures is not something that happens to us. We are not surprised by

these pictures, saying 'Look!'" (1948/1980 p. 17) and that "it is just because imaging is subject to the will that it does not instruct us about the external world" (1948/1980 p. 15).[49]

The claim that the imagination is uninformative also has proponents in the contemporary literature. Casey writes that "…by imagining, we ascertain nothing that we did not know beforehand in some respect" (2000 p. 7). McGinn, after approvingly quoting the aforementioned passages from Sartre and Wittgenstein, claims that "images are not informative, while percepts are," and that the reason for this is that in perception "I am flooded with information whose causal origin is not me and my intentions but an independent objective world whose properties are being revealed to me," while in imagination, the "object of my imaging does not feed new information to me" and therefore only "contains precisely what I intended to bestow upon it" (2004 p. 18-19). Most recently, Egeland argues that "one cannot simply imagine one's way to new information about the world that isn't already somehow contained in one's prior beliefs and perceptual experiences" (2021 p. 512). On Egeland's view, imaginings "simply don't

[49] One might also look for historical antecedents of this view in Hume's copy principle: the claim that imaginings are copies of past perceptions. According to Hume, although we can use the imagination to recombine our past perceptions in new ways, we can never generate imaginings that do not ultimately recapitulate information from past perceptions. However, this is complicated by the fact that Hume thinks that by recombining our past perceptions in new ways, one can become aware of new relations between them. Thus, despite denying that the imagination is informative at the level of simple ideas, Hume seems to allow for the imagination to be informative at the level of complex ideas. In allowing that the imagination can inform with respect to the relations that hold between imaginings, Hume foreshadows an important aspect of the account I will argue for in this chapter.

provide any new information about the world," and therefore do not "confer any new justification that one didn't already have" (2021 p. 512-3).[50]

All of these theorists deny that the imagination is informative. But what does it mean to claim that the imagination is informative in the first place? These passages suggest two ways of understanding this claim that have not always been properly distinguished in the literature. The first is a purely descriptive claim about how the content of imagination relates to the content of other mental states:

> **Representational Informativeness (RI):** The imagination can represent contents that are not already represented by a subject's prior non-imaginative mental states.

RI states that the imagination can generate new contents that are not already represented elsewhere in the mind. There are different ways of denying RI corresponding to the different sorts of prior non-imaginative states that one might locate imaginative content in. For example, McGinn's claim that the imagination "contains precisely what I intended to bestow upon it," (2004 p. 18-19) suggests that imaginative contents must have already been represented in a subject's prior intentions. But one might alternatively hold that imaginative contents must have already been represented in perception, memory, or belief. All these more specific views count as denials of RI.

[50] See also Spaulding 2016 and Kinberg & Levy 2022 for other contemporary defenses of the claim that the imagination is uninformative.

The second way of understanding the claim that imagination is informative is as a normative claim about what the imagination can justify:

> **Justificatory Informativeness (JI):** The imagination can propositionally justify beliefs that are not already propositionally justified by one's prior non-imaginative evidence.

Propositional justification is the justification one has for holding a belief independently of whether one in fact holds it.[51] Thus, one could deny JI while holding that the imagination plays a role in generating doxastic justification by allowing beliefs to be properly formed on the basis of one's existing propositional justification. Egeland is a proponent of this view, arguing that the imagination allows "one to form one's beliefs on their proper justificatory basis, even though it doesn't confer any new justification that one didn't already have upon them" (2021 p. 513). Thus, denying JI does not entail that the imagination is wholly epistemically irrelevant, contrary to what Kind 2018 suggests. Nevertheless, denying JI imposes a severe constraint on the epistemic relevance of the imagination: even if the imagination can help to preserve and take advantage of prior evidence, it can never provide new evidence.

[51] One could also formulate a principle of Knowledge Informativeness which states that the imagination can ground knowledge that one was not already in a position to know. This principle is closely related to JI. I'll focus my arguments on JI, but they could be reformulated with minor modifications to support Knowledge Informativeness as well.

3.3 The Relational Fecundity of the Imagination

I will now argue that the orthodoxy canvassed in the previous section is mistaken and put forward a novel account of how the imagination informs. We can call it the *format account*, since it holds that the imagination is informative in virtue of the format in which it encodes information.

We can frame the format account as an argument:

1. The imagination is analog.

2. Analog representations are relationally fecund.

C1. So, the imagination is relationally fecund.

3. If the imagination is relationally fecund, then RI is true.

4. If the imagination is relationally fecund, then JI is true.

C2. So, RI and JI are true.

This section explicates and defends the argument for C1, the claim that imaginings are relationally fecund. As a rough first approximation, a representation is relationally fecund when its relational content comes along for free with its non-relational content. §3.3.1 explicates the notion of analog representation, §3.3.2 defends the premise that the imagination is analog, and §3.3.3 clarifies and defends the premise that analog representations are relationally fecund.

The second part of the format account will come in §3.4, where I will argue that the relational fecundity of the imagination establishes both RI and JI.

3.3.1 Analog Representation

The distinction between analog and symbolic representation is familiar from everyday life.[52] Compare a mercury thermometer to a digital thermometer. Both thermometers represent temperature, but they do so in very different ways. The mercury thermometer is analog, while the digital thermometer is symbolic. Other examples of analog representation include hand-clocks, heat maps, paintings, and audio recordings, while other examples of symbolic representation include digital clocks, astrological symbols, mathematical notation, and natural language.

Although the precise nature of analog representation is a matter of some controversy, an increasingly popular approach holds that analog representation involves a representationally relevant structural correspondence between vehicles and contents.[53] Consider again the difference between a mercury thermometer and a digital thermometer. In a mercury thermometer, the taller-than relation structuring the columns

[52] The term 'digital' is sometimes used instead of 'symbolic.' I prefer the term 'symbolic,' since on my view, a representation can be both analog, in that it involves structural correspondence, and digital, in that its vehicles and contents are discrete or non-continuous.

[53] In previous work, I have called this the "structural approach" to analog representation (Lee, Myers, and Rabin 2023). Different theories within the structural approach disagree over what sort of structure is relevant. Different options include dense structure (Goodman 1968), magnitude structure (Beck 2019, Peacocke 2019), and abstraction structure (Kulvicki 2015). Despite their differences, all of these theories are committed to the more general idea that unites the structural approach: that analog representation involves structure corresponding to structure.

of mercury corresponds to the warmer-than relation structuring the temperatures that those mercury columns represent. For example, the mercury column that represents 72° is taller than the mercury column that represents 47° and shorter than the mercury column that represents 96°. Moreover, in analog representation, the structural correspondence between vehicles and contents is representationally relevant and is not merely an accidental byproduct of how vehicles are mapped to contents. Mercury thermometers represent by mapping taller mercury columns to warmer temperatures. By contrast, there are no relations structuring the digits in the digital thermometer. The numerals '72' do not bear any representationally relevant relations to the numerals '47' or '96'. Instead, the mapping from digits to temperatures is stipulative and arbitrary. Even if there were some highly gerrymandered relations that hold between the digits and that correspond to the warmer-than relation on the contents, this structure is merely incidental; it does not do any representational work and therefore does not render the digital thermometer analog.[54]

[54] Lee, Myers, and Rabin (2023) account for the difference between representationally relevant and merely incidental structural correspondences by appealing to an intensionalist approach to interpretation functions: the idea that interpretation functions are individuated by the rules they use to map vehicles to contents, rather than mere input-output pairings. On this view, a structural correspondence is representationally relevant when the interpretation function uses that structural correspondence as a rule to map inputs to outputs. I will not assume this intensionalist approach in what follows. All I assume is that there is some way to account for the difference between representationally relevant and merely incidental structure correspondences.

Summing up, we can understand analog representation as involving a representationally relevant structural correspondence between vehicles and contents.

3.3.2 Imagination is Analog

In this section I will present three robust and mutually supporting lines of evidence that the imagination is analog in precisely the sense described in the previous section. Since this evidence has been discussed extensively in the literature, I will move through it rather quickly here.[55]

The first type of evidence is behavioral. The classic finding is due to Shepherd & Metzler 1971. In this study, subjects were presented with two different objects at different orientations and asked to determine if the objects were the same or different. Subjects answer this question by mentally rotating one object to match the orientation of the other, and then compare the shapes of the two objects. Importantly, the difference between the orientations of the two objects (i.e. the angle that one would need to be rotated to match the orientation of the other) correlated with the reaction time of the subjects. This indicates that there is a structural correspondence between the imaginative representations themselves and the objects that they represent. Angle of orientation relations between the represented objects correspond to functional relations between the imaginings that represent them, which modulate the reaction times of the subjects. In

[55] See Kosslyn 1994 and Kosslyn, Thompson, & Ganis 2006 for reviews.

another classic finding, Kosslyn 1973 and Finke and Pinker 1982 found that the time it took to "scan" an imagined picture correlated with the distance between the two points on the picture. Once again, this indicates that there is a structural correspondence between the spatial distance relations between parts of the represented object and functional relations between parts of the imagining itself. In both cases, we need to a posit a structural correspondence between the vehicles of imagining and their contents in order to explain why response times covary with environmental properties such as angle of rotation.

The second type of evidence is neuroscientific. There is evidence that the primary visual cortex is topographically organized such that activation in the visual cortex roughly preserves the geometric structure of activation on the retina (Fox et al. 1987, Sereno et al. 1995). Imagination is not caused by retinal activation. Nevertheless, the very same topographically organized areas are implicated in imagination (Klein et al. 2004, Slotnick et al. 2005). These results indicate that there is a structural correspondence between the topography of neural activation in the brain and the topography of the imagined scene during episodes of imagination. Moreover, this structural correspondence is representationally relevant. Damage to an area of this topographical structure yields a blind spot in the corresponding area of the visual field (Kastner et al. 1998), and, as Kosslyn et al. 2006 point out, "the closer two damaged regions of the

topographically organized visual cortex are, the closer in the visual field the corresponding [blind spots] will be" (p. 15). These results indicate that visual imagination involves analog representation of space.

The final sort of evidence that imagination is analog comes from introspection.[56] Consider the experience of imagining lime green, the experience of imagining teal, and the experience of imagining scarlet red. Teal is more similar to lime green with respect to hue than it is to scarlet red. Intuitively, so too is the phenomenal character of imagining teal more similar to the phenomenal character of imagining lime green (at least along one dimension of phenomenal similarity) than to the phenomenal character of imagining scarlet red. Thus, similarity relations between imaginative color experiences seem to correspond to similarity relations between the hues they represent. Similar observations apply to other properties that one can imagine. In general, imaginative experiences vary along phenomenal dimensions whose structure, as revealed by introspection, corresponds to the structure of what those dimensions represent.

None of these lines of evidence are on their own conclusive.[57] Some theorists have put forward alternative explanations of the behavioral results (Pylyshyn 2002 p. 159-165)

[56] An additional line of evidence in favor of the view that imagination is analog comes from psychophysics. Beck 2019 argues that Weber's law, a well-established psychophysical finding, indicates that perception is analog. Given the cognitive and neural overlap between perception and imagination, an analogous argument could be made in favor of the view that imagination is analog.

[57] It is compatible with each of these lines of evidence that the imagination is only partially analog. For example, it might be that mental images represent some properties, such as spatial extension and pitch, analogically but represent other contents, such as high-level contents or singular contents, symbolically.

and questioned whether the retinotopic organization of the visual cortex is relevant to the format of mental images (Pylyshyn 2002 p. 174-178), and many philosophers are skeptical of appeals to introspection in general (Schwitzgebel 2006). I do not have the space to wade into these more granular debates. Although I agree that each line of evidence is defeasible when taken on its own, taken together they strongly suggest that the imagination is at least partially analog.[58] There is a representationally relevant structural correspondence between the vehicles of imagination and their contents.

3.3.3 Analog Representations are Relationally Fecund

In this subsection, I will argue that analog representations are relationally fecund. A representation is *relationally fecund* when it explicitly represents relational information at no extra representational cost over and above the non-relational information it represents.[59] The relational fecundity of analog representation is best illustrated by example. Consider a map of the contiguous United States pinned to a corkboard in which people place pins labelled with their name to represent the state in which they live: [60]

This sort of view has recently been defended by Kung 2010, Langland-Hassan 2015, and Tooming 2018. The claim that the imagination is only partially analog is still strong enough for my purposes, insofar as it still yields an account of how the imagination can be informative.

[58] I would be satisfied if the arguments in this section established the following conditional claim: if the imagination is analog, then it is relationally fecund. This conditional claim is still interesting enough to merit consideration.

[59] In other work, I have argued that analog representations are semantically fecund, meaning that they have high expressive power relative to the complexity of their interpretation functions (Lee, Myers, and Rabin 2023). Relational fecundity is a kind of semantic fecundity. Namely, semantic fecundity with respect to relational contents.

[60] This example is inspired by examples presented in Shimojima 2015.

Figure 1 – Map with four names

This map represents that Andrew lives in Texas, Brian lives in Oregon, Chris lives in Nebraska, and David lives in Pennsylvania. Now, suppose Evan adds a pin to the map to represent that he lives in Ohio:

Figure 2 – Map with five names

Ostensibly, only a single piece of information has been added to this map. Namely, that Evan lives in Ohio. However, once the pin has been added to the map a whole host of relational information is represented as well. For example, figure 2 also represents that Evan lives in a state adjacent to the one that David lives in, that Evan lives north of Andrew, that Evan lives east of Chris and Brian, that Evan lives closer to Chris than he does to Brian, that Evan lives closer to David than to Chris, and so on. All of this information comes for free once the initial non-relational piece of information that Evan lives in Ohio is added to the map. Moreover, this information is represented explicitly. One can simply read it off the map without any intervening inference. They are not inferentially downstream from the information displayed on the map, but are instead displayed on the map themselves.

Contrast figure 2 with a symbolic representation of the same information:

> Andrew lives in Texas. Brian lives in Oregon. Chris lives in Nebraska. David lives in Pennsylvania. Evan lives in Ohio.

In this representation, none of this extra information is represented explicitly. It can only be recovered by bringing to bear lots of background knowledge about the spatial relationships between different states and then engaging in some quite complicated inferential steps. Even if we add sentences specifying the size, shape, and location of each state, and thus build this background knowledge into the initial representation, one could

still only recover the spatial relations between the different people with the help of inference. This symbolic representation does not explicitly represent relations for free. Only the analog representation is relationally fecund.[61]

Similar observations apply to other analog representations. Consider a photograph of two dogs. If the part of a photograph that represents one dog is lighter and yellower than the part of a photograph that represents another dog, then the first dog is represented as lighter and yellower than the second dog. If the part of the photograph that represents the first dog is to the left of the second dog, then the first dog is represented as to the left of the second dog. Simply by specifying the monadic color and spatial properties of each part of the photograph, one also automatically and explicitly represents the representationally relevant relations that each of those parts stand in to each other. These relations are not represented by adding some extra syntactic feature over and above the features of each individual pixel. They simply come along for free.

These examples are suggestive. But we can extract a more general argument for the thesis that analog representations are relationally fecund from the account of analog representation argued for in §3.3.1. According to that account, analog representations assign contents by relying on a structural correspondence between vehicles and contents.

[61] Relational fecundity is closely related to what Shimojima (2015) calls "free ride in inference," which is the fact that "expressing a set of information in diagrams can result in the expression of other, consequential information" (2015 p. 13). Shimojima leverages this property to develop an account of diagrammatic reasoning.

This involves taking a relation on vehicles (such as the taller-than relation) and mapping it to a relation on contents (such as the warmer-than relation). But this means that every part of the vehicle, in virtue of standing in the relevant vehicular relations to other parts of the vehicle, will automatically represent the relevant content relations between corresponding parts of the content.[62]

We can make this argument more precise by representing it in the following way:

1. Analog representations map vehicular relations R_v to content relations R_c.

2. Suppose the vehicular parts of an analog representation V_1 and V_2 represent content parts C_1 and C_2.

3. From 1 and 2, V_1 and V_2 stand in R_v to each other.

4. From 1 and 3, C_1 and C_2 are represented as standing in R_c to each other.

Premise 1 is the only substantive premise, and it merely restates the afore-mentioned account of analog representation. The upshot of the conclusion is that just by fixing the non-relational content of each part of an analog representation (as represented in premise 2), it also thereby represents the relations that hold between those parts. For example, when one adds the content that Evan lives in Ohio to the map, the vehicular part that represents Evan stands in representationally relevant relations to other parts of the

[62] Strictly speaking, relational fecundity is only a feature of multi-part analog representations. A single mercury thermometer does not exhibit relational fecundity because it only has a single part and therefore has nothing to bear a relation to. This restriction to multi-part analog representations is harmless, since most imaginings plausibly involve multiple parts.

vehicle, thereby automatically representing the corresponding relations in the content. Thus, the relational fecundity of analog representation is grounded in the fact that it involves representationally relevant structural correspondence.

The fact that analog representations are relationally fecund is independently interesting. It points to a way in which it can be useful to reason with diagrams, pictures, graphs, and other sorts of non-mental analog representations. But for our purposes, it is important because of its implications for the imagination. The imagination is relationally fecund in virtue of its analog format.

3.4 Two Types of Informativeness

Recall the overall argument for the format account:

1. Imaginings are analog representations.

2. Analog representations are relationally fecund.

C1. So, imaginings are relationally fecund.

3. If imaginings are relationally fecund, then RI is true.

4. If imaginings are relationally fecund, then JI is true.

C2. So, RI and JI are true.

So far, I have argued for the first two premises and established C1: that the imagination is relationally fecund. In this section, I will argue for premise three (in §3.4.1) and premise

four (in §3.4.2), thereby establishing the crucial connection between the relational fecundity of the imagination and its capacity to inform.

3.4.1 Representational Informativeness

Recall our earlier formulation of Representational Informativeness:

> **Representational Informativeness (RI):** The imagination can represent contents that are not already represented by a subject's prior non-imaginative states.

It is relatively straightforward to see that RI is entailed by the relational fecundity of the imagination. In short: one can begin with a set of non-relational information, represent that information via the imagination, and end up with an imagining that also represents a whole host of relational information, thereby representing relational contents that are not already represented by any prior non-imaginative states.

Consider the example that opened this chapter. Daisy is wondering which of her two friends, Mario or Luigi, is taller. She imagines them standing next to each other, thereby forming the belief that Luigi is taller than Mario. The challenge is to explain how it is possible for her to do this without already knowing that the Luigi is taller than Mario. Here is my diagnosis: prior to engaging in any imagining, Daisy has some idea of what Mario and Luigi look like on their own. She has seen each friend many times and from many different angles and thus has a good sense of how tall they are individually. But

she has not seen them standing next to each other before, and she does not have beliefs about how tall they are in a unit of measurement that makes their heights straightforwardly comparable by doing a simple mathematical inference. So, instead, she takes her perceptual memories of both friends and integrates them into a single imaginative state. Her imaginative state is formed on the basis of the non-relational information she has about each friend. But since this imaginative state represents spatial relations analogically, it automatically and at no extra cost represents the height relations between the two people. Daisy can then read the fact that Luigi is taller than Mario directly off of her imagining without any intervening inference, despite this not being part of the information on which the imagining was based.

This form of explanation generalizes to many other stock examples that are widely invoked in the literature on the epistemology of imagination. Consider the case of using your imagination to gauge whether you can fit your sofa through a doorway. You imagine trying to fit the sofa through the doorway at various angles until you imagine an angle at which it just barely fits through, thereby forming the belief that it will fit. Once again, it is plausible that you have a rough sense of the size and shape of both the sofa and the doorway. But these beliefs are not so precise that you can simply deduce whether the sofa will fit through by mathematical inference. The sofa is irregularly shaped, so to do this you would need to know how wide it is at every angle of rotation. However, by

forming an imaginative representation of both objects that is based on your information about each of their individual sizes and shapes, you can thereby form a representation of the relations that hold between them at no extra cost. As you imagine rotating the sofa, your imagining is also automatically representing whether the doorway is wider than the sofa at that angle. Thus, your imagining can represent the doorway as being wider than the sofa at a certain angle and therefore that the sofa will fit through the doorway without this being part of your initial information.

The examples we have considered so far are all visual in modality. But the format account extends to the non-visual sensory modalities as well. If I am wondering which of two ingredients is sweeter, I might imagine both of their flavors and then compare the resulting experiences to arrive at a judgment. The format account predicts that all I need to do is input my information about the flavor of each ingredient and the resulting imagining will automatically represent one as sweeter than the other in virtue of its analog format. Similarly, if I am wondering which of two birdsongs is higher in pitch, I might imagine both. If I constrain my imagining with my information about each birdsong, then my imagining will automatically represent one as higher pitched than the other. In all of the cases of imagination that we have discussed, the format account offers a simple and intuitive explanation of how the imagination can represent more information than is put into it.

I conclude that RI is true. The content of the imagination can outstrip the content of the prior non-imaginative states on which it is based.

3.4.2 Justificatory Informativeness

I now turn to arguing that the relational fecundity of the imagination entails that Justificatory Informativeness is true. Recall our earlier formulation of Justificatory Informativeness:

> **Justificatory Informativeness (JI):** The imagination can propositionally justify beliefs that are not already propositionally justified by one's prior non-imaginative evidence.

At first glance, it might appear that JI follows from RI; if the imagination can represent more content than is represented by one's prior non-imaginative evidence, then it must be able to confer more justification than one's prior non-imaginative evidence. However, things are not so simple. One might object that the imagination can represent new contents but nevertheless hold that it cannot generate new justification. It could be that the imagination can only generate contents that were already justified by a subject's prior non-imaginative evidence. For example, even if Daisy does not antecedently represent the content that Luigi is taller than Mario, it is plausible that this piece of information must have been entailed by her prior beliefs and memories about the heights

of each person and thus that she already had propositional justification for believing it. More generally, the relational fecundity of the imagination does not generate relational contents from thin air. Instead, the relational contents generated by the imagination will be entailed by the non-relational information that one inputs into the imagination. Thus, one might object that the imagination can represent new information, but it cannot generate new justification.

An analogy between imagination and inference is helpful for pointing the way towards a response. Both imagining and inferring involve transitioning from an initial set of information to a conclusion whose content differs from the initial state.[63] For example, in modus ponens inference the content *q* is not explicitly represented by the premises *p* and *if p then q,* and in Daisy's imagining the content that Luigi is taller than Mario is not explicitly represented in her prior information about them

Although all inferences generate new content, only some inferences generate new justification. Contrast a simple modus ponens inference with a complex chain of mathematical reasoning. It is plausible that simple modus ponens reasoning does not generate justification over and above the justification one had for believing the premises. If one has justification for believing that *p* and *if p then q,* then one already has justification for believing that *q* prior to undergoing any inference. By contrast, one does not possess

[63] Balcerak Jackson & Balcerak Jackson (2013) argue that a content gap between premises and conclusion is a hallmark of reasoning that applies to both inference and imaginative simulation.

justification for believing a complex mathematical theorem just in virtue of having some relatively basic justified mathematical beliefs. Even though the theorem is entailed by one's beliefs, if one formed a belief in the complex theorem on the basis of those beliefs, it would be, epistemically speaking, no better than a lucky guess. Since a belief is doxastically justified when it is based on adequate propositional justification, and since a belief in the theorem would not be doxastically justified when based on a belief in the premises, then the premises do not propositionally justify the belief in the theorem. Only after one goes through the process of inferring the theorem from the premises is one able to recognize that the theorem is entailed by their prior beliefs and therefore get propositional justification for believing that it is true.[64]

We can analyze the difference between these two cases in terms of whether they involve a *basic transition* between contents. Modus ponens is a basic transition, while the relation between one's naïve mathematical beliefs and the complex mathematical theorem is a non-basic transition. Exactly how to characterize basic transitions is a matter of some controversy. Roughly, we can say that a transition between contents is basic when the agent has the ability to recognize that the conclusion is entailed by the premises

[64] Some hold that propositional justification is just a logical relation between contents and thus that one has propositional justification for believing all of the contents that are entailed by one's prior justified beliefs. There are two things to say in response. First, propositional justification is fundamentally a normative relation while logical entailment is not (Harman 1984). Second, even if I grant that propositional justification is a matter of logical entailment, I can reframe my arguments in terms of doxastic justification. The claim that imagination can generate doxastic justification in virtue of its relational fecundity is still a substantive and interesting thesis.

on the basis of the premises alone.[65] While one can recognize that *q* follows from *p* and *if p then q* simply in virtue of understanding the premises, one is not able to recognize how the complex mathematical theorem follows from their naïve mathematical beliefs. This makes an epistemic difference. When one is already able to recognize that a conclusion follows from some premises, it is plausible that one already has inferential justification for believing that conclusion, even prior to carrying out the inference. But when one is not able to recognize that the conclusion follows from the premises, then it is plausible that they only get justification for believing the conclusion after carrying out the inference and thereby coming to recognize that the conclusion follows. This delivers the intuitive verdict that simple modus ponens does not generate new justification while the complex mathematical reasoning does.

I concede that there are cases in which forming beliefs based on the imagination involves only a basic transition and therefore does not generate justification. Suppose that Daisy imagines Mario and Luigi standing next to each other despite antecedently knowing both of their heights in centimeters. This is a basic transition because she is already able to recognize that one friend is taller than the other even prior to carrying out

[65] This formulation is compatible with many views of basic transitions, insofar as "ability to recognize" is a placeholder in need of analysis. Available options include a conceptualist analysis (Boghossian 2003), dispositional analysis (Wedgwood 2007), intuitionist analysis (Dogramaci 2013), and pragmatic analysis (Schechter 2019). My arguments are ultimately compatible with any of these accounts, as long as one grants that there is *some* difference between basic and non-basic transitions that explains why only the latter generate new justification.

the imaginative exercise. In this case, it is plausible that she already has justification for believing that one is taller than the other and thus that her imagining does not contribute any new justification.

However, to establish the truth of JI, we only need one case in which forming a belief on the basis of the imagination involves a non-basic transition and thus generates new justification. Consider instead the original version of the case in which Daisy does not know the heights of her friends in centimeters and instead all she has is a set of perceptual memories of seeing each of them standing from various angles. In this case, she may simply not be able to recognize that one friend is taller than the other prior to carrying out the imaginative exercise. Like the case of inferring the complex mathematical theorem, directly basing a belief that one friend is taller than the other on her individual memories of each friend would be no better than a lucky guess insofar as those memories alone do not make it transparent to her which friend is taller (even if they in fact support an answer to this question). This, I submit, is a case in which the imagination bridges a non-basic transition between premises and conclusion and therefore generates new justification.

The thesis that imaginings can generate justification becomes even more plausible once we move to examples in which the inferential connections between premises and conclusion are even more complex. Consider figure 2 from §3.3.3—the map that

represents where people live. Suppose that instead of using an external map, you instead imagine a map of the United States with markers indicating where different people live. Once you learn that Evan lives in Ohio, you imagine placing a marker referring to Evan in the corresponding region. From there, you can simply "see with your mind's eye" all the spatial relations that hold between Evan and the other people. Before carrying out this imaginative exercise, it is highly implausible that you would already be able to recognize all of the potentially quite fine-grained spatial relationships that hold between the various people. For example, you might simply be unable to recognize that there are fewer states in between Chris and Brian than there are in between Chris and Evan until after you go through the process of imagining the map. Even if your prior non-imaginative information about where each person lives entails this fact, only after imagining the map are you able to recognize this fact and therefore get propositional justification for forming the relevant belief.

Here is one more example to drive the point home. Suppose you are wondering how many regions are formed by drawing lines that connect four points on the perimeter of a circle to each other. Unless you have memorized the function that takes as input the number of points and outputs the number of regions and are particularly good at mental computation, then you will probably not be able to non-imaginatively infer the answer to this question. (If you are doubtful, stop reading and take a moment to try to answer

this question yourself without engaging in any visual imagination or looking at Figure 3 on the following page.) The premise that there are lines connecting four points on the perimeter of a circle does not on its own give you the ability to recognize how many regions are formed. It is a non-basic transition. This correctly predicts the intuitive judgment that you do not yet possess justification for believing that eight regions will be formed simply in virtue of having justification for believing the premise. However, the answer that eight regions are formed is easy to arrive at by imagining a circle with lines connecting four points on its perimeter and counting the resulting number of regions formed in your imagining. Even though your prior non-imaginative information entails that eight regions will be formed, only after carrying out the imaginative exercise do you get propositional justification for forming this belief. This is because the imagining represents relations that hold between the lines that are entailed but not represented by your initial set of information. Therefore, this is a case in which the imagination generates new justification.

I have argued that imaginings can generate new justification when they bridge a non-basic transition. I have also argued that several examples meet this condition. At the very least, this argument shifts the burden back on to the opponent of JI to supply us with a reason why the imagination cannot, as a matter of principle, bridge a non-basic transition. Since the relational fecundity of the imagination ensures that the imagination

can represent contents that are inferentially downstream from the information one starts with, I suspect that no such reason is forthcoming. I conclude that JI is true.

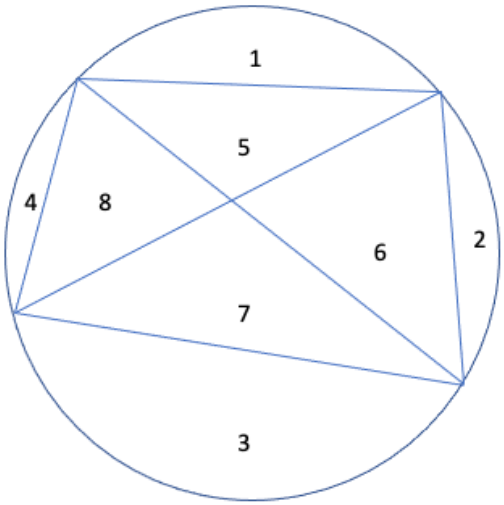

Figure 3 – Circle with Lines Connecting Four Points on Perimeter

3.5 Objections

In this section, I turn to responding to objections to RI and JI. As we have already seen, many theorists have held that the imagination is uninformative. We can distinguish between three different arguments for this claim that have appeared in the literature and have motivated many theorists to hold this view. As we will see, each of these arguments has both a descriptive and normative interpretation and thus could be taken to undermine either RI or JI. I will argue that the format account puts us in a position to respond to each of these objections.

We can call the first argument the *argument from sensory reception*:

1. The imagination does not involve sensory reception.
2. If a state or process does not involve sensory reception, then it is not informative.
3. So, the imagination is not informative.

This argument is suggested by Wittgenstein's claim that "when we form an image of something we are not observing," (1948/1980) and McGinn's claim that the "object of my imaging does not feed new information to me as I image it" (2004 p. 18). The notion of 'sensory reception' at issue here is just the transduction of information by means of stimulation of the sense organs. The first premise is motivated by the fact that we distinguish imagination from perception precisely in virtue of the fact that perception is caused by sensory stimulation while imagination is endogenously caused.[66] The second premise is motivated by the idea that sensory reception is the only way for the external world to causally impinge on our mind and therefore give us new information. Together, these premises entail that the imagination is uninformative. This argument can be interpreted in both a descriptive and a normative sense. One might think that sensory reception is the only way to represent new contents, which undermines RI, or that sensory reception is the only way to yield new justification, which undermines JI.

Premise 2 is the obvious place to push back against the argument from sensory reception. We have already seen that garden-variety inference can generate new content

[66] Nanay defines mental imagery (i.e. imagistic imagination) as "perceptual processing not triggered by corresponding sensory stimulation" (2018 p. 127).

and, when the inferential transition is non-basic, new justification without involving sensory reception. But more importantly, the imagination can also represent new contents, not by transducing new information from one's environment, but instead by integrating information one already has into an analog representation, thereby representing relations between that information that were not previously represented. And it can generate new justification in cases where one was not already able to non-imaginatively recognize that those relations were entailed by one's prior information. Thus, premise 2 of the argument from sensory reception is false.

We can call the second argument the *argument from voluntary control*:[67]

1. The imagination is under one's voluntary control.
2. If a state or process is under one's voluntary control, then it is not informative.
3. So, the imagination is not informative.

This argument is suggested by Sartre's claim that "it is impossible to find in the image anything more than what was put into it,"(1948 p. 146) Wittgenstein's claim that "it is just because imaging is subject to the will that it does not instruct us about the external world," (1948/1980 p. 15) and McGinn's claim that "I no more learn from images than I

[67] Note that this argument differs from the argument from voluntary control presented in chapter 1. The argument in chapter 1 was for the conclusion that the imagination cannot justify empirical belief, whereas the present argument is for the conclusion that the imagination is not informative. These conclusions are importantly different. One can accept the latter while denying the former. Nevertheless, I have given them the same name since they share the same structure and motivations.

learn from the sentences I write down, since in both cases I merely express my antecedent intention" (2004 p. 18). In this context, we can understand voluntary control as the property of being the direct causal product of one's intentions. The first premise is motivated by first-personal reflection on one's own imaginings. Typically, we have voluntary control over what we imagine. Imagining is something we do rather than something that happens to us. Once again, the second premise can be interpreted in a descriptive or normative sense. The descriptive sense is motivated by the thought that if imagination is under voluntary control, then it is merely expressing the content of our intentions rather than generating new content. This undermines RI since it holds imaginative content must have already been represented in one's intentions. The normative sense is motivated by the thought that states or processes that are under voluntary control cannot generate new justification. One can imagine anything one wants to, and imagination is therefore not a reliable guide to what the world is like. This interpretation gives us an argument against JI.

However, premise 1 of the argument from voluntary control stands in need of an important qualification. While it is certainly true that *some* of the imagination's content is intentionally chosen, the relational fecundity of the imagination points to a sense in which not *all* of its content is intentionally chosen. Daisy can intentionally choose to imagine two friends standing next to each other and, as a result, come to unintentionally imagine

that one is taller than the other. More generally, one can intentionally imagine some non-relational content and, as a result, come to *unintentionally* imagine some relational content. It is precisely this unintentional relational content that is generated anew by the imagination and that allows the imagination to justify beliefs that were not already justified for the subject.[68]

We can call the third argument the *argument from constraints:*

1. Imaginings with justificatory force are constrained.
2. If a state or process is constrained, then it is not informative.
3. Imaginings with justificatory force are uninformative

We can say that a state or process is constrained when its content is determined by the content of some other mental state or states. I argued for premise 1 in the previous chapter, so I will keep the present discussion brief. To motivate this premise, consider the example that we started with. In order to figure out whether Mario or Luigi is taller, Daisy can't just imagine them as any height she wants to. That is, her imagining of their heights cannot be completely unconstrained. Instead, she needs to constrain her imagination with her antecedent information about how tall they are, such as her beliefs and perceptual memories. But now the second premise kicks in: if she already has antecedent

[68] While other theorists have denied the first premise of the argument from voluntary control (e.g. Langland-Hassan 2016, Williamson 2016, Balcerak Jackson 2018), they have typically done so for different reasons. No one has argued that some imaginative contents are involuntary in virtue of the format of the imagination.

information about how tall they are, then it is not clear that the imagination contributes anything new. Once again, the second premise has both a descriptive and normative reading. On the descriptive reading, constrained imaginings are not able to represent contents that are not already represented by their constraints, thereby undermining RI. On the normative reading, constrained imaginings are not able to justify beliefs that are not already justified by their constraints, thereby undermining JI.

I agree that the imagination must be constrained in order to have justificatory force. But we have already seen that the imagination can go beyond both the content and justificatory force of the mental states it is constrained by. For example, Daisy's imagining must be constrained by good evidence about the heights of Mario and Luigi to justify a belief that one is taller than the other. Nevertheless, the imagination can go beyond the content of those constraints by representing relational information that is supported by but not explicitly contained in that evidence. And the imagination can confer more justification than the constraints alone by giving subjects the ability to recognize what follows from them. This underscores an important but underappreciated point: imaginative justification can be both mediate, in that it partially depends on a subject's prior justification, *and* generative, in that it can go beyond a subject's prior justification. Thus, premise 2 of the argument from constraints is false.

3.6 Extant Accounts

The format account is a novel account of how the imagination informs. But it is not the first account to be proposed. In this section, I want to briefly canvas two existing views and show how the format account improves upon them.

3.6.1 The Argument from Computer Simulations

A useful place to start is with Kind (2018), who is one of the first to explicitly argue that the imagination can be informative.[69] Kind's argument is relatively quick and proceeds by way of an analogy between imagination and computer simulation.[70] Kind claims that "a computer simulation contains only the facts that are put into it, but it can nonetheless provide us with information about the world" (2018 p. 241). As evidence, Kind points to the fact that "computer simulations have become ubiquitous in both science and social science, and they are generally considered to be a critical part of the scientific enterprise" (2018 p. 236). Kind then argues that imaginings are analogous to computer simulations. While computer simulations are simulations that one runs on some hardware, imaginings are simulations that one runs in one's head. If computer simulations are informative, then so too are imaginings.[71]

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[69] See Taylor 1981 for an earlier discussion.

[70] Kind also proposes a number of additional analogies to bolster her argument. For example: "A baker can be provided with new information once she tastes her newly baked cake, even though the cake contains nothing but what she put in it." (2018 p. 242). I'll set this aside and focus on the analogy with computer simulations, since this is the analogy that Kind develops in the most detail and in my view presents the strongest case for the informativeness of the imagination.

[71] The argument from computer simulations presented here is closely related to but distinct from the argument of the same name presented in chapter 1. While the previous argument was for the conclusion that imaginings can justify empirical beliefs, the present argument is for the conclusion that imaginings are

I am sympathetic to the argument from computer simulations. I agree with Kind that computer simulations can be informative and that imaginings are in many ways relevantly analogous to computer simulations. However, taken on its own, this argument is not wholly satisfactory. A full defense of the informativeness of the imagination should, in addition to establishing *that* imaginings are informative, explain *why* imaginings are informative. Although Kind likens the imagination to computer simulation, she does not give an account of how either is able to generate new information. Indeed, Kind's argument from computer simulation is compatible with the format account, insofar as the format account in principle has the resources to explain how both imaginings *and* many computer simulations are informative.[72]

3.6.2 The Architectural Account

Several theorists have put forward an *architectural account* of how imagination informs. The architectural account appeals to the cognitive architecture of the imagination, rather than its representational format, to explain how the imagination informs. The basic idea behind the architectural account is that the imagination has access to a store of information that other person-level cognitive systems cannot access, and this

informative. One can accept the former conclusion while denying the latter. Nevertheless, I have given both arguments the same name to highlight their similar structure and motivations.

[72] An alternative line of response, pursued by Kinberg & Levy 2022 and heavily implied by Egeland 2021, is to simply deny that computer simulations are informative in the relevant sense. Since a state or process can be uninformative while still playing a role in generating doxastic justification, one could agree with Kind that computer simulations play an epistemic role in scientific practice while denying that they generate new propositional justification.

explains how imagination can come to represent new information that one could not have arrived at in any other way.

Langland-Hassan (2016) and Williams (2021) develop the architectural account in the most detail.[73] Langland-Hassan argues that imaginings develop according to a "forward model" whose role it is to generate predictions of incoming sensory input given certain motor commands. These predictions "are grounded in learned perceptual regularities and contingencies" (2016 p. 70) and they constitute an "imaginative 'algorithm' that constrains the development of subsequent stages in the imagining, after an initial "top-down" intention starts the process by determining the content of the first state in the sequence" (2016 p. 71). Williams (2021) expands on this account, arguing that we should understand imaginings as relying on the more general notion of a perceptual generative model that encodes environmental regularities.[74] For example, suppose you use your imagination to figure out which direction a basketball will move in once it bounces. The architectural account holds that the imagination can draw on a stored perceptual model of the physics of your environment to represent which direction the

[73] See also Shea 2022.

[74] This notion is more general because it does not make predictions specifically about motor commands, but instead about all kinds of environmental regularities. Langland-Hassan 2016 is aware of this limitation of his account and expresses openness about expanding it in this way.

ball will bounce even though you do not have a propositionally available and fully articulated theory of physics.[75]

The appeal to perceptual models on its own does not yet establish that the imaginative is informative in the sense relevant to RI and JI. This is because the environmental regularities encoded in these models are, in an important sense, information that one already has. So, merely appealing to perceptual models does not yet show that the imagination represents *new* information.

Proponents of the architectural account are often less than explicit about how to respond to this challenge. We can distinguish between two broad strategies that are available. The first holds that the information in perceptual models is not represented at all and is only implicitly built into the functional architecture of the system.[76] This is very briefly suggested by Langland-Hassan himself when he suggests that the information in the forward model may not be "explicitly represented at all" (2016 p. 70) and by Shea, who says that it "may be implicit in processing dispositions" (2022 p. 2).[77] If this suggestion is on the right track, then imaginings can explicitly represent information that was implicit in the functional architecture of the system but not part of the content of any

[75] This is corroborated by empirical accounts of imaginative simulations that appeal to generative models to explain intuitive physical judgments (e.g. Battaglia et al. 2013, Hamrick et al. 2016).

[76] See Johnson 2020 for further discussion of what she calls "representationally implicit" or "merely encoded" content.

[77] See also previous work where I have suggested that the information that governs how imaginings develop may be merely "implicitly built into the functioning of the system involved in imaginatively simulating physical systems" (Myers 2021b p. 114).

pre-existing representational state, thereby supporting RI. However, this suggestion is highly speculative. As far as I am aware, we have no evidence that bears on whether the perceptual models that constrain how imaginings unfold are explicitly represented or merely implicitly built into the functional architecture. It is an open empirical question whether the architectural account ultimately vindicates RI. This is an important limitation of the architectural account.

The second strategy is, in my view, more promising. It holds that the information in the forward model, even if it is explicitly represented, is not accessible except through the imagination. This is because the information in perceptual models is stored in the perceptual system itself and therefore is not accessible except by running one's perceptual system offline in imagination. The crucial move is to then claim that because this information is only accessible through the imagination, it does not count as part of one's prior non-imaginative evidence. Only when information is accessible to personal-level cognition can it play a justificatory role. Many theorists have made versions of this response. Gendler argues that the imagination has access to "unarticulated knowledge of the world" that is not "propositionally available" (1998 p. 415). Similarly, Aronowitz and Lambrozo hold that the epistemic role of the imagination is that it "makes information

available to a system in a new way" (2020 p. 15).[78] This response targets JI, insofar as it concedes that the imagination recapitulates contents that are already represented in perceptual models, but holds that only when those contents are represented in imagination do they play a justificatory role. However, this account relies on a substantive internalist assumption on justification: that justification must be accessible to personal-level cognition. This access requirement on justification is popular but not uncontroversial, and it will make the second strategy unpalatable for those inclined towards externalism about epistemic justification.

As with the argument from computer simulations, I am broadly sympathetic to the architectural account.[79] I think it points to a genuine way for the imagination to inform. However, I do not see it as a rival to the format account. According to the architectural account, the imagination is informative because it has access to a store of perceptual information that other cognitive systems do not. It is silent on the format that this information is encoded in. According to the format account, the imagination is informative because it takes information as input and then encodes it in a format that represents extra information for free. It is silent on where those inputs come from and

[78] See also previous work in which I have argued that "the imagination, in virtue of being housed in the perceptual system, plausibly has access to modular information that other systems cannot *as a matter of principle* access" (Myers 2021b p.115, emphasis in original).
[79] Indeed, I invoked the architectural account in Chapter 2 in the process of arguing against the first-order inferential view of imaginative justification.

whether they are also accessible by other cognitive systems. Since each account is agnostic on whether the imagination has the property postulated by other, in principle both accounts could be true. The imagination might be informative in more ways than one.

However, there is reason to think that even if the architectural account is true, it is at best only a partial explanation of how the imagination informs. First, as we already saw, the architectural account is subject to important dialectical limitations. The strategy for establishing RI relies on speculative empirical claims that we are not currently in a position to assess, and the strategy for establishing JI relies on substantive internalist assumptions about epistemic justification. Second, and more importantly, the architectural account is not fully extensionally adequate. It hinges on the idea that the imagination has access to stored perceptual information about environmental regularities. Thus, the architectural account will be best suited to explaining how the imagination can be informative with respect to how causal processes unfold in our environment. But consider the example we started with of Daisy imagining Mario and Luigi to figure out who is taller. Nothing about this imaginative project requires an implicit grasp of environmental regularities. Indeed, the imaginative project simply involves a static image of two people and therefore does not draw on any information about dynamic causal processes. The architectural account does not have the resources to explain how this imaginative project is informative, leaving room for the format

account to pull its explanatory weight. The format account is not similarly limited. It has the resources to explain how both static and dynamic imaginings can be informative, insofar as both kinds of imaginative projects are relationally fecund. As a result, we have explanatory reasons to posit the format account that are not similarly explained by the architectural account.

3.7 Conclusion

I have argued for the format account of how the imagination informs. The format account holds that the imagination is analog and that analog representations are informative because they are relationally fecund. I showed how this account establishes that the imagination can go beyond both the content and the justificatory force of one's prior mental states, thereby establishing how the format account contributes to both the philosophy of mind and epistemology of the imagination.

The format account suggests that imagination is best thought of as a distinctive form of ampliative reasoning. Imagination is a form of reasoning insofar as it depends on information that one already has. But it is ampliative insofar as it outputs more information than one puts into it. This theory offers a simple but powerful explanation of how the imagination informs.

Chapter 4

Imaginative Beliefs

4.1 Introduction

Imagination and belief are often contrasted with each other. To believe that *p* is to endorse *p*, to have a cognitive commitment that *p*, to represent *p* as true. To imagine that *p*, on the other hand, need not involve any endorsement of *p* or commitment to *p* being true. We often form imaginings that we explicitly judge to be false, and indeed we often engage in imaginative projects precisely *because* they represent scenarios that we do not believe to be true. For this reason, it has seemed obvious to most that beliefs cannot be imaginings and imaginings cannot be beliefs; they are fundamentally different kinds of mental states.

In this chapter, I want to suggest that this intuitive contrast between imagination and belief is too hastily drawn. Sometimes imagining just *is* a way of believing. More precisely, there is a robust class of imaginings that involve taking the attitude of belief towards their contents. Call these *imaginative beliefs*. I will advance two distinct arguments for this thesis: the functional argument and the epistemic argument. The core idea behind these arguments is that there are imaginings that play both the functional and epistemic

roles of belief, and that this gives us both descriptive and normative grounds for positing imaginative beliefs.

Imaginative beliefs have important implications for theorizing about the nature and epistemology of both imagination and belief. They pose a challenge for standard taxonomies of the mind, clarify the sense in which imagining is occurrent and voluntary, undermine a popular theory of the nature of the imagination, and suggest that there is a deep but underappreciated symmetry between imagistic and non-imagistic thought. Most importantly for the broader project of the dissertation, they explain the epistemic significance and justificatory force of the imagination. The epistemic role of the imagination is to be assimilated and explained by the epistemic role of belief. Over the course of this chapter, I will explore these implications and make a case for the theoretical significance of imaginative beliefs.

The chapter proceeds as follows. §4.2 gives important background on imagination and belief. §4.3 advances the functional argument for imaginative beliefs. §4.4 advances the epistemic argument for imaginative beliefs. §4.5 responds to the objection that we only need to posit distinct imaginative and doxastic states instead of a single state that is both imaginative and doxastic. §4.6 argues that imaginative beliefs pose a challenge for recreativism, a popular theory of the imagination.

4.2 Imagination and Belief

We can model intentional mental states as compounds of *content*, *format,* and *attitude*. *Contents* are the truth or accuracy conditions of a representation. They are the information that is expressed or conveyed by a representation. *Formats* are the different ways that contents can be encoded by representational vehicles. For example, photographs and sentences encode their content in very different ways and thus instantiate different formats—the former is imagistic, and the latter is discursive. Finally, *attitudes* are ways of regarding a content, or the "stances" that mental states take towards their content.[80] They correspond to clusters of functional roles that mental states typically play, and their associated success conditions. Believing a content, desiring a content, and supposing a content are all different ways of regarding a content that correspond to different functional roles in the mind and are therefore different attitudes.

Content, format, and attitude can all vary independently of each other. The dissociation between content and attitude should be highly familiar. A belief that p and a belief that q have different contents despite sharing their attitude, and a belief that p and a desire that p have the same content despite differing in their attitude. Less familiar but no less important is the dissociation between format on one hand and content and attitude on the other. Consider the belief that it is warm right now. This belief could have

[80] Attitudes are sometimes glossed as "ways of representing" (e.g. Sinhababu 2013) or "modes of representing" (e.g. Arcangeli 2020) a content. I find these formulations to be ambiguous insofar as formats, despite not being attitudes, are also ways or modes of representing contents. In my opinion, the "ways of regarding" formulation of attitudes does not suffer from the same ambiguity.

a discursive format that encodes its content via concepts like WARM and NOW, or it could have an analog format that uses greater values along some physical magnitude in the brain to represent warmer temperatures (analogous to a mercury thermometer). Thus, we can hold content and attitude fixed while varying the format properties of a mental state.[81]

Different psychological kinds correspond to different components of the format-content-attitude distinction. Locating belief and imagination in this landscape will help to clarify the thesis that there are imaginative beliefs.

Beliefs are a paradigmatic example of an attitudinal kind. Believing is a way of regarding a content. Namely, regarding a content as true. While the exact nature of belief is a matter of extensive controversy, virtually no one denies that it is an attitude. As evidence, consider the fact that belief seems to depend essentially on its functional roles. A belief that p which does not cause the subject to reason with p as a premise or behave as if p is true is arguably not a belief at all. Moreover, it is plausible that many other sorts of mental states share similar formats and contents with beliefs. For example, a belief that

[81] Format also varies independently of representational vehicle. In other words, the very same physical object can be used to encode content in different ways. For example, the very same pattern of raised dots may either be used as an iconic representation of a mountain range or to discursively represent in Braille. See Lee, Myers, and Rabin 2023 for further discussion of the dissociation between format, content, and vehicle.

p and a desire that p represent the same content and can plausibly do so with the same type of format. So, the difference between the two must be attitudinal.

By contrast, the English term 'imagination' does not correspond neatly to any one component of the format-content-attitude distinction. Imagination, it is commonly observed, is a heterogenous category (Kind 2013).

Within the philosophical literature, 'imagination' is often used to refer to two different types of mental states.[82] The first is an attitudinal kind. Call this *attitude imagining.* While beliefs have a mind-to-world direction of fit and desires have a world-to-mind direction of fit, attitude imaginings are typically thought of as directionless and thus as lacking intrinsic success conditions.[83] Supposing, entertaining, and assuming are plausibly all species of, or are at least closely related to, attitude imagination. Exactly how to characterize the functional roles of attitude imaginings is controversial. But it is commonly thought that they are "quarantined" or "disengaged" from online reasoning and action (Currie & Ravenscroft 2002, Nichols & Stich 2003). While believing that p typically causes one to reason and act as if p is true, merely attitude imagining that p is disconnected from belief-formation and action-guidance.

[82] This distinction, as well as the terminology I use to mark it, is borrowed from Van Leeuwen 2013 and Langland-Hassan 2020.
[83] A different account of attitude imagining holds that it represents its contents as possible (Yablo 1993).

The second use of imagination corresponds to a format kind. Call this *imagistic imagining*.[84] Imagistic imaginings are any mental state that has an iconic, or image-like, format.[85] The sense of "iconic" at issue here is not limited to the visual modality but also includes mental images in other sensory modalities. While the definition of imagistic imagination in terms of iconic format may make it sound like an esoteric phenomenon, imagistic imagination is a relatively common-sense psychological kind.[86] Imagistic imagining is just what we do when we think in pictures (as opposed to words).[87] Examples of imagistic imagining include forming a visual image of a galloping horse or imagining the taste of grilled broccoli.

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[84] Some theorists, such as Arcangeli 2020, define imagistic imagination as a content kind rather than a format kind. Here is a counterexample. I could invent a new concept and stipulate that it has the same content as my mental image of a cat. The concept does not thereby become an imagistic imagining. After all, I can token the concept in the absence of any mental imagery. Thus, imagistic imagination is marked by the format in which it encodes its content, rather than by the content itself.

[85] In chapter 3, I argued that imagination is analog in format. Plausibly, iconic representations are a species of analog representations (Lee, Myers, and Rabin ms), although nothing I say in this chapter hinges on that.

[86] While I define imagistic imagination in terms of its imagistic format, Langland-Hassan 2020 defines imagistic imagination in terms of its "apparently" image-like format, where this is cashed out as "the kind (or kinds) of mental state or process that, when people are aware of having it and reflect on its nature, is typically described as image-like…" (Langland-Hassan 2020 p. 57). I prefer my definition for several reasons. First, I am skeptical that people have stable dispositions regarding how they describe the format of their mental images. Second, I do not wish to take a stand on whether the format of a mental state is the kind of thing that is accessible by first-person reflection alone. Third, I think that there is empirical evidence that imagistic imagination is *actually* imagistic rather than merely apparently imagistic. For an extensive review of the evidence that mental imagery has an imagistic format, see Kosslyn, Thompson, & Ganis 2006.

[87] The terms 'perceptual imagination' or 'sensory imagination' are sometimes (but not always) used to pick out what I mean by 'imagistic imagination'. However, 'sensory' and 'perceptual' imagination are often defined in terms of their sensory or perceptual phenomenal character, while my definition of imagistic imagination does not take any stand on the nature of its phenomenal character, or even whether it needs to be conscious at all.

The fact that belief is an attitudinal kind while imagistic imagination is a format kind opens up conceptual space for the thesis that imagistic imaginings are beliefs.[88] It is a contradiction to say that some attitude imaginings are beliefs. This would require the same state to be associated with two different and mutually incompatible sets of functional roles and directions of fit. By contrast, it is not contradictory for imagistic imaginings to be beliefs. Imagistic format does not entail anything about the functional role or direction of fit of a state that would preclude it from being a belief. Just because it is possible for imagistic imaginings to be beliefs does not mean that it is true. It could be the case, as an empirical rather than conceptual matter, that the functional profile and direction of fit of imagistic imaginings are incompatible with the attitude of belief.[89]

Over the course of the rest of this chapter, I will argue for the existence of imaginative beliefs: states that are imagistic in format and doxastic in attitude. Before moving on, let me briefly distinguish this thesis from two similar views that have recently been proposed in the literature.

Stein (2021) argues that there are imaginings that "involve a kind of commitment to things' being a certain way" (p. 9417) and thus have a mind-to-world direction of fit.

[88] In chapter 1, I contrasted imagistic imagination with propositional imagination. However, one should not confuse propositional imagination with attitude imagination. Propositional imagination is imagination that does not involve mental imagery. Attitude imagination, by contrast, can either involve mental imagery or not. In other words, propositional imagination is the complement of imagistic imagination, while attitude imagination is orthogonal to this distinction.

[89] I'll consider and reject a view of this nature in §4.6.

He calls these states "imaginative expectations". However, Stein explicitly denies that imaginative expectations are beliefs—on his view they are vaguer, less explicit, and more sporadic than belief. While I agree with Stein that some imaginings have a mind-to-world direction of fit, I will go further and argue that these imaginings just are beliefs in the familiar, everyday sense. This has the advantage of accommodating the same phenomena without cluttering our mental ontology with a new, *sui generis* attitude.

Langland-Hassan (2015, 2020) argues for the existence of what he calls "judgment imaginings." Judgments are occurrent beliefs, and thus judgment imaginings are imaginings that are occurrent beliefs. Although we both argue for the existence of imagistic imaginings, there are there are several important differences between our views. First, there are substantive differences between Langland-Hassan's judgment imaginings and my imaginative beliefs. While Langland-Hassan's judgment imaginings are essentially occurrent, I will argue in §4.3 that dispositions to imagine can constitute non-occurrent imaginative beliefs. Additionally, on Langland-Hassan's view, imagistic imaginings must be supplemented by a distinct non-imagistic component in order to be beliefs. By contrast, I will argue in §4.5 that imagistic imaginings alone can be beliefs, without the need for any additional non-imagistic component.

Second, there are dialectical differences between how our arguments are structured and what conclusions can be drawn from them. Langland-Hassan's argument

for the existence of judgment imaginings hinges on intuitions about the correctness conditions of certain imaginings. To borrow one of his examples, suppose you are trying to imagine what the Arc de Triomphe looks like (Langland-Hassan 2015). You form an imagistic imagining of a big stone arch. Intuitively, this imagining is correct just in case it accurately represents what the Arc de Triomphe looks like. Since this imagining has a mind-to-world direction of fit, Langland-Hassan concludes that it is a belief.

While I am sympathetic to this conclusion, I do not think that Langland-Hassan's argument successfully establishes it. We can represent the argument in the following way:

1. There are imaginings with a mind-to-world direction of fit.
2. If a state has a mind-to-world direction of fit, then it is a belief.
3. So, there are imaginings that are beliefs.

This argument has several limitations. Most importantly, premise 2 of this argument is false. There are many states that have a mind-to-world direction of fit but are not beliefs. As examples, consider perceptual experiences, episodic memories, guesses, and hypotheses.[90] Indeed, as we just saw, there are some, like Stein 2021, who agree that imaginings can have a mind-to-world direction of fit but deny that these imaginings are

[90] Of course, some philosophers hold that these states are beliefs. For example, Glüer 2009 argues that perceptual experiences are beliefs and Holguín 2022 argues that guesses are beliefs. However, none of these philosophers take mind-to-world direction of fit alone to establish this fact, indicating that they do not rely on premise 2 of Langland-Hassan's argument for imaginative beliefs.

beliefs. So, while the claim that there are imaginings with a mind-to-world direction of fit is interesting, it does not yet establish the much more substantive conclusion that there are imaginative beliefs. Moreover, Langland-Hassan primarily supports premise 1 with intuitions about the correctness conditions of particular imaginings. However, these intuitions are limited both in terms of their dialectical force (these intuitions are unlikely to be shared by all parties to the debate) and in terms of giving a finer-grained account of the attitudinal nature of the imagination (directions of fit are relatively abstract properties that do not yet tell us much about the nature of a given mental state). By contrast, my arguments for imaginative beliefs hinge on the idea that the attitude of belief best explains the core functional and epistemic roles of the imagination. These arguments give us both descriptive and normative grounds for positing imaginative beliefs while also fleshing out an account of their nature.

4.3 The Functional Argument for Imaginative Beliefs

In this section, I will put forward the *functional argument* for imaginative beliefs. The core idea behind the functional argument is that there are imaginings that play the functional roles of belief, and that this is best explained by positing imaginative beliefs.[91]

We have a pre-theoretic grasp on the category of imaginative beliefs. They are what you might call *realistic imaginings*: imaginings that are undertaken with the aim of

[91] From now on, I will use 'imagination' and its cognates to refer to imagistic imagination. This is the core sense of imagination that is it issue in the arguments that follow.

accurately representing the world.[92] Realistic imagining is a central way that imagistic imagination is used. Examples of realistic imaginings include imagining what the inside of your fridge currently looks like, imagining what it will be like to give a talk, and imagining what will occur if you hit a billiard ball at a certain angle. Realistic imaginings need not be accurate as long as they are carried out with the intention or goal of being accurate. Realistic imaginings also need not be aimed at the actual world. One might realistically imagine a non-actual counterfactual scenario.

Before I can argue that realistic imaginings play the functional roles of belief, I first need to say what the functional roles of belief are. While the details are controversial, working at a relatively high level of abstraction we can say that beliefs have distinctive connections to evidence, reasoning, and action. More specifically, beliefs are evidence-sensitive, available for reasoning, and action-guiding.[93] These functional roles are the functional core of belief. They closely track the ways that beliefs are invoked in both folk

[92] Boghossian 2020 uses this terminology to pick out the same class of imaginings. In previous work I have called this "cognitive imagining" (Myers 2021a). Gauker 2021 also uses the terminology of "realistic imaginings," although it is not clear whether he has the same category in mind. The class of realistic imaginings is closely related, but not identical to, what other theorists have called "instructive" imaginings (Kind and Kung 2016) or "actuality-oriented" imaginings (Munro 2021).

[93] Although none of these functional roles are uncontroversial, these roles (or close analogs of them) have been widely appealed to in the literature on the nature of belief. For examples, see Egan 2008, Gendler 2008, Glüer & Wikforss 2013, Loar 1981, Schwitzgebel 2002, Shah & Velleman 2005.

psychological and cognitive scientific explanation. Let me explain each of these functional roles in more detail.[94]

Beliefs are sensitive to the evidence that an agent has. By evidence, I mean mental states that support or make more likely the content of the belief in question. What does it mean for a state to be *sensitive* to an agent's evidence? It needs to be a state that tends to be formed and revised in response to one's evidence.[95] Note that the thesis that beliefs are evidence-sensitive in this sense should not be taken to imply that they are *perfectly* evidence-sensitive. Humans are not perfectly rational, and sometimes form beliefs against their evidence. The rough characterization of evidence-sensitivity can accommodate this. Beliefs tend to be formed and revised in response to evidence but are not perfectly disposed to do so.

Beliefs are available for reasoning. We can break down the functional role of beliefs in reasoning into two parts. First, the kinds of inferences that beliefs feature in have distinctive structures. They include theoretical inferences, in which beliefs combine with other beliefs to produce new beliefs, and practical inferences, in which beliefs combine with desires to produce intentions to act. Second, beliefs are widely available for reasoning. Beliefs can enter into lots of inferences with many other beliefs and desires. A

[94] Exactly how to characterize each of these functional roles is hotly debated. I will characterize each of these roles in a way that is substantive enough to do the argumentative work that I need but that is as neutral as possible about these more fine-grained debates.

[95] See Helton (2020) for a different but related conception of evidence-sensitivity.

belief that is completely inferentially isolated is not a belief at all. Nevertheless, some amount of inferential isolation may be compatible with belief. I'll assume that beliefs can enter into many inferences, where "many" is purposefully vague. This intuitive notion of availability for reasoning will suffice for my purposes.

Finally, beliefs are action-guiding. Beliefs, in conjunction with desires, produce behavior. For example, if I desire water and believe that there is water in the kitchen, all things being equal I will walk to my kitchen and pour myself a glass of water. We behave as if our beliefs are true, given our desires. This property of beliefs is easily motivated by the way in which we invoke beliefs to explain behavior. The fact that I walk to my kitchen is explained by the fact that I believe that there is water in the kitchen. The action-guiding role of beliefs extends to linguistic behavior. For example, the same belief explains why I assert "There is water in my kitchen."

These three clusters of functional roles relating to evidence, reasoning, and action go a long way towards demarcating belief as a distinctive cognitive kind. Together, they distinguish belief from related attitudes. For example, evidence-sensitivity distinguishes belief from perception. In the Müller-Lyer illusion, one sees one of two lines as longer than the other even when one has good evidence that they are the same length and thus believes that they are the same length. All three functional roles distinguish belief from desire. Desires are not sensitive to one's evidence, and they go on to inform one's

reasoning and behavior in very different ways than belief; they make one reason and behave so as to bring about the truth of their content, rather than as if their content is already true.

Exactly how these core functional roles are related to the nature of belief is a matter of some controversy. According to functionalist accounts of belief, the attitude of belief is constituted by a set of functional roles. Many functionalist accounts appeal to the three functional roles explicated here (or close analogs of them).[96] On these views, a belief is any state that is evidence-sensitive, available for reasoning, and action-guiding. To be a belief just *is* to play these functional roles in a subject's cognitive economy. However, even non-functionalists will typically admit that these functional roles, taken together, are a good marker of belief. Beliefs tend to play these functional roles, even if their nature lies elsewhere. As long as these functional roles are good evidence for belief, then the functional argument for imaginative beliefs has dialectical force.

Realistic imaginings play each of the three functional roles associated with belief. Here is the example of realistic imagining that will serve as our case study:

> *Leftovers*: Madelyn made a big batch of butternut squash soup for dinner. Afterwards, she is trying to choose which container to store her leftovers in. She chooses a large container and imagines pouring

[96] See especially Glüer & Wikforss (2013).

> the leftover soup into it. As her imagining unfolds, she imagines all the soup fitting comfortably into the container. Based on this imagining, Madelyn concludes that the soup will fit in the container.

Madelyn's imagining is informed by a wide swath of evidence: her perception of how much soup is left in the pot, her memories of how large the container is, as well as her background beliefs about how liquid tends to fill up containers. Moreover, her imagining is counterfactually sensitive to her evidence. If her evidence had been different, then the content of her imagining would be different in the relevant respect. Suppose that before initiating her imaginative project Madelyn gained new evidence that there was actually more soup left in the pot than it initially appeared (perhaps by looking at the pot from a different angle). In this counterfactual scenario, Madelyn would imagine more soup than in the non-counterfactual scenario described in *Leftovers*. More generally, since realistic imaginings are formed with the goal of representing accurately, they will tend to be sensitive to one's evidence.

Madelyn's imagining is also widely available for reasoning. *Leftovers* involves both an aspect of theoretical reasoning, as evidenced by the fact that Madelyn forms the belief that the soup will fit into the container, and an aspect of practical reasoning, as evidenced by the fact that Madelyn's imagining is being used to guide which container she will choose, given her desire to store the leftover soup. Moreover, Madelyn's imagining is

widely available for reasoning. It is rich with informational content and depending on her purposes Madelyn could form many different beliefs or intentions on its basis. For example, Madelyn could infer that the soup will fill less than three fourths of the container, or that the soup is likely to splatter upon being poured, or that the color of the soup is several shades darker than the color of the container. The fact that Madelyn's imagining is a personal-level state that can enter into many different chains of reasoning with a wide array of beliefs and desires entails that it is widely available for reasoning.

Finally, Madelyn's imagining is action-guiding. Just as a belief that p causes one to act as if p is true, Madelyn's imagining that the soup will fit in the container causes her to behave as if the soup will fit in the container. Her imagining explains why she goes on to reach for the particular container that she does. It may also guide some of the fine-grained motor control that Madelyn engages in. For example, her imagining may guide how she pours the soup and when she stops pouring. Finally, her imagining guides and explains her linguistic behavior in the same way that a paradigmatic belief might. For example, upon imagining that the soup will fit into the container, she might say to her dinner companion, "The soup will fit in this container!"

Madelyn's imagining is not exceptional amongst realistic imaginings in the fact that it plays these three functional roles. For example, I might realistically imagine the flavors of two ingredients at the same time in order to figure out whether those

ingredients would go well together in a dish. This imagining will be sensitive to my evidence about what those ingredients taste like and will go on to guide which ingredients I put into the dish I am cooking. Or, I might imagine crossing the street in order to figure out whether I have enough time to safely do so in the face of oncoming traffic. Once again, if all goes well, this imagining will be sensitive to my evidence about how fast I am able to walk, the speed of the oncoming traffic, and the width of the street. It will then go on to guide my decision about whether to cross the street and, if so, how fast to walk.

The functional parity of realistic imaginings and beliefs gives us reason to posit imaginative beliefs. Madelyn's imagining that the soup will fit into the container just *is* a belief that the soup will fit into the container.[97] Similarly, my realistic imagining of the flavors of two ingredients just is a belief that those two ingredients taste a certain way and my realistic imagining of safely crossing the street just is a belief that I can safely cross the street.

Evidence-sensitivity, availability for reasoning, and action-guidance carve off realistic imagining from other uses of the imagination as a distinctive cognitive kind.[98]

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[97] Strictly speaking, "that the soup will fit in the container" is merely a useful paraphrase of the content of Madelyn's imagining. Its actual content is plausibly much more informationally rich and characterizes how a complex spatial array will evolve over time. I will return to this issue when responding to the circularity objection in §4.4.

[98] There may be borderline cases in which imaginings play some but not all of these functional roles. For example, I might engage in a daydream that is highly sensitive to my evidence but is not disposed to guide my theoretical or practical reasoning. This is no objection to the thesis that realistic imaginings involve the

For example, imaginative daydreams are marked precisely by their insensitivity to evidence and their disconnection from reasoning and action. Imagistic imagining formed over the course of pretense is typically sensitive to the content of the pretense and goes on to guide reasoning and action *within* the pretense. However, this limitation indicates that they are inferentially isolated in a way that is incompatible with outright belief.[99]

There may be borderline cases in which imaginings play some but not all of these functional roles. For example, I might form an imagining that guides my reasoning and action but is only sensitive to a highly selective portion of my evidence. Or, I might daydream a scenario that is highly sensitive to my evidence but is not disposed to guide my theoretical or practical reasoning at all. This is no objection to the thesis that realistic imaginings involve the attitude of belief. This is because it is independently plausible that belief admits of borderline cases. Consider implicit attitudes, delusions, and religious convictions. All of these mental states are both importantly similar to and importantly different from clear, paradigmatic examples of belief, and there is considerable controversy over whether each of these mental states is correctly thought of as a kind of

attitude of belief. This is because it is independently plausible that belief admits of borderline cases that play some but not all of its typical functional roles. We should expect belief to exhibit the same level of vagueness regardless of whether it attaches to an imagistic or non-imagistic representation. See Schwitzgebel 2001 for further discussion.

[99] Although, imagistic imaginings formed during pretense may be well-modeled as beliefs about what is true *in the pretense*. See Langland-Hassan 2020 for development of this idea.

belief.[100] We should expect the concept of belief to exhibit the same level vagueness regardless of the format it is expressed in.[101]

It is also plausible that beliefs can come in degrees. Imaginative degrees of belief are a natural extension of the functional argument. This is because each of the three core functional roles of belief can come in degrees. States can be evidence-sensitive, available for reasoning, and action-guiding to greater or lesser extents. We can appeal to these degreed functional roles in order to distinguish greater and lesser imaginative degrees of belief. For example, a high imaginative degree of belief may be available for reasoning and action-guiding in many practical contexts while a low imaginative degree of belief may only be available for reasoning and action-guiding in practical contexts with low stakes. I'll largely set degrees of belief aside in what follows, but my arguments could be extended to them with only minor modifications.

At this point, one might object that there are functional differences between imagination and belief that preclude a single mental state from being both. There are two notable *prima facie* functional differences that can be sharpened into objections against the functional argument. First, imaginings are occurrent while beliefs are non-occurrent. Call

[100] On implicit attitudes, see Schwitzgebel 2010, Mandelbaum 2016 for the view that they are beliefs, and Gendler 2008, Madva 2016 for the view that they are not beliefs. On delusions, see Bortolloti 2009 and Miyazono 2018 for the view that they are beliefs and Currie & Ravenscroft 2002 and Egan 2008 for the view that they are not beliefs. On religious convictions, see Levy 2017 for the view that they are beliefs and Van Leeuwen 2014 for the view that they are not beliefs.

[101] See Schwitzgebel 2001 for further discussion of borderline cases of belief.

this the *occurrent state objection*. Second, imaginings are voluntary while beliefs are involuntary. Call this the *voluntary control objection*. Let me explain and respond to each objection in turn.

According to the occurrent state objection, imaginings are essentially occurrent while beliefs are essentially non-occurrent.[102] Put roughly, the idea is that imaginings only persist for as long as they are "before the mind" while beliefs persist even when they are not occupying one's thoughts. One does not cease to believe some proposition when they stop entertaining it, but one does cease to imagine when they stop entertaining a mental image. This amounts to a functional disanalogy between imaginings and beliefs, thereby undermining the functional argument.[103]

I have two distinct but mutually compatible responses to the occurrent state objection. First, there are occurrent beliefs.[104] You probably believe that the Earth orbits the Sun. Before reading the last sentence, your belief was non-occurrent. But, presumably, reading that sentence made your belief occurrent. It brought it before your mind in a way

[102] A related worry is that imaginings are dynamic episodes whose content changes over time while beliefs are static states whose content does not change over time. There are two things to say in response. First, not all imaginings are dynamic. Some are simply static images, as when I form a static visual image of my bedroom. Second, dynamic episodes have content that one can take the attitude of belief towards. Madelyn believes that things will evolve over time in a way captured by the content of her imaginative episode. The fact that her imagining has temporal content is no barrier to it being a belief.

[103] There are many accounts of the distinction between occurrent and non-occurrent states in the literature (see Bartlett 2018 for a critical overview). I wish to remain agnostic on the correct account of the distinction, since the occurrent state objection arises from a relatively pre-theoretic intuition.

[104] Occurrent beliefs are sometimes called 'judgments'. I will avoid using this terminology, since some argue that one can judge that p without believing that p (Silins 2012, Cassam 2015).

that it was not prior to reading the sentence. Or, upon seeing the sun shining outside of your window you might consciously affirm that it is not raining outside. In this case, your belief that it is not raining outside manifested in a conscious mental episode. Although there may be functional differences between occurrent and non-occurrent beliefs, these functional differences do not suffice for a difference in attitude. So, we can say that imaginative beliefs are a form of occurrent belief.

Second, it is plausible that there are non-occurrent imaginative beliefs.[105] Realistic imaginings are manifestations of a subject's dispositions to realistically imagine. Some of these dispositions will be relatively stable and persist across long periods of time. For example, even if you are not occurrently realistically imagining what your kitchen looks like, you have stable dispositions to realistically imagine your kitchen as looking a certain way. These imaginative dispositions, I propose, just are a non-occurrent imaginative belief about what your kitchen looks like. One can think of non-occurrent imaginative beliefs as beliefs that are stored in an imagistic format, even if they are not currently being accessed and therefore do not manifest in an occurrent mental episode. More generally, format crosscuts the occurrent/non-occurrent distinction. For example, non-imaginative beliefs have the same (discursive, language-like) format regardless of whether they are occurrent or not. Similarly, we should not expect the imagistic format of a mental state to

[105] This marks an important difference Langland-Hassan's view (2015, 2020) which assumes that imagination is essentially occurrent, and my own view.

preclude it from being non-occurrent. If information can be occurrently displayed in an imagistic format, then in principle it can be stored in that format for later retrieval.[106] One might wish to resist calling non-occurrent imagistic states "imaginings." But this stems from the ordinary usage of "imagination," which connotes an occurrent state, and not the notion of imagistic imagination at issue here.

According to the voluntary control objection, imaginings are voluntary while beliefs are involuntary.[107] This is one of the most influential and widely endorsed objections to the existence of imaginative beliefs. As McGinn puts it, "imagining is subject to the will, while believing is not" (McGinn 2004 p. 132). Spaulding agrees, saying that "imagination is subject to conscious, voluntary control, whereas belief is not" (2015 p. 459). Both theorists use this contrast to motivate the view that imaginings cannot be beliefs. The idea is intuitive enough: while I can imagine any content I would like to, I cannot simply believe any content I would like to. This amounts to a difference in backwards-facing functional roles; intentions can directly cause imaginings but cannot

[106] The extent to which the human mind implements an architecture in which imagistic representations are non-occurrently stored is an empirical question. Fully investigating this question would take us too far afield, so I will just briefly note that there is suggestive evidence that it does implement such an architecture coming from research into how cognitive maps (Epstein et al. 2017) and sensory information (Winkler & Cowan 2005, Brady et al. 2008) are stored in long-term memory.

[107] The voluntary control objection is distinct from but related to the arguments from voluntary control presented in chapters 1 and 3. While those arguments used the premise that the imagination is under voluntary control to argue that the imagination lacks some epistemic property (justificatory force and informativeness, respectively), the voluntary control objection uses this premise to argue that imaginings are not beliefs.

directly cause beliefs. One might object that this difference in functional profiles undermines the functional argument for imaginative beliefs.

A first-pass response is that not all imaginings are voluntarily initiated. Some imaginings simply appear before one's mind unintentionally. A common example is when a catchy song is "stuck in one's head," resulting in an involuntary auditory imagining. These imaginings are not a product of the will. But they may nevertheless be constrained by one's evidence about what the song sounds like and inform one's theoretical and practical reasoning about, for example, what chord progression is used in the chorus of the song. These imaginings share the functional roles that are constitutive of belief *and* are involuntary. Thus, there is a robust class of involuntary realistic imaginings to which the voluntary control objection does not apply.

Although this response would be enough for my purposes insofar as it establishes the existence of imaginative beliefs, it still does not capture many of the central, paradigmatic examples of realistic imaginings. Madelyn's imagining, for example, is voluntarily initiated. She *chooses* to imagine pouring the soup into the container. So, we need an account of imaginative beliefs that can account for even voluntarily initiated imaginative episodes.

An analogy between imagistic thought and non-imagistic thought is helpful in formulating a more comprehensive response to the voluntary control objection. Non-

imagistic thought is typically voluntary. One can non-imagistically think about whatever one wants to. Some non-imagistic thoughts are beliefs. However, one cannot choose which non-imagistic thoughts are beliefs. For example, I can choose to think the non-imagistic thought that *it is raining outside* whenever I want to. But this thought will only count as a belief if it is sensitive to my evidence about the weather, which is not up to me. So, non-imagistic beliefs are involuntary even though their vehicles—non-imagistic thoughts—can be tokened voluntarily.

Exactly analogous remarks apply to imagistic thought. One can imagistically think about whatever one wants to, but one cannot choose which of those imagistic thoughts are beliefs. Whether or not an imagistic thought plays the relevant functional and epistemic roles that are constitutive of belief is not under voluntary control, even if imagistic thought in general is.[108] Imaginative beliefs are involuntary even though the vehicles of imaginative beliefs—imagistic imaginings—are voluntary. In this respect, imagistic and non-imagistic thought are functionally on a par.

Let us apply this observation to our central case study. Madelyn can imagine whatever she would like to. Madelyn can choose to imagine the leftover soup

[108] Balcerak Jackson 2018, Kind 2016, 2018, Langland-Hassan 2016, and Williamson 2016 have all made similar arguments in response to the closely related objection that the voluntary nature of the imagination undermines its epistemic relevance. The core idea uniting their arguments and my own is that the imagination can operate in an involuntary, evidence-sensitive mode. However, these theorists have not drawn out the conclusion that this mode of imagining involves a doxastic attitude.

overflowing the container or she can choose to imagine the leftover soup comfortably fitting inside the container. But what she cannot do is imagine the soup overflowing the container while maintaining her imagining's functional connections to evidence, reasoning, and action. She can choose what to imagine, but she cannot choose which of those imaginings play the functional roles of belief. The vehicle of her imagining is under her voluntary control, but the doxastic attitude associated with that vehicle is not. Therefore, given that Madelyn is engaged in realistic imagination and thus is in the business of forming imaginative beliefs, the content of her imagining is not up to her. This is the sense in which even Madelyn's imaginative episode is involuntary. Thus, the voluntary control objection fails.

4.4 The Epistemic Argument for Imaginative Beliefs

In this section, I will offer a second argument for the existence of imaginative beliefs. The crux of the argument is that the normative epistemic role of realistic imaginings is best explained by the thesis that they are beliefs. As such, we can call it the *epistemic argument* for imaginative beliefs. The argument comes in two parts. First, I will argue that imaginings must have assertoric force in order to justify belief. Then, I will argue that belief is the assertoric attitude that best captures the epistemic role of the imagination.

Imaginings must have assertoric force to confer justification. This follows from a more general principle, which we can call the *assertoric force condition* on justification. The assertoric force condition says, roughly, that a state must have assertoric force for it to have justificatory force. Before clarifying this further, let me say more about what I mean by 'assertoric force'. Different attitudes are associated with different success conditions. Desires represent their contents as to be made true. As a result, they are successful when their contents are made true. Suppositions represent their contents in a totally neutral manner. They merely represent their contents without taking any stand on them. As a result, they have no built-in success conditions. In contrast to desires and suppositions, some mental states, such as beliefs, perceptions, and memories, represent their contents as true. Mental states that represent their contents as true have *assertoric force*.[109] When one believes that p, one does not merely entertain the content that p without taking any stand on its truth. Instead, believing that p is committal about the truth of p. It "asserts" its content rather than merely noncommittally expressing it. As a result, attitudes with assertoric force are successful just in case their contents are true.

[109] Some theorists say that an attitude is 'cognitive' or 'has a mind-to-world direction of fit' to mean the same thing as I mean by saying that an attitude 'has assertoric force.' However, this is not always the case. Some theorists use these other terms more capaciously to include attitudes such as suppositions (e.g. Shah & Velleman 2005). Supposing that p involves supposing that p is true, although it does not "assert" that p is true. I use "assertoric force" to refer to the latter, more demanding sense of representing as true.

It is compatible with a state's having assertoric force that one does not all-things-considered judge its content to be true. For example, in cases of known illusions, one perceives that *p* but does not judge that *p* is true. Nevertheless, one's perceptual state still has assertoric force. The perceptual state itself recommends belief even if one ultimately rejects its recommendation.

States that lack assertoric force lack justificatory force. Intuitively, a mental state that is not committal about what the world is like cannot justify belief about what the world is like. For a mental state to count as evidence in favor of believing that *p*, it must take a stand on the truth of *p*. For example, neither desires nor suppositions can justify beliefs in their content. Since desires and suppositions do not represent their contents as true, they cannot count as evidence in favor of their contents being true. In contrast, perception is a paradigmatic example of a state that has assertoric force. Perceiving that *p* represents that *p* is true. This is precisely why perceiving that *p* can count as a consideration in favor of believing that *p* is true.

These observations motivate the *assertoric force condition* on justification: for a mental state to propositionally justify a belief that *p*, it must represent that *p* with assertoric force. The assertoric force condition merely states a necessary condition on justificatory force. Assertoric force on its own is not sufficient for a mental state to have

justificatory force. One might, for example, have an unjustified belief that p. This belief has assertoric force but lacks justificatory force.

If imaginings can sometimes justify beliefs in their content, and only states with assertoric force can justify beliefs in their content, then it follows that at least some imaginings have assertoric force.[110] Even though this does not yet establish that imaginings are beliefs, this is already a highly significant result. Many theorists hold that imaginings necessarily lack assertoric force. For example, Tucker states that "imagined images lack assertiveness" (2010, p. 533) and McGinn takes it as obvious that imaginings "do not purport to tell us how the world is" and "are neutral about reality" (2004, p. 21). An adequate epistemology of the imagination shows that these views must be mistaken. In order to make sense of the justificatory role of the imagination, we must countenance imaginings with assertoric force.

This argument only establishes that *some* imaginings have assertoric force: those that play a role in justifying belief. It is compatible with the epistemic argument that many imaginings lack assertoric force. The idea that some imaginings have assertoric force while others lack it is independently plausible. Realistic imagining aims to represent the world correctly, and thus represents its content as true. But, when one uses their

[110] Teng 2021 briefly makes a similar argument from the premise that imaginings sometimes justify beliefs to the conclusion that they sometimes represent their content as true.

imagination in service of a pretense or an idle daydream, one has no such aim and thus one's imagining will lack assertoric force.

It is also compatible with the epistemic argument that more imaginings have assertoric force then just those that have justificatory force. Assertoric force is necessary for justificatory force, but justificatory force is not necessary for assertoric force. In much the same way that all beliefs have assertoric force, but do not all have justificatory force because some lack a good evidential basis, there may be imaginings that have assertoric force, but do not have justificatory force because they fail to meet some further condition. This seems like an apt description of imaginings that aim to accurately represent the world and thus qualify as realistic, but which are informed by poor evidence. For example, a realistic imagining that is informed by unjustified beliefs plausibly still purports to represent the world accurately, even if it fails to confer justification.

So far, I have argued that realistic imaginings have assertoric force. Now let me move on to arguing that belief is the assertoric attitude that best characterizes the epistemic role of the imagination.[111] Beliefs confer justification in virtue of being based on

[111] It is worth noting that many other paradigmatic examples of assertoric attitudes, such as perception and memory, are nonstarters for characterizing the epistemic and representational role of the imagination. Perceptions possess assertoric force in virtue of representing their contents as present in egocentric space, while memories possess assertoric force in virtue of representing their contents as true in the past. However, the imagination has assertoric force that is not indexed to a particular spatial or temporal location. For example, an imagining might assertorically represent that a sofa can fit through a doorway without representing this proposition as being true in the past and without representing the sofa as being present in one's environment.

good evidence and thus manifesting a positive epistemic status. In what follows, I will argue that realistic imaginings exhibit the same epistemic structure.[112] This, in turn, is best explained by the thesis that realistic imaginings just are beliefs.

Realistic imaginings only confer justification when they are themselves epistemically based on good evidence.[113] In *Leftovers*, Madelyn's imagining only justifies her belief that the soup will fit into the container if her imagining is based on good evidence about the size and shape of the container and the volume of soup that is leftover. If her imagining were instead based on wishful thinking and irrational optimism about how much soup she can fit into the container, then it would no longer confer justification. The imagination does not take in new information about the world. Instead, it constructs representations out of evidence a subject already has. As a result, its ability to confer justification is dependent on the justificatory force of that prior evidence.

One might want to resist the idea that imaginings can be the result of epistemic basing. According to this line of thought, realistic imaginings might be causally sensitive to one's evidence without being *based* on that evidence. There is little agreement on the exact nature of the epistemic basing relation, and I do not wish to take a stand on that

[112] I develop similar ideas in Myers 2021a, although there I stop short of endorsing the existence of imaginative beliefs.

[113] This claim is stronger than the claim, argued for in chapter 2, that imaginative justification is mediate. While the weaker claim merely says that imaginative justification depends on other prior justification, the stronger claim adds on that imaginings can be epistemically based on prior justification.

thorny issue here.[114] Nevertheless, there are good reasons to think that imaginings can be genuinely based on evidence.[115] This is because on any plausible view of basing, it involves responding to evidence in virtue of the epistemic support that evidence provides (and not, for example, merely as an involuntary reflex).[116] Realistic imaginings are sensitive to evidence not as a brute causal fact but precisely in virtue of the fact that the evidence in question offers epistemic support for the content of the imagining. If I am trying to realistically imagine what my bedroom looks like, then my imagining is causally sensitive to my beliefs and memories about my bedroom precisely because they give me epistemic reasons for thinking that my bedroom looks a certain way. If my evidence supported a different conclusion about what my bedroom looks like then, if all goes well, my imagining would be sensitive to that difference in epistemic support, given my goal to imagine realistically.[117]

Beliefs are evaluable as justified or unjustified. If there are imaginative beliefs, then we should expect imaginings to be epistemically evaluable as well. There are several

[114] At the very least, most theorists take the basing relation to involve causation (Armstrong 1973, Moser 1989, McCain 2012). Some theorists invoke further constraints on basing, such as a higher-order representation of the basis as justifying or rationalizing the state that is based (Leite 2008, Boghossian 2014).
[115] For a different, more extensive argument that imaginings can be epistemically based on evidence, see Myers 2021a.
[116] See Jenkins 2020 p. 260 for a similar formulation.
[117] Many theorists hold that beliefs "aim at truth," although there is little consensus about exactly what this slogan amounts to. Notice that there is a very literal sense in which realistic imaginings aim at truth. Realistic imaginings are formed with the intention to imagine accurately. Thus, there is a natural interpretation of the slogan that beliefs aim at truth according to which realistic imaginings satisfy it, thereby exhibiting a feature that is often taken to be constitutive of, or at least necessary for, belief.

reasons to think that realistic imaginings are epistemically evaluable. First, it is plausible that being based on evidence is sufficient for manifesting an epistemic status (Jenkin 2020). If imaginings can be based on evidence, as I just argued, then we should expect them to be epistemically evaluable according to the amount of support that the evidence they are based on provides for their content. Second, the thesis that realistic imaginings are epistemically evaluable is highly intuitive. Suppose that I attempt to realistically imagine what it is like to live in the countryside, but I let wishful thinking and an irrational bias against city life color how my imagining unfolds. Intuitively, there is something epistemically deficient about this imagining. The thesis that there are imaginative beliefs gives us the resources to say what it is. My imagining, in virtue of being a belief that goes against my evidence, is epistemically unjustified. Third, it is natural to hold subjects epistemically responsible for their realistic imaginings. One might rightly criticize me for basing my imagining on irrational optimism rather than my evidence about what rural life is like. Intuitively, I *ought* to have imagined differently, given my goal of imagining accurately. The thesis that realistic imaginings are beliefs, and therefore incur epistemic responsibility, explains why it is apt to normatively appraise realistic imaginings in this way.[118]

[118] See Myers 2021a for a more comprehensive argument that imaginings can be epistemically evaluable.

At this point, one might object that positing imaginative beliefs makes the epistemology of imagination circular. If Madelyn's imagining just *is* a belief that the soup will fit into the container, then how can it go on to justify a belief that the soup will fit into the container? Call this the *circularity objection* to imaginative beliefs. Getting more precise about the contents of imaginative and non-imaginative beliefs defuses this worry. The imagistic format of Madelyn's imagining means that its content will not be the same as the non-imagistic belief it justifies. Although you could very roughly gloss the content of Madelyn's imagining as that *the soup will fit into the container*, its actual content is much richer and more fine-grained. Plausibly, Madelyn's imagining represents a complex spatial array of properties (including color and shape, and perhaps also including higher-level properties) that evolves over time. Madelyn's non-imaginative belief that she bases on her imagining does not capture this rich spatiotemporal array. Instead, it simply expresses the proposition that *the soup will fit into the container*. Since the contents of the two states are distinct, there is nothing circular about Madelyn basing her non-imaginative belief on her imaginative belief.

I have argued that the attitude of belief best characterizes the epistemic structure of the imagination. Positing imaginative beliefs has the implication that there are imaginings which are epistemically evaluable, capable of being based on evidence, and subject to epistemic norms. Viewed from one angle, this is not particularly surprising.

Imaginative beliefs are beliefs, and it is uncontroversial that beliefs have these properties. But viewed from another angle, it is incredibly surprising. Epistemic normative properties are not typically attributed to the imagination itself. While many theorists are happy to accept that imaginings can justify beliefs, many would balk at the idea that imaginings can themselves be based on evidence and thus be justified or unjustified. I've argued that we need to countenance the latter to adequately explain the former, further bolstering the epistemic argument for imaginative beliefs.

4.5 The Two-State Objection

I have argued that imaginative beliefs best explain the functional and epistemic roles of realistic imaginings. At this point, one might object that we can account for these roles without positing imaginative beliefs. Perhaps, instead of a single state that is both imaginative and doxastic, there are distinct imaginative and doxastic states that explain the functional and epistemic roles of the realistic imagination. On this view, realistic imaginings are not themselves beliefs, but can guide action and justify belief when they are appropriately connected to a subject's non-imaginative beliefs. Call this the *two-state objection*.

The burden is on the proponent of the two-state objection to spell out (a) what the content of the relevant non-imaginative beliefs are and (b) how those non-imaginative beliefs explain the functional and epistemic roles of the realistic imagination. There are a

few importantly different ways of filling in these details. On the first, realistic imaginings are composed of an imagining and a belief about that imagining. On the second, realistic imaginings are composed of an imagining and a belief about what is imagined. On the third, realistic imaginings are composed by a belief with gappy content and an imagining that fills in the gappy content of the belief. Each of these counts as a version of the two-state objection since each of them carves realistic imaginings into a pure imagining and a pure belief, rather than holding that there is a single state that is irreducibly both imaginative and doxastic.

In what follows, I will argue that each version of the two-state objection fails. To be clear, I do not claim that realistic imaginings are *never* associated with other non-imaginative beliefs. This is implausible, and in any case, it is too strong for my purposes. Instead, I want to argue for the more modest claim that realistic imaginings do not need to be supplemented by a separate non-imaginative belief in order to play the functional and epistemic roles that give us reason to posit imaginative beliefs in the first place.

4.5.1 The Metacognitive Two-State View

One way to secure the epistemic and functional roles of the realistic imagination without positing imaginative beliefs is to hold that realistic imaginings are always accompanied by metacognitive beliefs about the accuracy of those imaginings. For example, suppose I realistically imagine what my favorite song sounds like. On the

present suggestion, my imagining is accompanied by a separate belief that refers to the imagining and predicates accuracy of it. For example, the belief in question might have the content *this imagining is accurate,* or *this imagining is produced by a reliable process*. Because this view posits a separate non-imaginative belief that is about the imagining, we can call this the *metacognitive two-state view*.[119]

The metacognitive two-state view attempts to explain the functional and epistemic role of realistic imaginings by reference to the metacognitive belief. The metacognitive belief about the imagining's accuracy might regulate the functional roles of the imagining such that it comes to guide reasoning and behavior in the way characteristic of belief. And, the metacognitive belief, since it affirms the content of the imagining, can go on to do the justificatory work that is typically claimed for realistic imaginings. The most notable proponent of the metacognitive two-state view is Dorsch, who claims that the justificatory role of the imagination depends on "beliefs about the accuracy of how our imaginative experience visually presents things as being" (2016 p. 102). McGinn also expresses sympathy with the metacognitive two state view when he says that "if

[119] The metacognitive two-state view of realistic imaginings is closely related to what I called the metacognitive inferential view in chapter 2. The former says that realistic imaginings involve both an imagistic imagining and a metacognitive belief about that imagining's accuracy. The latter says that imaginings only justify belief in tandem with a belief about the reliability of the imagination. These two views will naturally go together, insofar as views about the nature of the realistic imagination should also explain its justificatory force.

[imaginings] are to have any reality-affirming force, we must take them to be veridical" (2004 p. 21).

The metacognitive two-state view faces the same major problem that plagued the metacognitive inferential view discussed in chapter 2. Namely, there are imaginings that can justify belief and guide action but are not accompanied by any metacognitive belief about their reliability or accuracy. Since I discussed this issue at length in chapter 2, I will keep the present discussion brief. The metacognitive two-state view requires subjects to possess and deploy the concepts of IMAGINATION and ACCURACY or RELIABILITY. It also requires subjects to reflect on their own imaginings in order to gauge how likely they are to be accurate. This entails that subjects who do not possess mental state and epistemic concepts, and who do not possess sophisticated metacognitive capacities, such as animals and young children, are not able to rely on realistic imaginings to guide their reasoning and action. But this is false. There is experimental evidence that infants and young children, as well as some animals, are able to mentally rotate objects in order to successfully gauge whether two objects are the same or different.[120] The fact that they are able to do so in the absence of sophisticated metacognitive concepts or capacities suggests that there are at least some realistic imaginings that do not rely on a metacognitive belief.

[120] For mental rotation in children, see Kosslyn et al. 1990, Ornkloo & von Hofsten 2007, Moore & Johnson 2011, and Frick & Möhring 2013. For mental rotation in animals, see Mauck & Dehnhardt 1997 and Stich et al. 2003 on sea lions, Köhler et al. 2005 on rhesus monkeys, and Hamm, Matheson, & Honig 1997 and Neiworth & Rilling 1987 on pigeons, as well as Blaisdell 2019 for an overview.

Additionally, adult humans often engage in realistic imagination unreflectively. Madelyn might immediately act on her imagining without reflecting on likely that is to be accurate or considering her past track record with respect to similar imaginative projects. This still counts as an imaginative belief insofar as it is sensitive to her evidence and goes on to guide her reasoning and behavior. More generally, we sometimes accept our imaginings at face value. Of course, we also sometimes form metacognitive beliefs about our imaginings. For example, if the stakes are high for Madelyn (perhaps she absolutely needs to fit all of the soup into a single container in order to be able to bring it to her friend's potluck), then she may want to reflect on her imaginative project and consider how likely it is to be accurate before acting on it. But the point is that this extra step is not necessary in order for realistic imagination to play the functional and epistemic roles of belief. Thus, the metacognitive two-state view fails to undermine the existence of imaginative beliefs.

4.5.2 The First-Order Two-State View

The second way of fleshing out the two-state objection is to hold that realistic imaginings play the functional and epistemic roles that they do because they are accompanied by a belief about what is imagined. Consider *Leftovers*. On the present suggestion, Madelyn's imagining is accompanied by a distinct non-imaginative belief that has the same content as her imagining. So, she simultaneously imagines that *the soup*

will fit into the container and also tokens a distinct non-imaginative belief that *the soup will fit into the container*. This accommodates the functional and epistemic role of realistic imaginings because it holds that the content of the imagining is copied into a non-imagistic belief which can then go on to play the relevant functional and epistemic roles. Wiltsher 2019 is the most notable proponent of this view, arguing that "judgments are separate acts from the imaginative states delivering material for judgment" (p. 459). Since this view requires a first-order belief about what is imagined, rather than a metacognitive belief about the imagining itself, we can call this the *first-order two-state view*.[121]

The first-order two-state view avoids the worries that plagued the metacognitive two-state view. It does not overintellectualize realistic imaginings by requiring sophisticated conceptual and metacognitive resources. Nevertheless, it is not very promising. We can frame my objection to the first-order two-state view as a dilemma. The putative non-imaginative first-order belief must be formed either before or after the imaginative project. Both options are problematic.

If the non-imaginative first-order belief is formed after the imaginative project, then it cannot explain the functional or epistemic roles of the imagining itself. A belief

[121] Once again, the first-order two-state view is closely related to the first-order inferential view discussed in chapter 2. Both posit first-order beliefs about the subject matter of the imagining to explain the nature or the justificatory force of the imagination.

that is formed on the basis of an imagining merely restates the datum to be explained, rather than explaining *why* realistic imaginings play a role in belief-formation.

If, instead, the relevant first-order belief is formed prior to the imaginative project, then it has the potential to explain the functional and epistemic roles of the imagining. But this horn of the dilemma is independently implausible. First, it is phenomenologically implausible that one always antecedently has non-imaginative beliefs about the contents of their realistic imaginings. Madelyn might be genuinely unsure about whether the soup will fit into the container at the time that she initiates her imaginative project. Instead, she initiates her imaginative project precisely because she wants to find an answer to this question. Her imagining involves the formation of a new belief, rather than the expression of a previously held belief.[122] Second, and more importantly, this horn of the dilemma is unable to adequately capture the epistemic role of the imagination. Realistic imaginings, when they are properly constrained by one's evidence, can justify beliefs about what is imagined. Madelyn's imagining of the soup fitting into the container justifies her non-imaginative belief that the soup will fit into the container. But, on the present suggestion, she must already have a non-imaginative belief with this content in order for her imagining to have justificatory force in the first place. So, this horn of the dilemma holds that Madelyn's non-imaginative belief that the soup will fit into the

[122] This is bolstered by the arguments of chapter 3, which showed that the imagination can represent contents that outstrip the contents of one's prior beliefs.

container justifies itself. For this reason, the first-order two-state view entails that imaginative justification is circular and thereby undermines the justificatory power of the imagination.[123]

Finally, one might worry that imagistic imaginings and non-imaginative beliefs simply cannot have the same content in virtue of their different formats. If imagistic states and non-imagistic states cannot have the same content, then it will be impossible for one to have a first-order non-imaginative belief that affirms the exact same content as an imagistic imagining. This worry leads naturally into the third way of developing the two-state objection.

4.5.3 The Gappy Two-State View

The final way of fleshing out the two-state objection is to hold that realistic imaginings are accompanied by a belief with gappy content, and that the imagining fills in the gap. David Kaplan (1968 p. 208, quoted in Van Leeuwen 2013) makes the point in the following way:

> Many of our beliefs have the form: 'The color of her hair is ___', or 'The song he was singing went___', where the blanks are filled with images, sensory impressions, or what have you, but certainly not words. If we cannot even say it with words but have to paint it or sing it, we certainly cannot believe it with words.

[123] This worry is importantly different from the circularity objection to imaginative beliefs considered in §4.4. This objection hinged on the idea that it is circular to base a non-imaginative belief on an imaginative belief with similar content, while the present objection to the first-order two-state view hinges on the much more troubling worry that it is circular to base a non-imaginative belief on itself.

Langland-Hassan seems to agree with Kaplan when he states that "images assign properties to an object that is determined by an element of content outside of the image, with images playing a predicative role" (2020 p. 82). On his view, realistic imaginings have a non-imagistic component that is "transferred from one's intentions" (2015 p. 675) and an imagistic component that fills in the predicative gap. We can call this the *gappy two-state view.*

These claims can be interpreted in a weaker or stronger sense, and only the stronger sense qualifies as a version of the two-state objection. The weaker claim is just that imagistic imaginings can have propositional content that is partially determined by a subject's other mental states, such as their intentions and prior beliefs. This is not a version of the two-state view and does not undermine the existence of genuinely imaginative beliefs. The stronger claim is that realistic imaginings only play the functional and epistemic roles of belief when they are supplemented with a non-imagistic format component, thereby requiring realistic imaginings to be supplemented by a non-imaginative belief in order to play the functional and epistemic roles that they do.

Kaplan (1968) is naturally read as endorsing the stronger claim since he expresses the structure of imaginative beliefs as involving both words (i.e. discursive format) and images (i.e. iconic format). Van Leeuwen considers but ultimately falls short of endorsing this stronger claim, saying that "imagery is involved in many beliefs, *possibly* as a

constituent of a larger structure" (Van Leeuwen 2013 p. 222, italics added for emphasis). Langland-Hassan vacillates between the two claims, and it is not always clear which one he is committed to. In some places he merely endorses the weaker claim that "intentions may indeed determine the content of our imaginings" (2015 p. 666). However, I think it is fair to interpret him as endorsing the stronger claim, since in both his initial paper and his more recent book he quite clearly states that "imagination involves both iconic and discursive elements working in tandem" (2015 p. 682) and that "non-imagistic elements of thought combine with mental images to form [imagistic imaginings] with complex contents…" (2020 p. 90). No matter how these theorists are ultimately to be interpreted, the gappy two-state view is clearly an alternative explanation of the functional and epistemic roles of the realistic imagination that is worth considering.

Notice that the primary motivation of the gappy two-state view is different from the metacognitive two-state view and the first-order two state view. While those two views were motivated by the idea that imaginings need to be supplemented with a state of a different *attitude* type in order to play the functional and epistemic roles of beliefs, the gappy two-state view is motivated by the idea that imaginings need to be supplemented with a state of a different *format* type in order to play those roles. The motivating idea seems to be that states with imagistic format are not evaluable for truth

on their own in the way that beliefs are and thus need to be supplemented by a non-imagistic belief in order to play the relevant functional and epistemic roles.

The problem with the gappy two-state view is that states with imagistic format can express truth-evaluable content without the help of a separate non-imagistic format component. A non-mental example is instructive here. Consider a photograph of a tree. This photograph is truth-evaluable. Roughly, it attributes a complex and fine-grained spatial array of colors to a particular scene.[124] It is true just in case the scene instantiates the colored array attributed by the photograph. How does it come to represent that scene? The spatial array of colors that it represents could in principle be attributed to *any* scene, and there is no intrinsic feature of the photograph itself that secures reference to *that* tree rather than some qualitatively identical but numerically distinct tree. The answer, of course, is that the photograph refers to the tree that it does because of its causal history. The fact that it is causally connected to a particular tree secures its reference to that tree. There is no principled sense in which this referential content can correctly be described as "non-imagistic." After all, photographs are a paradigm of imagistic representation and they all come to refer in precisely this way. The photograph does not fill in a gap provided by some distinct non-imagistic representation. Rather, the photograph has a complete, truth-evaluable content all by itself.

[124] There are important questions about the exact nature of this imagistic content. I will set these aside as they are not relevant to the issue at hand.

Imaginings are importantly different from photographs in many ways. But the photograph example acts as a proof of concept. Purely imagistic representations can refer and thus have truth-evaluable content. This alone undermines any reason to think that, in principle, the content of imagistic imaginings must be supplemented by a non-imagistic belief to be evaluable for accuracy. Moreover, it is plausible that mental images are broadly analogous to photographs in that their referential content is determined by their causal history. In *Leftovers*, Madelyn's imagining refers to the soup simply in virtue of being caused by the soup in the right way. Granted, the causal chains connecting imaginings to their referents will often be more complex than the causal chain connecting photographs to their referents. For instance, in many paradigmatic cases, the causal connection between imaginings and their referents is mediated by an intention to imagine a certain object.[125] But the complexity of the causal chain does not undermine the general point that imaginings themselves can refer and thus be evaluated for accuracy all on their own. Much more would have to be said to comprehensively defend a causal account of imaginative reference. The important point is that its coherence and plausibility shift the burden back on the proponent of the gappy two-state view to specify why we must invoke non-imaginative beliefs when realistic imaginings alone suffice.

[125] This is not to say that intentions always determine the referential content of imaginings. There may be other aspects of the causal history of an imagining that also play a content-determining role (Munro 2021, Munro & Strohminger 2021).

4.6 Imaginative Beliefs and Recreativism

In this section, I want to explore one of the theoretical upshots of positing imaginative beliefs. Specifically, I will argue that imaginative beliefs pose a challenge to a popular theory of the nature of the imagination: recreativism.

According to *recreativism*, imaginings are offline recreations of other mental states.[126] On this view, there are imaginative analogs of perception, belief, and desire, among others. Although proponents of this view are rarely very clear about what it means for a mental state to be an offline recreation, the general idea seems to be that a mental state is an offline recreation if it is functionally disengaged from the typical causes and effects of the mental state that it is a recreation of.[127] For example, recreativism holds that there are perception-like imaginings (corresponding roughly to what I have called imagistic imaginings) that are perception-like but are disengaged from the typical causes (sensory stimulation) and effects (belief-formation and action-guidance) of perception. Similarly, there are belief-like imaginings (not to be confused with what I have called imaginative beliefs) that are belief-like in how they enter into inferences with other beliefs and desires but are disconnected from belief's typical causes (evidence) and effects (availability for reasoning and action-guidance).

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[126] Proponents of recreativism include Currie & Ravenscroft 2002, Goldman 2006, Balcerak Jackson 2018, Arcangeli 2020, and Roelofs 2022, forthcoming.

[127] See Roelofs 2022, forthcoming for helpful explication of the functional disengagement account of offline states.

Recreativism holds that imaginings can be recreations of many different types of mental states, and thus that there is functional and attitudinal diversity within the category of imagination. However, it also holds that there is a broader functional profile, and therefore attitudinal kind, that unifies these disparate imaginative states. They are all types of offline recreation. Importantly, recreativism does not hold that imaginings are offline as a matter of contingent fact. Instead, recreativism holds that imaginings are constitutively offline; part of what it is for a mental state to be an imagining for it to be offline.

Imaginative beliefs pose a counterexample to recreativism. This is because imaginative beliefs are imaginings that are associated with an online attitude. Consider, one last time, Madelyn's imagining in *Leftovers.* Madelyn's imagining plays the exact same role in belief-formation and action-guidance as an analogous perceptual state would. Although Madelyn merely imagines pouring the soup into a container, it causes her to form a belief about whether the soup will fit and guide her actions about which container to store the soup in in precisely the same way that a perceptual experience with the same content would. Her imagining recreates not only the internal structure of an online perception but also the functional connections that online perception stands in to reasoning and action. *Leftovers* is an example in which an imagining is not disengaged from these online functional roles.

At this point, the recreativist might restrict their account of offline states to backwards-facing functional disengagement. While Madelyn's imagining has the same effects that an analogous perception would have, it certainly does not have the same causes. Madelyn's imagining is endogenously caused while an analogous perception would be caused by sensory stimulation. Moreover, it is plausible that imaginings are such that they cannot be caused by sensory stimulation in the way that perceptions are. If Madelyn's imagining were caused by the stimulation of her retina, then it would be a perceptual state rather than an imagining. So, perhaps imaginings are constitutively offline in the sense of not having the same causes as analogous perceptual states.

If the notion of 'offline' that the recreativist relies on is just the notion of not being caused by sensory stimulation, then I concede that imaginings are typically offline in this sense.[128] This is already to retreat from the much more expansive and theoretically interesting notion of 'offline' that we started with. However, notice that there is still an important sense in which Madelyn's imagining is not offline even with respect to its backwards-facing functional roles. Madelyn's imagining is constrained by her evidence about the target of her imagining. This includes her beliefs about the volume of soup and of the container, her memories of past experiences storing leftovers, and her occurrent perceptual experience of the leftover soup. All of these inputs are paradigmatically online

[128] Although, as Nanay 2018 points out, imaginings in one sense modality can be triggered by sensory stimulation in a different sense modality.

states, and all of them systematically inform the content of her imagining. But if an imagining takes exclusively online states as inputs, and goes on to guide reasoning and action, then there is simply no meaningful sense in which it is offline. To hold otherwise would be to stretch the notion of 'offline' too thin to be of any theoretical interest.

There are a number of ways that a recreativist might respond. First, they might simply deny that Madelyn's mental state is an online belief. This is, of course, question-begging in the present context. Moreover, a proponent of this response will need to explain why Madelyn's imagining, if it is not itself a belief, nevertheless plays the functional and epistemic roles of belief. The most natural way to do this is to appeal to how Madelyn's offline imagining is related to her online beliefs. But this is just a version of the two-state view, which I already argued against in the previous section.

Second, the recreativist might deny that Madelyn's mental state is an imagining. Recreativists sometimes draw a distinction between any mental state that involves an imagistic format, which includes states like episodic memories and perceptual experiences, and imagination proper, which involves a distinctive attitude (Arcangeli 2020). On this view, not all imagistic imaginings are offline recreations of perception. Perhaps Madelyn's mental state is imagistic but falls short of being an imagining in this richer sense. This seems highly *ad hoc*. Not only is Madelyn's mental state pre-theoretically an imagining *par excellence*, but it also falls under the extension of what

recreativists aim to capture in their theory of their imagination. Madelyn's mental state is exactly the sort of (allegedly) offline perceptual state that recreativists take to be a central form of imagination. As evidence, consider the fact that many recreativists intend for their theory to cover endogenously generated visual mental imagery of exactly the sort that is present in *Leftovers* (e.g. Currie and Ravenscroft 2002). To maintain that Madelyn's mental state is not an imagining would be to artificially restrict the scope of recreativism simply to avoid potential counterexamples.

Third, the recreativist might argue that Madelyn's imagining is an offline perceptual state but an online belief.[129] A state can be an offline recreation of one attitude type while being an online token of another. This strikes me as the most natural way for the recreative to respond. It allows them to agree that Madelyn's imagining is a belief while maintaining that there is an important sense in which it is an offline recreation. The problem with this suggestion is that the two attitude types of online belief and offline perception are associated with mutually incompatible functional profiles such that a single mental state cannot instantiate both simultaneously. While offline perceptions are functionally disengaged from their role in belief-formation and action-guidance, online

[129] This is similar to a possibility that Langland-Hassan (2020 p. 73) considers. He rejects it for the different but related reason that it relies on two distinct notions of recreation. Here is a simplified version of his argument: If there are states that are offline perceptions but online beliefs, it should be possible to take those beliefs offline, such that they are offline perceptions *and* offline beliefs. But this just shows that there are two different notions of offline recreation at play and thus no reason to think there is any important psychological similarity between them.

beliefs function in exactly those roles. For Madelyn's imagining to be an offline perception is for it to be disconnected from guiding action, but for it to be an online belief is for it to be connected to guiding action. So, the very same state cannot be both an offline perception and an online belief. Since the functional roles of Madelyn's imagining are much better captured by the attitude of online belief than of offline perception (given that it does in fact guide her reasoning and action), we should reject the idea that it is an any sense an offline state. I conclude that realistic imaginings constitute a counterexample to recreativism as a general theory of the imagination.

4.7 Conclusion

I have argued that there are imaginative beliefs: imagistic imaginings that take the attitude of belief towards their content. I put forward two arguments for this conclusion. The functional argument hinged on the fact there are imaginings that are evidence-sensitive, available for reasoning, and action guiding, and thus can play the functional roles that are constitutive of beliefs. The epistemic argument hinged on the fact that positing imaginative beliefs best explains the justificatory force and epistemic structure of the imagination. Together, these arguments give us both descriptive and normative grounds for positing imaginative beliefs.[130] Along the way, I responded to the occurrent

[130] The framework offered here for theorizing about the attitudinal nature of the imagination has the potential to extend to doxastic states other than belief. For example, some imaginings may be best modeled as hypotheses rather than beliefs, insofar as they play a role in guiding inquiry and evidence-gathering without constituting full endorsement. See Palmira 2020 for further discussion of hypotheses. Other

state, voluntary control, and circularity objections. I also considered and rejected alternative views according to which realistic imaginings involve separate imaginative and doxastic states. Finally, I argued that the existence of imaginative beliefs undermines recreativism, a popular and influential view of the nature of the imagination.

Imaginative beliefs have important methodological upshots for both philosophy of mind and epistemology. In philosophy of mind, the existence of imaginative beliefs should caution us against theorizing about the imagination as a monolith.[131] The imagination is used in a myriad of different ways, and we should be open to the possibility that these different uses to correspond to different cognitive kinds that are in turn associated with different functional roles and success conditions. In this chapter, I have focused on the realistic imagination and argued that it is best thought of as a form of belief, but further investigation has the potential to uncover other uses of the imagination that correspond to other attitudinal kinds.

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imaginings might be best modeled as mere guesses insofar as they constitute an answer to some question even if one has an arbitrarily low credence that answer is true. See Dorst & Mandelkern 2023 for further discussion of guesses, although see Holguín 2022 for the view that beliefs just are guesses.

[131] Imaginative beliefs also have the potential to synthesize seemingly opposing views throughout philosophy of mind. In debates over what sort of mental state underlies some cognitive or behavioral phenomenon, belief-based theories are often cast as rivals to imagination-based theories. For example, on decision making see Nanay 2016 for an imagination-based view and Smith 1987 for a belief-based view, on implicit bias see Sullivan-Bisset 2019 and Nanay 2021 imagination-based views and Mandelbaum 2016 for a belief-based view, on delusion see McGinn 2004 for an imagination-based view and Bortolotti 2009 for a belief-based view. But if there are imaginative beliefs then it is not clear that imagination and belief-based views of these mental phenomena are really rivals. Perhaps imaginative beliefs underly at least some cases of decision making, implicit bias, and delusions, in which case belief-based and imagination-based theories are just getting at two different sides of the same coin.

In epistemology, positing imaginative beliefs helps to explain the rich epistemic role of the imagination by integrating the relatively young literature on the epistemology of imagination with already the already very well-established literature on the epistemology of belief. Moreover, it provides a useful framework for guiding inquiry into the epistemic properties of the imagination. Countenancing imaginative beliefs allows us to frame questions about the epistemic norms governing the imagination and the conditions under which imaginings are justified that have the potential to shed light on the epistemic properties of the imagination.

Let me end by cautioning against too reductive an understanding of imaginative beliefs. Although imaginative beliefs are beliefs, they are still genuinely imaginative. Epistemologists of imagination should not pack up their bags and go home, leaving their work to more traditional epistemology of belief. Instead, we need to think carefully about the representational and epistemic tradeoffs between imagistic and non-imagistic thought, and the ways that imagistic thought can be employed in guiding reasoning and action. The thesis that there are imaginative beliefs explains the epistemic power of the imagination while leaving room for the imagistic format of the imagination to make a distinctive epistemic contribution.

Bibliography

Adolphs, R., Tranel, D., Damasio, H., Damasio, A. (1994). Impaired recognition of emotion in facial expressions following bilateral damage to the human amygdala. *Nature* 372:669–672.

Arcangeli, Margherita (2020). The Two Faces of Mental Imagery. *Philosophy and Phenomenological Research* 101 (2):304-322.

Armstrong, David M. (1973). *Belief, Truth and Knowledge*. Cambridge University Press.

Armstrong, S., & Mindermann, S. (2018). Occam's razor is insufficient to infer the preferences of irrational agents. In *Advances in Neural Information Processing System.*, 5598-5609.

Aronowitz, S., & Lombrozo, T. (2020). Learning through simulation. *Philosophers' Imprint*, 20(1):1-18.

Asma, Stephen T. (2017). *The Evolution of Imagination*. University of Chicago Press.

Ayton, Peter, Pott, Alice & Elwakili, Najat (2007). Affective forecasting: Why can't people predict their emotions? *Thinking and Reasoning* 13 (1):62 – 80.

Badura, Christopher (2021). How imagination can justify. In Badura, C. and Kind, A., editors. Epistemic Uses of Imagination. Routledge, 141–159.

Balcerak Jackson, Magdalena (2016). On the Epistemic Value of Imagining, Supposing, and Conceiving. In Amy Kind & Peter Kung (eds.), *Knowledge Through Imagination*. Oxford University Press.

Balcerak Jackson, Magdalena (2018). Justification by imagination. In Fiona Macpherson & Fabian Dorsch (eds.), *Perceptual Imagination and Perceptual Memory*. Oxford University Press. 209-226.

Balcerak Jackson, Magdalena, & Balcerak Jackson, Brendan (2013). Reasoning as a source of justification. *Philosophical Studies*, *164*(1):113–126.

Barone, D. F., Hutchings, P. S., Kimmel, H. J., Traub, H. L., Cooper, J. T., & Marshall, C. M. (2005). Increasing empathic accuracy through practice and feedback in a clinical interviewing course. *Journal of Social and Clinical Psychology, 24*(2):156-171.

Barratt, E. S. (1953). An Analysis of Verbal Reports of Solving Spatial Problems as an Aid in Defining Spatial Factors. *Journal of Psychology: Interdisciplinary and Applied*, *36*(1): 17–25.

Bartlett, Gary (2018). Occurrent states. *Canadian Journal of Philosophy, 48*(1):1-17.

Bass, I., Smith, K. A., Bonawitz, E. & Ullman, T. D. (2022) Partial mental simulation explains fallacies in physical reasoning. *Cognitive Neuropsychology*, 38(78):413-424

Battaglia, P. W., Hamrick, J. B., & Tenenbaum, J. B. (2013). Simulation as an engine of physical scene understanding. *Proceedings of the National Academy of Sciences of the United States of America*, *110*(45):18327–18332.

Beck, Jake (2019). Perception is analog: The argument from weber's law. *Journal of Philosophy*, 116 (6):319– 349.

Bergmann, Michael (2006) Justification Without Awareness: A Defense of Epistemic Externalism. Oxford University Press.

Berto, Franz (2021). Equivalence in Imagination. In C. Badura & A. Kind (eds.), *Epistemic Uses of Imagination.* Routledge.

Birch, S. A. J., & Bloom, P. (2007). The curse of knowledge in reasoning about false beliefs. *Psychological Science, 18*(5):382–386.

Blaisdell, Aaron P. (2019) Mental imagery in animals: Learning, memory, and decision making in the face of missing information. *Learn. Behav. 47*:193–216.

Boghossian, Paul. (2003) "Blind Reasoning," Proceedings of the Aristotelian Society, Supplementary Volume 77:225–248.

Boghossian, Paul (2014). What is inference? *Philosophical Studies* 169 (1):1-18.

Boghossian, Paul & Williamson, Timothy (2020). *Debating the a Priori*. Oxford University Press.

Bonjour, Lawrence (1985). *The Structure of Empirical Knowledge*. Harvard University Press.

Bortolotti, Lisa (2009). *Delusions and Other Irrational Beliefs*. Oxford University Press.

Boudry, Maarten & Coyne, Jerry (2016). Disbelief in belief: On the cognitive status of supernatural beliefs. *Philosophical Psychology* 29 (4):601-615.

Brady T. F., Konkle T., Alvarez G. A., Oliva A. (2008) Visual long-term memory has a massive storage capacity for object details. *Proceedings of the National Academy of Sciences*. 105(38):14325-9.

Byrne, R. M., & Johnson-Laird, P. N. (1989). Spatial reasoning. *Journal of Memory and Language, 28*(5):564–575.

Calder A. J., Keane J., Manes F., Antoun N., Young A. W. (2000). Impaired recognition and experience of disgust following brain injury. Nat Neurosci. 3(11):1077-8.

Calmels, Claire & Berthoumieux, Christelle & D'Arripe-Longueville, Fabienne. (2004). Effects of an Imagery Training Program on Selective Attention of National Softball Players. *Sport Psychologist*. 18:272-296.

Carruthers, Peter (2008). Meta-cognition in animals: A skeptical look. *Mind and Language* 23 (1):58–89.

Casey, Edward (2000). *Imagining: A Phenomenological Study 2nd ed.* Bloomington: Indiana University Press.

Cassam, Quassim (2010). Judging, believing and thinking. *Philosophical Issues* 20 (1):80 95.

Chalmers, David J. (2002). Does conceivability entail possibility. In T. Gendler & J. Hawthorne (Eds.), *Conceivability and Possibility*. 145–200.

Cherney I. D. (2008). Mom, let me play more computer games: they improve my mental rotation skills. *Sex Roles* 59:776–786

Chudnoff, Elijah (2012). Presentational Phenomenology. In Sofia Miguens & Gerhard Preyer (eds.), *Consciousness and Subjectivity*. Ontos Verlag. 51–72.

Chudnoff, Elijah (2018). The epistemic significance of perceptual learning. *Inquiry: An Interdisciplinary Journal of Philosophy* 61(5-6):520-542.

Clement, J. (1994). Use of physical intuition and imagistic simulation in expert problem solving. In D. Tirosh (Ed.), *Implicit and explicit knowledge: An educational approach*. Ablex Publishing. 204-244.

Clifton, R. K., Rochat, P., Litovsky, R., & Perris, E. (1991). Object representation guides infants' reaching in the dark. *Journal of Experimental Psychology: Human Perception and Performance*. 17(2):323-329.

Cohen, Stewart (1984). Justification and truth. *Philosophical Studies* 46 (3):279-95.

Cohen, Stewart (2002). Basic Knowledge and the Problem of Easy Knowledge. *Philosophy and Phenomenological Research*, *65*(2):309–329.

Cohen, C. A., & Hegarty, M. (2014). Visualizing cross sections: Training spatial thinking using interactive animations and virtual objects. *Learning and Individual Differences, 33:*63–71.

Cook, N. J., & Breedin, S. D. (1994). Constructing naive theories of motion on the fly. *Memory & Cognition*, *22*(4):474-493.

Currie, Gregory & Ravenscroft, Ian (2002). *Recreative Minds: Imagination in Philosophy and Psychology*. Oxford University Press.

Davies, Arthur Ernest (1907). Imagination and Thought in Human Knowledge. *Journal of Philosophy, Psychology, and Scientific Methods* 4(24):645.

Davis M. H., Soderlund T., Cole J., Gadol E., Kute M., Myers M., Weihing J. (2004). Cognitions associated with attempts to empathize: how do we imagine the perspective of another? Pers Soc Psychol Bull. 30(12):1625-35.

Dehaene, S. (2011). The Number Sense: How the Mind Creates Mathematics (Revised and updated ed.). *Oxford University Press.*

Deonna, Julien & Nanay, Bence (2014). Simulation versus theory-theory. A plea for an epistemological turn. In Anne Reboul (ed.), *Mind, Value and Metaphysics*. Springer.

DiSessa, Andrea A. (1982). Unlearning Aristotelian Physics: A Study of Knowledge Based Learning. *Cognitive Science* 6 (1):37-75.

Dogramaci, Sinan (2013). Intuitions for inferences. *Philosophical Studies* 165 (2):371-399.

Dorsch, Fabian (2016). Knowledge by imagination - how imaginative experience can ground knowledge. *Teorema: International Journal of Philosophy* 35 (3): 87-116.

Dorst, Kevin & Mandelkern, Matthew (2023). Good Guesses. *Philosophy and Phenomenological Research* 105 (3):581-618.

Egan, Andy (2008). Imagination, delusion, and self-deception. In Tim Bayne & Jordi Fernandez (eds.), *Delusion and Self-Deception: Affective and Motivational Influences on Belief Formation (Macquarie Monographs in Cognitive Science)*. Routledge.

Egeland, Jonathan (2021). Imagination cannot justify empirical belief. Episteme, 18(4): 507-513.

Engisch, Patrik & Langkau, Julia (eds.) (2022). *The Philosophy of Fiction: Imagination and Cognition*. Routledge.

Epley, N., & Caruso, E. M. (2009). Perspective taking: Misstepping into others' shoes. In K. D. Markman, W. M. P. Klein, & J. A. Suhr (Eds.), *Handbook of imagination and mental simulation*. Psychology Press. 295-309.

Epstein R. A., Patai E. Z., Julian J. B., Spiers H. J. (2017) The cognitive map in humans: spatial navigation and beyond. *Nature Neuroscience*. 20(11):1504-1513

Estes, David (1998). Young children's awareness of their mental activity: The case of mental rotation. *Child Development, 69*(5):1345–1360.

Finke, R. A., & Pinker, S. (1982). Spontaneous imagery scanning in mental extrapolation. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 8*(2):142–147.

Fox, P. T., Miezin, F. M., Allman, J. M., Van Essen, D. C., & Raichle, M. E. (1987). Retinotopic organization of human visual cortex mapped with positron-emission tomography. *Journal of Neuroscience*, *7*(3):913-922.

Frick, A., Hansen, M. A., & Newcombe, N. S. (2013). Development of mental rotation in 3- to 5-year-old children. *Cognitive Development*, *28*(4):386–399.

Frick, A., & Möhring, W. (2013). Mental object rotation and motor development in 8- and 10-month-old infants. *Journal of Experimental Child Psychology*, *115*(4):708-720.

Fricker, Miranda (2003). Epistemic injustice and a role for virtue in the politics of knowing. *Metaphilosophy*, *34*(1/2):154–173.

Fuentes, A. (2020). "The evolution of a human imagination," in *The Cambridge Handbook of the Imagination.* 1st *Edn*. ed. A. Abraham (Cambridge: Cambridge University Press), 13–29.

Gauker, Christopher (2017). Visual Imagery in the Thought of Monkeys and Apes. In Kristin Andrews & Jacob Beck (eds.), *The Routledge Handbook of Philosophy of Animal Minds.* New York, USA: Routledge. pp. 25-33.

Gauker, Christopher (2021). Imagination constrained, imagination constructed. *Inquiry: An Interdisciplinary Journal of Philosophy*.

Goodman, Nelson (1968). *Languages of art*. Bobbs-Merrill.

Gendler, Tamar Szabó (1998). Galileo and the indispensability of scientific thought experiment. *The British Journal for the Philosophy of Science*, 49(3):397-424.

Gendler, Tamar Szabó (2008). Alief and Belief. *Journal of Philosophy* 105 (10):634-663.

Ginsburg, Simona, and Jablonka, Eva. 2014. " Memory, Imagination, and the Evolution of Modern Language." In *The Social Origins of Language*, eds. Daniel Dor, Chris Knight, and Jerome Lewis. Oxford University Press.

Glüer, Kathrin (2009). In Defence of a Doxastic Account of Experience. *Mind and Language* 24 (3):297-327.

Glüer, Kathrin & Wikforss, Åsa (2013). Aiming at truth: on the role of belief. *Teorema: International Journal of Philosophy 32*(3):137-162.

Glushko, R. J., & Cooper, L. A. (1978). Spatial comprehension and comparison processes in verification tasks. *Cognitive Psychology, 10*(4):391–421.

Goldman, Alvin I. (1979). What is Justified Belief? In G. Pappas (ed.) *Justification and Knowledge*. 1-23.

Goldman, Alvin I. (2006). *Simulating Minds: The Philosophy, Psychology, and Neuroscience of Mindreading*. Oxford University Press.

Grandin, Temple (1995). *Thinking in Pictures: My Life With Autism*. New York: Random House.

Gregory, Dominic (2020). Imagery and Possibility. *Noûs*, *54*(4):755–773.

Grzankowski, Alex (2015). Pictures Have Propositional Content. *Review of Philosophy and Psychology*, 6:151–163

Hamm, Jeff, Matheson, William R., & Honig, Werner K. (1997). Mental Rotation in Pigeons (Columba livia)? *Journal of Comparative Psychology*, *111*(1):76–81.

Hamrick, J. B. (2019). Analogues of mental simulation and imagination in deep learning. *Current Opinion in Behavioral Sciences*, 29:8—16.

Hamrick, J. B., Battaglia, P. W., Griffiths, T. L., & Tenenbaum, J. B. (2016). Inferring mass in complex scenes by mental simulation. *Cognition*, *157*:61–76.

Harman, Gilbert (1984). Logic and Reasoning. *Synthese*, 60(1): 107–127.

Haut, K. M., Dodell-Feder, D., Guty, E., Nahum, M., & Hooker, C. I. (2019). Change in objective measure of empathic accuracy following social cognitive training. *Frontiers in Psychiatry, 10,* Article 894.

Hegarty, M. (2004). Mechanical reasoning by mental simulation. *Trends in Cognitive Sciences, 8*(6):280–285.

Hegarty, M., & Sims, V. K. (1994). Individual differences in mental animation during mechanical reasoning. *Memory & Cognition, 22*(4):411–430.

Hegarty, M., & Waller, D. (2004). A dissociation between mental rotation and perspective taking spatial abilities. *Intelligence, 32*(2):175–191.

Heiphetz, Larisa, Landers, Casey, & Van Leeuwen, Neil (2021). Does "Think" Mean the Same Thing as "Believe"? Linguistic Insights Into Religious Cognition. *Psychology of Religion and Spirituality* 13 (3):287-297.

Helton, Grace (2020). If You Can't Change What You Believe, You Don't Believe It. *Noûs* 54 (3):501-526.

Holguín, Ben (2022). Thinking, Guessing, and Believing. *Philosophers' Imprint* 22 (1):1-34.

Hollard, V. D., & Delius, J. D. (1982). Rotational invariance in visual pattern recognition by pigeons and humans. *Science*, *218*(4574):804–806.

Huemer, Michael (1999). The Problem of Memory Knowledge. *Pacific Philosophical Quarterly*, *80*(4):346–357.

Huemer, Michael (2001). *Skepticism and the Veil of Perception*. Lanham: Rowman & Littlefield.

Huemer, Michael (2007). Compassionate Phenomenal Conservatism. *Philosophy and Phenomenological Research*, *74*(1):30–55.

Hyde, Madeleine (2019). Keeping the Imagination Epistemically Useful in The Face of Bias. *Journal of Cognition and Neuroethics*, *6*(1):31–55.

Hyde, Madeleine (2021). *Can Imagination Give Rise to Knowledge?* Dissertation, Stockholm University.

Jackson P. L., Meltzoff A. N., Decety J. (2005). How do we perceive the pain of others? A window into the neural processes involved in empathy. *Neuroimage*. 24(3):771-9.

Jeannerod M. (2001). Neural simulation of action: a unifying mechanism for motor cognition. *Neuroimage*. 14(1):S103-9.

Jenkin, Zoe (2020). The Epistemic Role of Core Cognition. *Philosophical Review* 129 (2):251-298.

Johnson, Gabbrielle M. (2020). The Structure of Bias. *Mind* 129 (516):1193-1236.

Johnson, S. P., & Moore, D. S. (2020). Spatial thinking in infancy: Origins and development of mental rotation between 3 and 10 months of age. *Cognitive Research: Principles and Implications,* 5, Article 10.

Kaiser, M.K., Jonides, J. & Alexander, J. (1986). Intuitive reasoning about abstract and familiar physics problems. *Mem Cogn* 14:308–312.

Kaiser, M. K., Proffitt, D. R., Whelan, S. M., & Hecht, H. (1992). Influence of animation on dynamical judgments. *Journal of Experimental Psychology: Human Perception and Performance, 18*(3), 669–689.

Kaplan, David (1968). Quantifying in. *Synthese* 19 (1-2):178-214.

Karlan, Brett (2020). Reasoning with heuristics. *Ratio* 34 (2):100-108.

Kinberg, Ori & Levy, Arnon (2022). The Epistemic Imagination Revisited. *Philosophy & Phenomenological Research.*

Kind, Amy (2013). The Heterogeneity of the Imagination. *Erkenntnis* 78 (1):141-159.

Kind, Amy (2016). Imagining under constraints. In Amy Kind and Peter Kung (eds.), *Knowledge Through Imagination*. Oxford University Press, 145–59.

Kind, Amy (2018). How imagination gives rise to knowledge. In F. Dorsch & F. Macpherson (eds.), *Perceptual memory and perceptual imagination*. New York: Oxford University Press. 227-46.

Kind, Amy (2020). The Skill of Imagination. In Ellen Fridland & Carlotta Pavese (eds.), Routledge Handbook of Skill and Expertise. Routledge. pp. 335-346.

Kind, Amy (2022a). Fiction and the Cultivation of Imagination. In Julia Langkau & Patrik Engisch (eds.), The Philosophy of Fiction: Imagination and Cognition. Routledge. pp. 262-281.

Kind, Amy (2022b). Learning to Imagine. *British Journal of Aesthetics* 62 (1):33-48.

Kind, Amy, & Kung, Peter (2016). Introduction: the puzzle of imaginative use. In Amy Kind and Peter Kung (eds.), *Knowledge Through Imagination*. Oxford University Press, 1–40.

Klein, I., Dubois, J., Mangin, J. M., Kherif, F., Flandin, G., Poline, et al. (2004). Retinotopic organization of visual mental images as revealed by functional magnetic resonance imaging. *Cognitive Brain Research, 22* (1):26–31

Köhler, Christian, Hoffmann, Klaus P., Dehnhardt, Guido, & Mauck, Björn (2005). Mental rotation and rotational invariance in the Rhesus monkey (Macaca mulatta). *Brain, Behavior and Evolution*, *66*(3):158–166.

Kosslyn, Stephen M. (1973). Scanning visual images: some structural implications. *Perception & Psychophysics* 14:90–94

Kosslyn, Stephen M. (1994). *Image and brain: The resolution of the imagery debate.* The MIT Press.

Kosslyn, Stephen M., Margolis, Jonathon A., Barrett, Anna M., Goldknopf, Emily J., & Daly, Philip F. (1990). Age Differences in Imagery Abilities. *Child Development*, *61*(4):995–1010.

Kosslyn, Stephen M., Thompson, William L., & Ganis, Giorgio (2006). *The case for mental imagery.* Oxford University Press.

Kozhevnikov, M., & Hegarty, M. (2001). Impetus beliefs as default heuristics: Dissociation between explicit and implicit knowledge about motion. *Psychonomic Bulletin & Review, 8*(3):439–453.

Kriegel, Uriah (2015). Perception and Imagination. In S. Miguens, G. Preyer & C. Bravo Morando (eds.), *Prereflective Consciousness: Sartre and Contemporary Philosophy of Mind*. Routledge. pp. 245-276.

Kriegel, Uriah (2021). The Structure of Phenomenal Justification. *Australasian Journal of Philosophy*.

Kulvicki, John (2015). Analog Representation and the Parts Principle. *Review of Philosophy and Psychology*, 64 (1):165–180.

Kung, Peter (2010). Imagining as a Guide to Possibility. *Philosophy and Phenomenological Research* 81(3):620-663.

Langland-Hassan, Peter (2015). Imaginative attitudes. *Philosophy and Phenomenological Research, 90*(3):664-687.

Langland-Hassan, Peter (2016). On choosing what to imagine. In A. Kind & P. Kung (eds.), *Knowledge Through Imagination*. Oxford University Press. pp. 61-84.

Langland-Hassan, Peter (2020). *Explaining Imagination*. Oxford: Oxford University Press.

Lawrence A. D., Calder A. J., McGowan S. W., Grasby P. M. (2002). Selective disruption of the recognition of facial expressions of anger. *Neuroreport*. 13(6):881-4.

Lee, Andrew Y., Myers, Joshua & Rabin, Gabriel Oak (2023). The Structure of Analog Representation. *Noûs*. 57(1):209-237.

Lee, Andrew Y., Myers, Joshua & Rabin, Gabriel Oak (manuscript). The Structure of Iconic Representation.

Leite, Adam (2008). Believing one's reasons are good. *Synthese* 161 (3):419-441.

Levy, Neil (2017). Religious beliefs are factual beliefs: Content does not correlate with context sensitivity. *Cognition* 161:109-116.

Levy, Arnon & Godfrey-Smith, Peter (eds.) (2019). *The Scientific Imagination*. Oxford University Press.

Loar, Brian (1981). *Mind and Meaning*. Cambridge University Press.

Ludwin-Peery, E., Bramley, N. R., Davis, E., & Gureckis, T. M. (2020). Broken physics: A conjunction-fallacy effect in intuitive physical reasoning. Psychological Science, 31(12):1602–1611.

MacLeod, C. M., Hunt, E. B., & Mathews, N. N. (1978). Individual differences in the verification of sentence–picture relationships. *Journal of Verbal Learning & Verbal Behavior, 17*(5):493–507.

Madva, Alex (2016). Why implicit attitudes are (probably) not beliefs. *Synthese* 193(8): 2659-2684.

Maibom, Heidi L. (2016). Knowing me, knowing you: Failure to forecast and the empathic imagination. In A. Kind & P. Kung (Eds.), *Knowledge through imagination* Oxford University Press. 185-206.

Mallozzi, Antonella (2021). Imagination, Inference, and Apriority. In C. Badura & A. Kind (Eds.), *Epistemic Uses of Imagination*. Routledge, 160-180.

Mandelbaum, Eric (2016). Attitude, Inference, Association: On the Propositional Structure of Implicit Bias. *Noûs* 50 (3):629-658.

Mauck, Björn & Dehnhardt, Guido (1997). Mental rotation in a California sea lion (Zalophus californianus). *Journal of Experimental Biology*, *200*(9):1309–1316.

McCain, Kevin (2012). The interventionist account of causation and the basing relation. *Philosophical Studies* 159 (3):357-382.

McCloskey, M., & Kohl, D. (1983). Naive physics: The curvilinear impetus principle and its role in interactions with moving objects. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 9*(1):146–156.

McCloskey, M., Washburn, A., & Felch, L. (1983). Intuitive physics: The straight-down belief and its origin. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 9*(4):636–649.

McGinn, Colin (2004). *Mindsight : image, dream, meaning.* Cambridge, Mass.: Harvard University Press

Mithen, Steven J. (2001). The Evolution of Imagination: An Archaeological Perspective. *Substance* 30(1/2):28.

Miyazono, Kengo (2018). *Delusions and Beliefs: A Philosophical Inquiry*. Routledge.

Moen K. C., Beck M. R., Saltzmann S. M., Cowan T. M., Burleigh L. M., Butler L. G., Ramanujam J., Cohen A. S., Greening S. G. (2020). Strengthening spatial reasoning: elucidating the attentional and neural mechanisms associated with mental rotation skill development. *Cogn. Research* 5(1):20.

Montell C. 2002. "On Evolution of God-Seeking Mind: An Inquiry into Why Natural Selection Would Favor Imagination and Distortion of Sensory Experience." *Evolution and Cognition* 8:1-19.

Moore, David S., & Johnson, Scott P. (2008). Mental rotation in human infants: A sex difference. *Psychological Science*, *19*, 1063–1066.

Moore, David S., & Johnson, Scott P. (2011). Mental Rotation of Dynamic, Three Dimensional Stimuli by 3-Month-Old Infants. *Infancy*, *16*(4):435–445.

Moser, Paul K. (1989). *Knowledge and Evidence*. Cambridge University Press.

Moulton S. T., Kosslyn S. M. (2009). Imagining predictions: mental imagery as mental emulation. Philos Trans R Soc Lond B Biol Sci. 364(1521):1273-80.

Munro, Daniel (2021). Imagining the Actual. *Philosophers' Imprint* 21 (17).

Munro, Daniel & Strohminger, Margot (2021). Are We Free to Imagine What We Choose? *Synthese* (5-6):1-18.

Murphy, Alice (2022). Imagination in science. *Philosophy Compass* 17 (6):e12836.

Myers, Joshua (2021a). The Epistemic Status of the Imagination. *Philosophical Studies* 178 (10):3251-3270.

Myers, Joshua (2021b). Reasoning with imagination. In C. Badura & A. Kind (eds.), *Epistemic Uses of Imagination.* Routledge, 103-121.

Nanay, Bence (2015). Perceptual content and the content of mental imagery. *Philosophical Studies* 172:1723–1736.

Nanay, Bence (2016). The role of imagination in decision-making. *Mind and Language* 31 (1):126-142.

Nanay, Bence (2018). Multimodal mental imagery. *Cortex* 105:125-136.

Nanay, Bence (2021). Implicit bias as mental imagery. *Journal of the American Philosophical Association* 7(3):329-347.

Neiworth, Julie J., & Rilling, Mark E. (1987). A Method for Studying Imagery in Animals. *Journal of Experimental Psychology: Animal Behavior Processes*, *13*(3):203 214.

Nichols, Shaun & Stich, Stephen P. (2000). A cognitive theory of pretense. *Cognition* 74 (2):115-147.

Nichols, Shaun & Stich, Stephen P. (2003). *Mindreading: An Integrated Account of Pretence, Self-Awareness, and Understanding Other Minds*. Oxford University Press.

Nickerson, R. S. (1999). How we know—and sometimes misjudge—what others know: Imputing one's own knowledge to others. *Psychological Bulletin, 125*(6):737–759.

Nishimura, K. ., Aoki, T. ., Inagawa, M. ., Tobinaga, Y. ., & Iwaki , S. (2021). Determination of Individual Differences in Mental Imagery Tasks: An Approach to Visual Thinkers and Verbal Thinkers. *Recent Developments in Medicine and Medical Research Vol. 15*, 29–37.

Örnkloo, Helena, & von Hofsten, Claes (2007). Fitting objects into holes: On the development of spatial cognition skills. *Developmental Psychology*, *43*(2):404–416.

O'Shaughnessy, Brian (ed.) (2000). *Consciousness and the World*. Oxford University Press.

Palmira, Michele (2020). Inquiry and the doxastic attitudes. *Synthese* 197 (11):4947-4973.

Peacocke, Christopher (2019). *The primacy of metaphysics*. Oxford University Press.

Phillips, M. L., Young, A. W., Senior, C., Brammer, M., Andrews, C., Calder, A. J., Bullmore, E. T., Perrett, D. I., Rowland, D., Williams, S. C. R., Gray, J. A., & David, A. S. (1997). A specific neural substrate for perceiving facial expressions of disgust. *Nature, 389*(6650):495–498.

Pryor, James (2000). The skeptic and the dogmatist. *Nous*, *34*(4):517–549.

Pryor, James (2004). What's wrong with Moore's argument? *Philosophical Issues* 14(1): 349-378.

Pylyshyn, Zenon W. (2002). Mental imagery: In search of a theory. *Behavioral and Brain Sciences* 25 (2):157-182.

Quinn, P. C., & Liben, L. S. (2008). A sex difference in mental rotation in young infants. Psychological Science, 19, 1067–1070.

Read D, van Leeuwen B. (1998). Predicting Hunger: The Effects of Appetite and Delay on Choice. *Organ Behav Hum Decis Process.* 76(2):189-205.

Reichle E. D., Carpenter P. A., Just M. A. (2000). The neural bases of strategy and skill in sentence-picture verification. Cogn Psychol. 40(4):261-95.

Rodgers, W., Hall, C., & Buckolz, E. (1991). The effect of an imagery training program on imagery ability, imagery use, and figure skating performance. *Journal of Applied Sport Psychology*, *3*(2):109–125.

Roelofs, Luke (2017). Seeing the Invisible: How to Perceive, Imagine, and Infer the Minds of Others. *Erkenntnis* 83 (2):205-229.

Roelofs, Luke (2022). Longings in Limbo: A New Defence of I-Desires. *Erkenntnis*:1-25.

Roelofs, Luke (forthcoming). *Empathic Reason: Imagination, Morality, and the Minds of Others*. Oxford University Press.

Sartre, Jean-Paul. 1948. *The Psychology of Imagination.* New York: Philosophical Library

Schechter, Joshua (2019). Small Steps and Great Leaps in Thought: The Epistemology of Basic Deductive Rules. In Magdalena Balcerak Jackson & Brendan Balcerak Jackson (eds.), *Reasoning: New Essays on Theoretical and Practical Thinking*. Oxford: Oxford University Press. 152-77.

Schellenberg, Susanna (2013). Belief and Desire in Imagination and Immersion. *Journal of Philosophy* 110 (9):497-517.

Schoonen, Tom (2021). A Note on the Epistemological Value of Pretense Imagination. *Episteme* 1-20.

Schwartz, D. L., & Black, T. (1999). Inferences through imagined actions: Knowing by simulated doing. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 25*(1), 116–136.

Schwitzgebel, Eric (2001). In-between believing. *Philosophical Quarterly* 51 (202):76-82.

Schwitzgebel, Eric (2002). A Phenomenal, Dispositional Account of Belief. *Noûs* 36 (2):249-275.

Schwitzgebel, Eric (2006). The unreliability of naive introspection. *Philosophical Review* 117 (2):245-273.

Schwitzgebel, Eric (2010). Acting contrary to our professed beliefs or the gulf between occurrent judgment and dispositional belief. *Pacific Philosophical Quarterly* 91 (4):531-553.

Sereno, M. I., Dale, A. M., Reppas, J. B., Kwong, K. K., Belliveau, J. W., Brady, T. J., et al. (1995). Borders of multiple visual areas in humans revealed by functional magnetic resonance imaging. *Science, 268*, 889–893.

Shah, Nishi & Velleman, David J. (2005). Doxastic deliberation. *Philosophical Review* 114 (4):497-534.

Shea, Nicholas (2022). Concepts as Plug & Play Devices. *Philosophical Transactions of the Royal Society B* 378:20210353.

Shepard, R. N., & Metzler, J. (1971). Mental rotation of three-dimensional objects. *Science*, 171(3972), 701-703.

Shimojima, Atsushi (2015). *Semantic properties of diagrams and their cognitive potentials*. Center for the Study of Language and Information.

Siegel, Susanna (2012). Cognitive penetrability and perceptual justification. *Nous*, *46*(2):201-222.

Siegel, Susanna (2017). *The Rationality of Perception*. Oxford University Press.

Silins, Nicholas (2012). Judgment as a Guide to Belief. In Declan Smithies & Daniel Stoljar (eds.), *Introspection and Consciousness*. Oxford University Press.

Sims, V. K., & Hegarty, M. (1997). Mental animation in the visuospatial sketchpad: Evidence from dual-task studies. *Memory & Cognition, 25*(3):321–332.

Singer T, Seymour B, O'Doherty J, Kaube H, Dolan RJ, Frith CD. (2004). Empathy for pain involves the affective but not sensory components of pain. Science. 303(5661):1157-62.

Sinhababu, Neil. (2013). Distinguishing Belief and Imagination. *Pacific Philosophical Quarterly* 94(2):152–65.

Slotnick, S. D., Thompson, W. L., & Kosslyn, S. M. (2005). Visual mental imagery induces retinotopically organized activation of early visual areas. *Cerebral Cortex, 15*(10):1570–1583.

Smith, Michael (1987). The Humean theory of motivation. *Mind* 96(381):36-61.

Sosa, Ernest (2007). *A Virtue Epistemology: Apt Belief and Reflective Knowledge*. Oxford University Press.

Spaulding, Shannon (2015). Imagination, Desire, and Rationality. *Journal of Philosophy* 112 (9):457-476.

Spaulding, Shannon (2016). Imagination Through Knowledge. In A. Kind & P. Kung (eds.), *Knowledge Through Imagination*. Oxford University Press. 207–226.

Sprengelmeyer, R., Young, A. W., Schroeder, U., Grossenbacher, P. G., Federlein, J., Büttner, T., & Przuntek, H. (1999). Knowing No Fear. *Proceedings: Biological Sciences*, *266*(1437): 2451–2456.

Stein, Nathaniel (2021). Imagination, expectation, and "thoughts entangled in metaphors". *Synthese* 199:9411–9431.

Stich, Kai P., Dehnhardt, Guido, & Mauck, Björn. (2003). Mental rotation of perspective stimuli in a California sea lion (Zalophus californianus). *Brain, Behavior and Evolution*, *61*(2):102–112.

Stinson, L., & Ickes, W. (1992). Empathic accuracy in the interactions of male friends versus male strangers. *Journal of Personality and Social Psychology, 62*(5):787–797.

Stuart, Michael T. (2019). Towards a dual process epistemology of imagination. *Synthese* (2):1-22.

Suddendorf, T. and Dong, A. (2013) On the evolution of imagination and design. In The Oxford Handbook of the Imagination (Taylor, M., ed.), 453–467

Sullivan-Bissett, Ema (2019). Biased by our imaginings. *Mind and Language* 34 (5):627 647.

Tartaglia, E. M., Bamert, L., Mast, F. W., & Herzog, M. H. (2009). Human Perceptual Learning by Mental Imagery. *Current Biology*, *19*(24), 2081–2085.

Tartaglia, E. M., Bamert, L., Herzog, M. H., & Mast, F. W. (2012). Perceptual learning of motion discrimination by mental imagery. *Journal of Vision*, *12*(6).

Taylor, Paul (1981). Imagination and Information. *Philosophy and Phenomenological Research* 42 (2):205-223.

Teng, Lu (2016). Cognitive Penetration, Imagining, and the Downgrade Thesis. *Philosophical Topics*, *44*(2):405–426.

Teng, Lu (2018). Is phenomenal force sufficient for immediate perceptual justification? *Synthese*, *195*(2):637–656.

Teng, Lu (2021). Cognitive Penetration: Inference or Fabrication? *Australasian Journal of Philosophy* 99 (3):547-563.

Tooming, Uku (2018). There is Something about the Image: A Defence of the Two Component View of Imagination. *Dialectica* 72 (1):121-139.

Toussaint L., Tahej P. K., Thibaut J. P., Possamai C. A., Badets A. (2013). On the link between action planning and motor imagery: a developmental study. *Exp Brain Res*. 231(3):331-9.

Tucker, Chris (2010). Why open-minded people should endorse dogmatism. *Philosophical Perspectives* 24 (1):529-545.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185*(4157):1124–1131.

Van Boven, L., & Loewenstein, G. (2003). Social Projection of Transient Drive States. *Personality and Social Psychology Bulletin, 29*(9), 1159–1168.

Van Leeuwen, Neil (2013). The Meanings of "Imagine" Part I: Constructive Imagination. *Philosophy Compass* 8 (3):220-230.

Van Leeuwen, Neil (2014). Religious Credence is not Factual Belief. *Cognition* 133 (3):698-715.

Vogt S, Di Rienzo F, Collet C, Collins A, Guillot A. (2013). Multiple roles of motor imagery during action observation. Front Hum Neurosci. 7:807.

Walton, Kendall L. (1990). *Mimesis as Make-Believe: On the Foundations of the Representational Arts*. Harvard University Press.

Wedgwood, Ralph (2007). The Normative Force of Reasoning. *Noûs* 40:660–86.

White, Alan R. (1990). *The Language of Imagination*. Cambridge: Blackwell.

Wicker B., Keysers C., Plailly J., Royet J. P., Gallese V., Rizzolatti G. (2003). Both of us disgusted in my insula: the common neural basis of seeing and feeling disgust. Neuron. 40(3):655-64.

Williams, Daniel (2021). Imaginative constraints and generative models. *Australasian Journal of Philosophy*, 99(1):68-82.

Williamson, Timothy (2000). *Knowledge and its Limits*. Oxford University Press.

Williamson, Timothy (2016). Knowing by imagining. in Amy Kind and Peter Kung (eds.), *Knowledge Through Imagination*. Oxford University Press. 113-123.

Wilson, T. D., & Gilbert, D. T. (2005). Affective Forecasting: Knowing What to Want. *Current Directions in Psychological Science, 14*(3):131–134.

Wiltsher, Nicholas (2019). Characterizing the imaginative attitude. *Philosophical Papers* 48 (3):437-469.

Wiltsher, Nicholas (2022). Imagination as a Process. *Philosophy and Phenomenological Research*.

Winkler I., Cowan N. (2005). From sensory to long-term memory: evidence from auditory memory reactivation studies. *Exp Psychol.* 52(1):3-20.

Wisehart, M. K. (1921). Making your imagination work for you: An interview with Nikola Tesla. *American Magazine* 91 (April 1921): 13, 60–6.

Wittgenstein, Ludwig. (1948/1980). *Remarks on the Philosophy of Psychology, Vol. II.* Edited by G.H. Von Wright and Heikki Nyman. Chicago: The University of Chicago Press.

Yablo, Stephen (1993). Is conceivability a guide to possibility? *Philosophy and Phenomenological Research* 53 (1):1-42.

Zeman A. Z., Della Sala S., Torrens L. A., Gountouna V. E., McGonigle D. J., Logie R. H. (2010). Loss of imagery phenomenology with intact visuo-spatial task performance: a case of 'blind imagination'. Neuropsychologia. 48(1):145-55.