

# **The Actually Possible: An Essay in Modal Psychology**

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# Declaration

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# Abstract

Our beliefs about possibilities and necessities face a problem of justification. This is the problem of modal justification and resolving it has become the holy grail for modal epistemology. For a considerable period, the problem has been approached without consulting our experiences of possibilities and necessities. The thought was that it is part of the nature of possibility and necessity that they transcend experience. In this dissertation, I turn this around. I argue that even though it is part of the nature of possibility and necessity that they transcend experience, we should consult our experiences of possibilities and necessities when trying to resolve the problem of modal justification. More importantly, I argue that when we consult such experiences, especially what is going in our minds when we are having the experiences, we can make significant progress with the problem of modal justification. Consequently, I argue that we can perceive and imagine possibilities and necessities, and that when we investigate the perceptual and imaginative processes involved in experiences of possibilities and necessities, the operations of those processes suffice as the evidence we need to show that we are indeed perceiving and imagining possibilities and necessities. By consulting the tribunal of experience, our beliefs about possibilities and necessities no longer have a justificatory problem.

Izinkolelo zethu ngokungenzeka nezimfanelo zibhekene nenkinga yencazelo. Ukuxazulula lenkinga sekwaba isinkwa semihla ngemihla kwaba hlaziyi bolwazi (epistemology). Esikhathini eside, lenkinga yayibukwa ngaphandle kwesipiliyoni sokungenzeka nezimfanelo. Lomcabango wawuthi ingxenye yendlela yokungenzeka nezimfanelo kuguquka kweqele isipiliyoni. Kulolucwaningo, ngizukuguqula konke lokhu. Ngizoveza iphuzu lokuthi noma ngabe kuyingxenye yemvelo yokungenzeka nezimfanelo ukuthi kuguqukele kusipiliyoni, kufanele sibuze izipiliyoni zethu kanye nezimfanelo uma sizama ukuxazulula le nkinga yencazelo. Okubaluleke kakhulu, ngizohakambisa iphuzu lokuthi sibuze isipiliyoni, ikakhulukazi kulokhu okwenzeka ezingqondweni zethu uma kukhona esikwenzayo, singakwazi ukuyixazulula ngempumelelo inkinga yencazelo. Ngiphinde futhi ngiqhakambise iphuzu lokuthi singabuka siphinde sicabange okungenzeka nezimfanelo, futhi uma sicwaninga indlela yokubuka neyokucabanga efaka isipiliyoni sokungenzeka nezimfanelo, indlela okwenzeka ngayo ivela njengobufakazi esibudingayo ukuveza ukuthi impela siyakucabanga okungenzeka kanye nezimfanelo. Ngokubheka isipiliyoni, ziyashabalala izinkinga ezibhekene nokuchaza izinkolelo zethu.

# Critical Précis

This dissertation attempts a resolution of the problem of modal justification. Beliefs about modality have the problem of justification because they concern states of affairs that are not actual. As a result of this non-actuality, evidence for modal beliefs is difficult to come by, precisely because what counts as such evidence is assumed to be some facts about those non-actual states of affairs, such that describing the non-actual states of affairs takes precedence in attempts of resolving the problem of modal justification. This is the rationalist approach for resolving the problem of modal justification.

In this dissertation, I develop an account that attempts to resolve the problem of modal justification without giving precedence to the nature of non-actual states of affairs. Rather, the approach gives precedence to the processes by which we form beliefs about non-actual states of affairs. While the non-actual states of affairs might be exotic, beliefs about them aren't exotic in any way. For instance, children and even some animals can form some modal beliefs. Probing the processes, which are the same among all subjects who can form modal beliefs, can, therefore, potentially aid the resolution of the problem of modal justification. This sort of approach is empiricist.

This dissertation divides into three parts. Part I sets the stage for this empiricist approach. Part II lays out how the approach enables the resolution of the problem of modal justification by presenting original arguments. Part III rounds off the dissertation by refining the presented original arguments. Part I contains Chapter 1, Part II contains Chapters 2 and 3, and Part III contains Chapter 4.

In Chapter 1, I lay out how my empiricist approach tackles the problem of modal justification. It will incorporate original findings from the natural, life, and behavioural sciences into its investigation of the processes that produce modal beliefs. In Chapters 2 and 3, I put this into praxis by, respectively, considering perception and imagination as such processes. Cognitive-architectural constraints on perception and imagination, I argue, are sufficient evidence for modal beliefs. In Chapter 4, I fortify these arguments by clarifying them, responding to some objections against them, and highlighting some of their implications.

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# PART I

# Chapter 1

## Modal Psychology: Setting Things Up

### 1.1 Introduction

I have many beliefs. One of them is the belief that ‘I could have been a medical doctor’ (and I might have, were it not for logic, which I took as an elective in my freshman year and loved). Besides merely having this belief, it seems intuitive that I am justified in holding it. But there seems to be nothing in real life I can point to as evidence for it. The fact is, I am now a philosopher, not a medical doctor. Similarly, I also believe that ‘two plus two couldn’t equal five’, and intuitively, I am justified in holding this belief. But again, there seems to be nothing in real life I can point to as evidence for it. Even though the outcome is always four when I put two things together with another two things, the *necessity* of this isn’t entailed by these experiments. The problem is this: possibility, impossibility, and necessity are non-actual, and, so, beliefs about them are not straightforwardly justified, and even when some of them, like the ones above, are intuitively justified, their justification is controversial. This is the problem of modal justification, and it is the central question in this dissertation.

Traditionally, resolving this problem has been through *a priori* investigation of what the evidence for modal beliefs is. But, as we have seen, there is nothing in the actual world that could serve as such evidence. To remedy this, philosophers construct possible worlds, sometimes literally (e.g. Lewis 1986) and sometimes figuratively (e.g. Sider 2002), where modality resides, such that emphasis in talks about modal evidence shifts from the actual world to possible worlds. Thus, many modal epistemologies are indistinguishable from modal metaphysics or philosophy of mind. But we were taught in our earliest undergraduate days that epistemology and metaphysics are two different branches of philosophy (ethics being the third), such that any modal epistemology that isn’t concurrently done with modal metaphysics is autonomous and laudable. This dissertation is an attempt in this direction. To clearly lay out my approach for resolving the problem of modal

justification independently of modal metaphysics, let me say one thing about why modal epistemology is often concurrently done with modal metaphysics.

One reason modal epistemology is often concurrently done with modal metaphysics, is that it seems the problem of modal justification can't be satisfactorily addressed without presupposing some form of modal realism. It seems modal justification would cease to be a substantive problem if one is anti-realist about modality. Suppose I hold that modality is merely a consequence of our linguistic conventions (e.g. Sidelle 1989). Under this construal, cashing out the justification of the belief that 'necessarily, all bachelors are unmarried', for example, becomes either trivial or vacuous. The story modal conventionalists tell, is that given existing conventions, being unmarried is part of the meaning of the word 'bachelor', such that knowledge of conventions becomes not mere knowledge of 'bachelors are unmarried', but also of '*necessarily*, all bachelors are unmarried'. This way, the evidence one has for holding the belief that 'necessarily, all bachelors are unmarried', are the conventions that tie necessity down to analyticity. But conventions are fickle, such that nothing intrinsic to them ensures they won't change in some future time.

This is perhaps one reason Lewis (1969) argues vehemently that conventionalism doesn't capture our intuitions about necessity. Quine writes in the foreword to that 1969 work: "In the end, Lewis concludes that the notion of convention is not the crux of this distinction [between analytic and synthetic truths]. He does not for this reason find the analyticity notion unacceptable, however. He ends up rather where some began, resting the notion of analyticity on the notion of possible worlds" (Lewis 1969: xii, my brackets). If so, then conventions fail to be sufficient evidence for necessary beliefs. Thus, with modal conventionalism, there cannot be evidence for necessary beliefs. In fact, any form of modal anti-realism, not just modal conventionalism, would face a similar problem with regards to evidence for necessary beliefs. And this is because, as I have pointed out, necessity outstrips facts about the actual world. This way, there is a general worry that it seems to be a direct consequence of modal anti-realism that modality is a function of cognition; i.e., modality is mind-dependent. But I think this is too much psychologism.

There is an intuitive sense in which modality isn't a function of cognition. For example, it seems clear that whether we cognise it or not, 'two plus two couldn't equal five'. But, if instead of this extreme psychologism, a moderate version that seeks to explain only how we form modal beliefs is held, then evidence for modal beliefs could become facts about cognition, and this wouldn't make modality a function of cognition. Modality would be mind-independent, but evidence for modal beliefs would be mind-dependent, and this sort of psychological analysis would be compatible with modal realism. In short, an analysis of modal justification can proceed by probing

cognition to see whether the possibility, impossibility, and necessity that are illuminated by cognition are those that modal realism countenances. Goldman puts it this way: “Provision of a psychological explanation [...] is obviously not a proof that there are no (*de re*) modal facts of an extramental sort. Essentialist objectivism is consistent with the availability of such explanations. Extramental modal facts might even stand in some sort of explanatory relation to the events cited in the psychological explanation” (1992b: 62).<sup>1</sup>

The point here is that having a modal metaphysics when addressing modal justification has some merits, and the modal metaphysics should be realist, if one wants to do justice to modal justification. Thus, my metaphysical assumption in this dissertation will be realist. But since I have said that this dissertation will be a step in the right direction—of separating modal epistemology from modal metaphysics—I won’t rely on this modal realist assumption in any of my arguments, even though the realist metaphysical framework will be compatible with them. For instance, I will explicitly say that one kind of modality is here with us in the actual world. This implies that this kind of modality isn’t a function of our cognition by my standard, and this is being *realist* about modality.<sup>2</sup> One reason I won’t rely on this realist assumption in this dissertation is that, given the endorsed psychological framework, my arguments will be largely *a posteriori*. In which case, employing metaphysical machinery in my argumentations won’t help much. In short, I think the problem of modal justification can be addressed from an *a posteriori* perspective that is realist in framework, without reliance on any metaphysical machinery.

In the remainder of this introductory chapter, I will flesh out this *a posteriori* approach for addressing the problem of modal justification. In section (1.2), I will embark on a brief historical overview of how the way was paved for the approach. I will say that the traditional *a priori* approaches in modal epistemology face some problems, which *a posteriori* approaches, like the one I endorse, do not face. In section (1.3), I will explain how my version of the *a posteriori* approach

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<sup>1</sup> Goldman goes on to give an account of the sort of relation that could somehow be produced by the extramental modal facts. I will skip such details here, precisely because I want to separate modal epistemology from modal metaphysics.

<sup>2</sup> This doesn’t conflict with why philosophers construct possible worlds. Recall that they do so because nothing in the actual world seems sufficient as evidence for modal beliefs. But often, the kind of modality they have in mind isn’t the one I think is here with us in the actual world. I will later divide modality into *basic* and *philosophical* (section 1.5). It is the basic kind that is here with us in the actual world (Chapter 2), whereas, philosophers have the philosophical kind in mind when they talk in terms of possible worlds. When I discuss the philosophical kind (Chapter 3), my arguments will entail that philosophical modality isn’t here with us in the actual world—perhaps they are in possible worlds. But I will say nothing explicit about this. At any rate, just as my explicit position that basic modality is here with us in the actual world implies some form of modal realism, so too does my implicit position that philosophical modality isn’t here with us in the actual world.

differs from the ones on offer. I will say that most of the *a posteriori* approaches on offer are only empiricist, whereas mine isn't just empiricist but also naturalistic. In section (1.4), I will characterise my brand of naturalistic approach to modal epistemology. I will differentiate it from the other two kinds of naturalised modal epistemology on offer. In section (1.5), I will discuss the specific way I intend to utilise my kind of naturalism in resolving the problem of modal justification; i.e., I will lay out the general argumentative strategy for this dissertation. In section (1.6), I will motivate the naturalistic project I want to embark on in this dissertation, by discussing some prospects to be had if the project is successful. Section (1.7) summarises the chapter.

## 1.2 Rationalism vs. Empiricism

Although modal epistemology is a modern field of research, it is traceable to the ancient and medieval eras, notably, in the works of Aristotle<sup>3</sup> (Denyer 2000) and Boethius (Alanen and Knuuttila 1988), respectively.<sup>4</sup> In the modern era, modal epistemology is often said to have begun in the works of René Descartes (1641), particularly, in his principle of conceivability. The principle is that whatever that can be conceived clearly and distinctly is true. Put differently, if you can conceive an idea clearly and distinctly (after surviving being subjected to methodic doubt, of course), then it is true. Hence, he concludes, for example, that the belief about his existence is true—he can clearly conceive himself as existing because the idea has survived the methodic doubt; so, it is true that he is existing. The philosophical lesson that ensued from this Cartesian principle is that reason alone is sufficient for establishing the truth of propositions and beliefs. Applying this to modal epistemology, reason, particularly conceivability, came to be regarded as sufficient for establishing the truth of modal beliefs, and, thus, began the rationalist movement in modal epistemology.

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<sup>3</sup> For example, in *De Caelo*, we find a notion of modality as non-contradictoriness, in *De interpretatione*, as changeability, in *Prior Analytics* and *Metaphysica*, as potency, and in *Posterior Analytics* as accident. Even though these notions are not fully compatible with one another, in that no generally accepted historical reconstruction thus far has pieced them into a coherent theory, Aristotle's notions of modality serve as the foundation of many contemporary philosophical discussions on the epistemology of modality (e.g. Waterloo 1982).

<sup>4</sup> As ancient Greek thought filtered into Medieval Latin West scholastic philosophy, Boethius picked up Aristotle's modal notion of potency (see Alanen and Knuuttila 1988), which was given in *Prior Analytics* and *Metaphysica* (see fn. 3, above). According to Boethius, possibility as potency refers to tendencies, the realisations of which may be either actual or non-actual at the moment of utterance. Where the potencies that are never unrealised are necessarily actual, those that are not actualised but realised (perhaps, in another history other than ours) exist potentially. See Boethius (*In Periberm* II: 453–5) for more on this, and Alanen and Knuuttila (1988) for a recent discussion. Residues of this thought are noticeable in Descartes' work, which kick-started the formal study of modal epistemology.

Outside modal epistemology, while rationalism was taking hold in the philosophical climate of the 1700s, a different philosophical method was brewing on the other side of the English Channel (Vanzo 2016). This new philosophical method was epitomised in the formulation of the notion of *tabula rasa* by John Locke.<sup>5</sup> This formulation captures the idea that the only knowledge humans can have is based upon experiences, and, so, reason alone was no longer regarded as sufficient for establishing the truth of propositions and beliefs; experience became another player. Reinhold (1791/1985) sums up the concurrent development of rationalism and empiricism in the 1700s nicely: “The insufficiency of empiricism brought about rationalism, and the insufficiency of the latter sustained the other in turn” (1985: 10). But despite the development of empiricism, conceivability was still the only game in town for modal epistemology.

For instance, despite his strong empiricist orientations, David Hume, whose is very influential in modal epistemology, thinks conceivability is our epistemic access to modal facts. He writes:

‘Tis an established maxim in metaphysics, *that whatever the mind clearly conceives includes the idea of possible existence*, or in other words, *nothing we imagine is absolutely impossible*. We can form the idea of a golden mountain, and from thence conclude that such a mountain may actually exist. We can form no idea of a mountain without a valley, and therefore regard it as impossible (*Treatise*: 1.2.2.9<sup>6</sup>).<sup>7</sup>

Effectively, Hume is an empiricist and anti-realist about conceivability; whereas, Descartes is a rationalist and realist about it. Importantly, Hume is a concept empiricist in that he thinks all concepts are derived from experience. Hence, his argument that any manner in which we can fit our concepts together implies some kind of possibility, and any manner in which we cannot fit them together implies some kind of impossibility (Weintraub 2007). But concepts, being directly formed from experience, contain no sense of possibility, since experiences are constructed from simple impressions—single colours, shape, smells and so on—which are exhausted by the actual.

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<sup>5</sup> Although, a different tradition traces the notion to the 11<sup>th</sup> century in the works of Avicenna. See, e.g., Gutas (2012).

<sup>6</sup> ‘Treatise’ stands for *A Treatise of Human Nature*. The four digits after it stand for the book, part, section, and page of the work.

<sup>7</sup> Berto and Jago (2018) think this Humean maxim is wrong about the imaginability of impossibility. They write: “if mental representations involved in conceivability represent linguistically, then Hume’s maxim cannot even get off the ground. If we make the plausible assumption that linguistic mental representations have at least the same representational power as the expressions of natural languages like English, then of course we can conceive, by linguistically mentally representing it, the impossible. Logically impossible sentences of ordinary English can be perfectly meaningful” (2018: 35–6). I note this here only to set it aside. I will return to it in Chapter 3 when I discuss the imagination of impossibilities. See, particularly, sections (3.2.2 and 3.3.1).

Immanuel Kant, after having read Hume, later takes this up, stating that “experience teaches us that a thing is so and so, but not that it cannot be otherwise” (*Critique of Pure Reason*, B, Introduction, §II). Thus, even though conceivability is also useful for empiricist modal epistemology, it seems not to go very far. At least, not until experience can also teach us that a thing cannot be otherwise. The conflict that arose from this situation is that both rationalist and empiricist modal epistemologies imbibed this Hume-Kantian dictum. Rationalists took from it a confirmation of their stance that reason alone can establish the truth of modal beliefs. Empiricists took from it a concession that “whatever enabling role experience might play in modal justification, it doesn’t play a justificatory role—at least where necessity is concerned” (Fischer and Leon 2017: 2). Thus it was, that rationalist modal epistemologies dominated the modal epistemological scene for a considerable period.

In the contemporary era, rationalist modal epistemologies continued to be conceivability-based (e.g. Kripke 1980; Yablo 1993; Menzies 1998; Chalmers 2002; Giersson 2005). This is, arguably, because conceivability seems so inextricably linked with modality. Shalkowski puts it more forcefully: “Certainly, conceivability, broadly construed, plays an important role in forming modal judgements. It is hard to see how we could get started on the modal enterprise without it” (1996: 282). But problems soon began to surface, curtailing the epistemic status of conceivability. For instance, van Inwagen (1998) argues that it is unclear whether conceivability can ever be sufficiently detailed to capture the remote possibilities that are typically used in sophisticated philosophical argumentations. (I will appropriate one of his examples about purple cows in section (3.3.1).)

As a result of this (and other) problems, rationalist modal epistemologies that aren’t conceivability-based began to surface. First in line was the understanding-based approach (Peacocke 2002; Bealer 2002), then the counterfactual-based approach (Hill 2006; Kment 2006; Williamson 2007), and then the intuition-based approach (Sosa 2000; Chudnoff 2013). But, like their conceivability-based counterparts, they each face similar problems. For instance, Gregory (2017) argues that counterfactual reasoning can only lead a few of us, particularly philosophers, to a restricted form of modal knowledge. Sarch (2010) challenges the reliability of the kind of sophisticated understanding that is supposed to be a guide to possibility. Knobe and Nichols (2008) indicate that philosophical intuitions are by no means universal, but rather peculiar to certain cultures and social classes. In short, rationalist modal epistemologies localise modal knowledge to philosophers by making it esoteric, whereas, our intuition about modal knowledge is that it is global and exoteric—everyone and not just philosophers seem to be able to effortlessly and non-collusively modalise.

Another common feature of rationalist modal epistemologies is that they seem to be unreliable in yielding modal knowledge, such that we might wonder whether they ever accurately track modal facts at all. Roca-Royes (2010) has a nice term for this: she says that rationalist modal epistemologies face a ‘problem of integration’. The problem is that it is difficult to reconcile their epistemology with the metaphysics that the epistemology builds on. Given what rationalist modal epistemologies say about modal metaphysics—that modal justifiers are in possible worlds—it isn’t clear how conceivability, counterfactual reasoning, understanding, and intuition that are mind-dependent, accurately track modal justifiers that are mind-independent. There is an ontological gap between cognitive faculties with which we access modal facts and the fact themselves, and it is not clear how rationalist modal epistemologies bridge this gap. This way, it won’t be far-fetched to say conceivability and its ilk are extraordinary cognitive faculties.

One reason they are extraordinary is because it is difficult to shake off the suspicion that they are supposed to implicitly carry on doing the job that Descartes’ all powerful being was supposed to do in modal epistemology. Since modal knowledge outstrips knowledge about our world, and since thisworldly facts are causally interactive with us, Descartes hinged our ability to have modal knowledge on an all-powerful being, who knows all, who won’t deceive us, and who can make us know things that are causally isolated from us. But since such interposition of an all-powerful being into philosophical explanations is no longer a popular pastime of theories, conceivability and its ilk in modal epistemology, seem to be substituting for this all-powerful being. But if they are extraordinary, then as Nolan notices, they will “raise empiricist and positivist scruples that are never far from the surface in other philosophers [that if] there is a subject matter that would require such powers of discovery in us, perhaps we should suspect that our apparent knowledge of modal matters is a mirage?” (2017: 8). Simply put, rationalist modal epistemologies fail to dispel the widespread doubts about our competence for modal knowledge.

Despite these problems, however, rationalist modal epistemologies are still widely regarded as the only game in town. At least, not unless empiricist epistemologists stop conceding defeat that experience plays no necessary role in modal justification. But to do that, they would have to face Hume head-on, and this hasn’t been satisfactorily done. But let us be clear on what they would have to disagree with Hume about.

Experience, according to Hume, is exhausted by the actual, such that experience cannot play any role in the justification of modal beliefs. Kant’s catchy statement, quoted earlier, which is now popular in the literature, puts this in perspective: “experience teaches us that a thing is so and so, but not that it cannot be otherwise”. To show the non-modality of experience, Hume rejects



objective necessity. On this, he can be read either to have denied strongly that there are necessary connections out there in the world, or weakly that we have the cognitive wherewithal to perceive or grasp necessary connections, should they be out there in the world. While commentators of Hume often sustain this distinction between these weak and strong interpretations,<sup>8</sup> I will collapse them here. Thus, let the weak and strong interpretations constitute what I will call the *Humean metapsychological thesis*.

The Humean metapsychological thesis overtly states that the content of experience is exhausted by the actual, and covertly that we lack the cognitive wherewithal to grasp objective necessity, if such there be. But, as Williamson points out, “since correlative types of objective necessity and possibility are interdefinable duals, [Hume] is calling into question the idea of objective possibility just as much as the idea of objective necessity” (2016b: 460). Thus, the second aspect of the thesis should be reformulated: we lack the cognitive wherewithal not just to grasp objective necessity, but also to grasp objective possibility. If so, then the Humean metapsychological thesis is a form of scepticism about our epistemic competence concerning modal matters in general.

To face Hume head-on, therefore, empiricist modal epistemologies would have to show that experience isn’t exhausted by the actual, and that some of our cognitive capacities, like perception and imagination, can interact with the modal contents of experience. I will leave considerations of this Humean metapsychological thesis and arguments against it to a later time (section 2.2). For now, it suffices that there are scientific sources of evidence, which empiricist-oriented epistemologists have used to argue against the Humean metapsychological thesis. In the next section, I will use one such source to show how empiricist modal epistemologies, in recent times, were able to take a place in the history of the epistemology of modality.

### 1.3 From Empiricism to Naturalism

One scientific source of evidence that has been used by empiricist-oriented epistemologists to argue against the Humean metapsychological thesis is J. J. Gibson’s (1979) work on the psychology of perception. Gibson argues that perception is a relation between the perceiver and the environment, such that the latter provides the former with coping and functional mechanisms, and he dubs these *affordances*. To be clear on what he means by the term, an affordance is neither just a property of the environment nor a psychological (or psycho-mechanical) property of an organism.

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<sup>8</sup> See Kail (2003) for a discussion of the weak interpretation.

The way he sets things up, the range of relations that can be counted as instances of affordances is eclectic. For instance, water affords drinking, the air affords breathing, the ground affords standing, and surfaces afford falling off, and so on (Spurrett 2018). What is evident from this ecumenical list is that affordances are of *possibilities*. Consequently, if perception essentially affords and affordances are of possibilities, then by transitivity, perception, and in general experience, is not exhausted by the actual, as Hume thought. I will say more about affordances in Chapter 2; for now, it suffices that with affordances, philosophers with empiricist orientations have the resources to challenge Hume about the content of experience.

This shift to the thought that the content of experience is not exhausted by the actual was noticed by some philosophers. For instance, Bigelow and Pargetter (1990) argued that modality features in scientific progress, because some tools of science, particularly logic and mathematics are modal in character. Elder (2005) and Kment (2014) gave independent accounts of how we can broaden our understanding of modality if we have a better understanding of experience. Some other philosophers gave theories that can be situated at the intersection where rationalist modal epistemologies gave way to empiricist ones (e.g. Bueno and Shalkowski 2014). These accounts began to set the stage for empiricist modal epistemologies, and it has paid some concrete dividends in that recently, theories from leading contributors in the field of epistemology, which spell out some details concerning how empiricism would work for modal epistemology has been published (Fischer and Leon 2017). Rationalist modal epistemologies no longer has a monopoly over the modal epistemological landscape. In fact, there seems to be areas where empiricist modal epistemologies perform better than their rationalist counterparts.

For example, empiricist modal epistemologies wouldn't face the problem of integration, which their rationalist counterparts face (section 1.2). Recall that the problem of integration is that the epistemology of rationalist modal epistemologies is difficult to reconcile with their metaphysics. But if we do away with possible worlds, and *a fortiori* modal metaphysics, then there won't be a problem of integration at all. While it is not implausible to claim that some or all of the extraordinary cognitive faculties postulated by rationalist modal epistemologies can be empirically studied, empiricist modal epistemologies would do well to prioritise ordinary cognitive faculties, like perception and imagination. Perhaps because unlike conceivability and its ilk, perception and imagination have been extensively empirically researched. With perception and imagination, which need no analysis in the framework of possible worlds, modal epistemology would have much support from the empirical sciences. (I will return to this point about the separation of modal metaphysics from modal epistemology in section (4.4).)

The advantage of gaining support from the empirical sciences is that empiricist modal epistemologies would foster holism in inquiry. Here is how. However diverse and unique our individual researches might be, there seems to be that deep-seated voice at the back of our minds, asking us occasionally how the researches we undertake mesh with (or are relevant to) other researches in different fields. Nolan captures this striving for holism nicely:

Very few if any of our inquiries are methodological islands: and this suggests that discoveries made through scientific methods should bear on questions outside the traditional domains of particular sciences. Likewise, if the answers given by our different inquiries are intertwined, it would be surprising if non-scientific methods resolved some of our questions without bearing on scientific inquiry. If holism about inquiry is correct, our modal investigations will bear on traditional scientific questions and vice versa: so, methods appropriate for resolving scientific questions would have to be relevant for modal inquiry, at least indirectly (2017: 12).

One upshot of this striving for holism would be a naturalistic movement à la Quine, which “asserts that all claims of epistemic access must be given an account according to which it becomes possible for humans, living in a natural world, to come to know facts about the objects of these claims” (Pelletier et al. 2008: 5–6). (Now, before we proceed any further, let me disclaim that when I mention Quine in my explanation of ‘naturalised epistemology’, I read his 1969 seminal paper very moderately. I will codify this disclaimer in a couple of paragraphs shortly, but it must be clear from the very get-go that I do not endorse fully Quinean-style naturalism.) Thus, empiricist accounts that are naturalistic will put much emphasis on findings from empirical sciences about our psychology. (I take empiricism and naturalism to be quite distinct in that while all naturalists are empiricists, not all empiricists are naturalists. I will say more about this shortly.)

Unfortunately, despite being empiricist, very few accounts in the aforementioned collection (Fischer and Leon 2017) are naturalistic. In fact, in some ways, most of them tend to lend support to rationalism about modal epistemology. Consider the following introductory remarks from the editors about some of them: “Tahko’s view, then, is a kind of hybrid approach to modal epistemology, which he calls ‘empirically-informed modal *rationalism*’ ... Joshua Rasmussen offers a conservative, actuality-centric form of *rationalism* ... In Thomas Kroedel’s chapter, he develops [a] framework within which our modal knowledge is explained by our knowledge of *counterfactual*

*conditionals*” (Fischer and Leon 2017: 4–6, my italics). Thus, it seems that the hold of rationalism over modal epistemology shines through in most of the accounts. One way to break this hold is by being naturalistic in a moderately Quinean way. This would involve listening to the advances of cognitive science, cognitive neuroscience, cognitive psychology, and evolutionary psychology and see whether modal epistemology can be illuminated by them. Empiricist modal epistemology can also be naturalistic. But what does this sort of ‘naturalism’ come to?

Generally, naturalism comes in different shades. For some philosophers, naturalism is a doctrine (e.g. Quine 1969; Jenkins 2008); for some others, it is an approach (e.g. Maddy 2000); and for some others, it is an attitude (e.g. Nolan 2005), and it is difficult to pinpoint the determinant factors for these different usages of the concept. As Jenkins puts it: “Most (perhaps all) naturalisms have something to do with natural [and other] sciences. But it is hard to identify much by way of more substantive commonalities” (2013: 275). In this dissertation, I will take naturalism to be an ‘approach’. Nothing much hangs on this terminological choice, except perhaps ease of expression; so, I won’t defend my choice.

As an approach, naturalism can be *metaphysical* or *methodological*. When naturalism is metaphysical, commitments to the object of naturalisation are treated as being of the same order as scientific commitments. It can be anticipated that here, naturalism would go along with some form of physicalism. Even though many philosophers of science agree that physics is modal, at least in the nomological sense, I don’t think such agreement does much by way of relevance for modal epistemology. Modal epistemology involves more than just nomological modality—it importantly involves metaphysical modality—and it is not straightforwardly clear that we can get to the latter from the former.<sup>9</sup> And even if we can, epistemological commitments surely cannot only be nomological ones, some (if not most) of them are deontic.

When naturalism is methodological, the scientific method (now, using this term as encompassing a range of methodologies from natural sciences, through human sciences and life sciences, to social sciences), is used to make sense of our commitments to the object of naturalisation. For modal epistemology, this will involve building a relationship (or tracing out the already existing ones) between psychology, linguistics, neuroscience, and some other relevant science fields to understand modal reasoning. This way, methodological naturalism will simply make “free use of

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<sup>9</sup> But see Williamson (2016b). Although, I don’t think Williamson is metaphysical about naturalism here. For one, his primary concern is modal metaphysics, and that presupposes retaining most of the traditional *a priori* methodology of modal metaphysics. If anything, he is methodological about naturalism. See the next paragraph in the main text for what being methodological about naturalism entails.

whatever scientific findings may suit its purpose” (Quine 1986: 665), in explaining ‘modal’ without reducing it to ‘physical. For instance, it would explain different aspects of modal reasoning by drawing upon mathematics, psychology, and physics to account for modal prediction, modal error, and modal reliability, respectively.

Given the above problems with metaphysical naturalism and some associated ones, which methodological naturalism avoids, most philosophers (e.g. Kornblith 2007; Papineau 2007; Jenkins 2013; Nolan 2017) are more inclined to be methodological about naturalism. I will be also: I will be methodologically naturalistic about epistemology in this dissertation. I will retain some traditional *a priori* methodology for epistemology, but I will incorporate some *a posteriori* findings into my investigation of the epistemological problem under consideration in this dissertation. Now that we have seen what naturalism is, and how it will be used in this dissertation, we can now ask how modal epistemology should be naturalised.

As we have seen, when talk of naturalising *epistemology* surfaces, Quine’s (1969) seminal work is called to mind, according to which epistemology is just a branch of psychology. Consequently, he calls for the replacement of epistemology with psychology. I do not endorse this ‘replacement thesis’.<sup>10</sup> I think epistemology has two jobs: describing and prescribing the standards of epistemic appraisal, and epistemology won’t be able to do these jobs, precisely the prescriptive one, if one endorses Quine’s replacement thesis. After all, it seems that most sciences are descriptive, such that replacing the methodology of epistemology with the methodology of psychology, will block epistemology from performing its prescriptive duties. Consequently, naturalism for me is moderate. See also Goldman (2002) and Feldman (2012) for other versions of moderate naturalism.

My moderate naturalism cooperates not just with natural sciences, but also with life and behavioural sciences. It doesn’t seek to replace the methodology of epistemology with that of psychology. Rather, it retains the methodology of epistemology but takes findings from cognitive science, cognitive neuroscience, cognitive psychology and evolutionary psychology very seriously. This would enable me retain the prescriptive task of epistemology.<sup>11</sup> I won’t just be describing the ways in which some of our cognitive faculties interact with the modal contents of experience; I

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<sup>10</sup> See Kornblith (1985) for a critical assessment of this thesis.

<sup>11</sup> Some philosophers, e.g. Quine (1960), think naturalised epistemology cannot be prescriptive, because by being naturalistic, it is committed to scientific commitments which are often only descriptive. Kim responds that Quine gives up too quickly in that “There must be a reason for [a belief], and this reason must be grounded in the factual descriptive properties of that particular belief” (1988: 399). If so, then naturalism is compatible with prescriptive naturalised epistemology. In fact, Audi (2013) recently argues that a naturalistic story might just be the best way of cashing out the prescriptivity of epistemology. Consequently, many philosophers (e.g. Goldman 1992a; Kitcher 1992; Kornblith 2007; Lyons 2009) have offered different ways naturalised epistemology can be prescriptive.

will also be specifying the conditions under which such interactions are epistemically justifying. More importantly, my arguments will imply that when those faculties are used under the specified conditions, the epistemic agent would have done the right thing, and we can tell that she has because her modal beliefs would be justified. And I take this task to be a prescription. Having seen how modal epistemology should be naturalised, let us consider the form naturalised modal epistemology would take in this dissertation.

Nolan (2017) gives three ways one can be moderately naturalistic about modal epistemology: by considering the (i) psychological underpinning of modalising, (ii) semantic behaviours of modal expressions in natural languages, and (iii) success of scientific theories and then making modal analyses a function thereof. Nichols (2006a) undertakes a study from the perspective of (i); he calls it *modal psychology*. Kratzer (2012) and Williamson (2016b) give accounts of (ii) and (iii). Let us, for lack of better terms, call the accounts they give *modal linguistics* and *modal scientism*, respectively. Modal psychology and modal linguistics hope to settle difficult questions about modality by asking why we modalise and by examining the linguistic structures of modal terms, respectively. Modal scientism takes an indirect route: from the importance of modality to our best scientific theories, through our understanding of those theories, to the hope that we might understand some things about modality from the understanding of our best scientific theories.

This dissertation, as given away by its title, is an essay in *modal psychology*. Its chief aim is to demonstrate how the cognitive processes that produce modal beliefs provide justification for the beliefs they produce. It seeks the psychological underpinning of modal reasoning for all forms of alethic modality in both practical and philosophical usages. More sophisticatedly, it asks whether the processes that produce modal beliefs have any justificatory power or play any justificatory role in both practical and philosophical modal reasoning. To reiterate what I have said earlier (section 1.1): modality is mind-independent by my account, but evidence for modal beliefs isn't. Thus, this research is not just empiricist about modal epistemology, it is also naturalistic in that it is psychologically informed. Much ink may have been spilled on psychologically informed epistemologies, but little has been said about psychologically informed *modal* epistemologies. This dissertation aims at spilling some ink on a psychologically informed modal epistemology. In the next section, I will conceptualise modal psychology so as to identify how it would be helpful for the task in this dissertation.

## 1.4 Conceptualising Modal Psychology

As we saw in the preceding section, Shaun Nichols coins the term, ‘modal psychology’. According to him, modal psychology asks, “What is involved, psychologically, in making modal judgments?” (2006a: 237). He explains that even though it is plausible to assume that philosophers entertain this question, they sometimes treat its answer, i.e., modal psychology, as a shameful relative of modal metaphysics and modal epistemology. But, in his view, modal psychology should be treated as a legitimate and promising avenue to resolve some of the traditional problems. Consequently, I will take modal psychology to be a subfield of modal epistemology in this dissertation.

Daniel Nolan is another philosopher who has discussed modal psychology. This is what he says: the “investigation of ourselves and our capacities to respond to the world might indirectly shed some light on what we are responding to when we get the modal facts correct. The investigation of modality could thus benefit from a more systematic study of the *psychology* of modal judgements” (2017: 19, my italics). What is clear from both Nichols’ and Nolan’s independent discussions, is that modal psychology would have much to do with our psychological makeup when we modalise. But to be clear on what constitutes our psychological makeup when we modalise, we would have to investigate, at least, (i) incipient modalising in children, and (ii) the mechanisms with which we form modal beliefs. Let us call (i) modal psychology qua developmental study, and (ii) modal psychology qua study of mechanism.

Modal psychology qua developmental study investigates the beginning and development of modal reasoning, particularly by studying the psychology of children when they modalise. The idea is simple: If we can understand how children come to modalise, then we can construct a theory of how modalising develops in average humans. Consider object-permanence as an example. Children begin to have a sense of object-permanence at about 8 months old (Piaget 1954; Ryu et al. 2017).<sup>12</sup> It is plausible then to say that the ability to understand object-permanence underlies some practical modal reasoning that is indispensable in hide-and-seek games (cf. Buchsbaum et al. 2012). Children understand that not-being-seen is not tantamount to not-existing, and this might explain why they are able to form modal beliefs, like ‘If I hide behind the door, I can’t be seen’. Of course, one can argue, à la Hume that this is mere habit, and so, there is no modal reasoning here. I will mount a campaign against this line of thought in sections (2.2, 2.4.1, and 4.2.1).

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<sup>12</sup> Spelke reports similar findings about 2-day old chicks: “Chicks selectively approached the connected object, providing evidence that they, like human infants, had perceived the imprinted object to continue behind its occluder” (2003: 283).

The significance of modal psychology qua developmental study should not be underestimated. For example, even though it isn't a popular worry, it is unclear whether or not there are cases of modal pathologies. Suppose that there are people who are modally blind and can't make modal discriminations. Perhaps someone along the line of Wright's (1980) 'cautious man' who accepts all empirical truths but refuses to add modal values. Or someone along the line of Quine's (1960) fictional character who refuses to prefix logical truths with 'necessary', or Blackburn's (1987) fictional character who cannot fathom contingency. Modal pathological cases are potentially illuminating because in non-modal settings, pathological cases have been illuminating. For instance, much has been learnt from agnosia (the loss of object recognition), aphasia (the loss of language comprehension), aphantasia (the loss of mental imagery), prosopagnosia (the loss of face-recognition ability), and so on. Thus, if we discover that there are real cases of modal pathologies, we might learn interesting things about ourselves. (I will return to such cases in sections (1.5 and 2.2).) In short, whether modalising is a human universal, or perhaps an approximate human universal might be made clear by modal psychology qua developmental study.

In addition, modal psychology qua developmental study may resolve the popular worry of why we exoterically and effortlessly modalise. If modalising is inbuilt, then it does not require that any other cognitive processes be triggered, such that little or no energy is expended when we modalise. Modal psychology qua developmental study may also lead to a better understanding of when humans start forming complex modal judgements. It may also clarify how children's hypothetical reasoning differs in complexity from adults'. Simply, a study that critically analyses how, when and why modalising develops might be beneficial to our understanding of modal matters. Of course, this is all provided that modalising tracks something veridical. But despite these merits of modal psychology qua developmental study, I suspect it won't help much with addressing the problem of modal justification. This is because modal psychology qua developmental study works primarily on incipient modalising in small children, and children seem to lack the concept of evidence. Generally, an account of epistemic justification that has children as its main epistemic agents would leave much out. What would benefit any account of modal justification is a study of the processes with which children and adults alike, form modal beliefs. And this is just what modal psychology qua study of mechanism gives us.

Modal psychology qua study of mechanism investigates the processes by which we form modal beliefs. The idea here is this: If we can understand the psychological processes by which we discover modal facts or form modal beliefs, then such understanding may contribute significantly to our knowledge of modal matters. Although, he wasn't interested in modal psychology, Kroedel captures nicely what modal psychology qua study of mechanism is about: "In sum, the project is



to explain modal knowledge from the reliability of *the processes that produce our modal beliefs*” (2017: 181, my italics).<sup>13</sup> One way modal psychology qua study of mechanism is significant is in the possible refutation of the Humean metapsychological thesis (section 1.2). Recall that the thesis concerns the content of experience—that experience is exhausted by the actual—such that our competence in judging modal matters is unreliable. Thus, one way to ascertain the truth or falsity of the Humean metapsychological thesis is by studying the psychological processes through which experience gets its content.

One such process is perception, and many empiricist-oriented philosophers (e.g. Nanay 2011a; Williamson 2016b; Nolan 2017) are of the opinion that perceptual, and *a fortiori* experiential, content isn’t exhausted by the actual. I have given one reason most of these philosophers hold this position (section 1.3). It was that, given Gibson’s account on the psychology of perception, perception has modal contents. I will say more about this in section (2.2). For now, it suffices that the Humean metapsychological thesis seems wrong given what we now know about the psychology of perception. Nolan puts it best:

The literature on perception of modal matters has important epistemological ramifications in another way. One of the pressures towards a distinctive epistemology of modality is the traditional empiricist thought that the senses can only tell us what is the case, not what must be the case or what is non-actual yet possible. If we perceive mere possibilities, then this thought is mistaken at its root, and we can treat modal information about the world more like information about mass or colour or distance (2017: 20).

It follows, then, that one way modal psychology qua study of mechanism would be significant is in addressing some phenomena about perception, which would have otherwise been puzzling.

Consider depth perception, for instance. It could be a puzzling phenomenon if one doesn’t understand the psychology of (binocular) vision. One might wonder how we see in 3D and not in 2D. But once one understands the psychology of vision, depth perception ceases to be puzzling. Depth perception typically occurs due to parallax, which is generated by the overlapping of two streams of visual information from our retinæ. This sort of psychological understanding explains away the puzzling nature of depth perception. More importantly, the understanding would tell us when depth perception is reliable and when it isn’t. For instance, we know depth perception isn’t

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<sup>13</sup> He was interested in an evolutionary project for a conceivability-based approach in modal epistemology.

reliable for judging the distance of stars, because stars are just too far away for the eyes to generate any reasonable parallax from the relevant visual information. This also explains why stars look to be at the same distance to us: because they are just outside the operating range for parallax generation by the eyes.

Another significance of modal psychology qua study of mechanism is in the resolution of the problem of modal justification. One natural place for this is in reliabilism, the epistemological approach that emphasizes the truth- or justification-conduciveness of a belief-forming process (Goldman 1986). Since reliabilism operates on the reliability of the belief-forming processes, understanding those processes becomes indispensable to reliabilism, and modal psychology qua study of mechanism would foster this understanding. We have seen that the idea that perception has modal contents is no longer anathema among most empiricist-oriented philosophers, such that the concomitant idea that perception produces some of our modal beliefs is now a popular pastime among those philosophers. If so, then understanding the psychology of perception would be indispensable to a reliabilist project about modal justification. In short, modal psychology qua study of mechanism is significant, because with it, the concession that experience plays no necessary role in modal justification can be relinquished.

This dissertation will be a research in modal psychology qua study of mechanism, and as a result, the ensuing account of modal justification will be reliabilist. Precisely, it will be process reliabilist account as against virtue reliabilist one, where the former focuses on the processes that produce belief, and the latter, on whether the epistemic agent competently uses the relevant belief-forming processes.<sup>14</sup> I will say a little more about process reliabilism in section (3.3), but I think this general overview, though short, is sufficient for the task ahead. This way, my modal epistemology will be externalist, i.e., I won't prioritise whether or not we are aware of the justificatory grounds for modal beliefs.<sup>15</sup> In this way, even though the account won't be taking children as its epistemic standard, as it would have were it a project in modal psychology qua developmental study, it will accommodate them. In addition, by being externalist, the account will apply to non-human perceivers as well, whether they lack the concept of evidence as in the case of some non-human animals (e.g. Burge 2003), or lack awareness as in the case of zombies (e.g. Lyons 2009), or we are uncertain about their cognitive capabilities as in aliens (were they to exist) (e.g. Bergman 2013). Insofar as they can all *experience* their environment; they are fair game.

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<sup>14</sup> See Goldman and Beddor (2016) for a disambiguation of reliabilism.

<sup>15</sup> Reliabilism can also have internalist flavours. For instance, Alston (1988).

The relevant question then is this: Which psychological processes are implicated in modalising? There are many options. We have encountered some earlier—the extraordinary ones; i.e., conceivability, counterfactual reasoning, understanding, and intuition—which rationalist modal epistemologies propose (section 1.2). But not to advance the course of the rationalists, as most non-naturalistic empiricist modal epistemologies tacitly do (section 1.3), let us steer clear of these extraordinary psychological processes. The relevant question then should be rephrased: Which *ordinary* psychological processes are implicated in modalising? I have already implicated perception. Imagination is another. In fact, perception and imagination are the processes Nichols and Nolan isolate in their independent trail-blazing discussions of modal psychology: imagination for Nichols and perception for Nolan. I will use both here.<sup>16</sup> Here then is the hypothesis I want to defend in this dissertation:

*Reliabilist modal justification:* Perception and imagination are among the processes with which we form modal beliefs, and by investigating them, we can have insights into whether they play any justificatory role in the formation of modal beliefs.<sup>17</sup>

But, before we continue, a quick refinement of ‘perception’ and ‘imagination’. A state qualifies as perceptual if it depends on sensory inputs and is factive. A state qualifies as imaginative if it is speculative, depends on other mental states as inputs, and is not constrained by truth. (I will say more about perception and imagination in Chapters 2 and 3, respectively.) One important difference between perception and imagination then is their content. Perceptual content is not under our control, but imaginative content, at least to some extent, is. When you open your eyes, you can’t control what you see, whereas, you can control, to some degree, what you imagine. In addition, imaginability and conceivability are often used interchangeably (e.g. Yablo 1993; Chalmers 2002; Kung 2010), and I think there is no conflict in doing so, even though conceivability is associated more with rationalist modal epistemology than imaginability. Nonetheless, I will rarely use them interchangeably in this dissertation. I will speak in terms of imagination and imaginability. Having clarified ‘perception’ and ‘imagination’, we can now ask: In what aspects of modality are perception and imagination implicated?

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<sup>16</sup> Nichols himself creates a room for this sort of merger. He recognises that the modal psychology he considers, is only a portion of what can be said about modal psychology: “We now have in place a naturalistic sketch *of a portion of our modal psychology*” (2006: 251, my italics).

<sup>17</sup> The perceptual- and imagination-based justification accounts I will defend in Chapters 2 and 3 directly addresses this hypothesis.

Generally, modality can be divided into two broad categories. Although, different labels have been used for the two categories,<sup>18</sup> I will, for the purpose of this dissertation, use *basic* and *philosophical* modalities. Basic modalities are those that seem to be useful for everyday reasoning and acting. Here are some examples:

- (a) Don't stand in a slippery bathtub since you *might* fall.
- (b) I *can't* reach the mug on the table.
- (c) Murder is objectively unethical, so you *mustn't* do it.
- (d) Having a moral code is beneficial since it *might* forestall unethical behaviours.

Basic modalities often include nomic and deontic modality: (a) and (b) are nomic, whereas, (c) and (d) are deontic. They concern possibility as with (a) and (d), and necessity as with (b) and (c). If we consider these examples through the perspective of perception and imagination, we would see that imagination is implicated in all of them, but perception isn't. Even if you agree that we can perceive some modalities, it would be overstretching the matter to say we can perceive (d). Perception, if you agree that it can deliver some modalities, can deliver only (a), (b), and (c), but not (d). Thus, while perception is limited with regards to basic modalities, imagination isn't. In most quarters, basic modality is called 'practical' modality, but I won't use that label here.

Philosophical modalities are those that often occur in sophisticated philosophical and scientific reasoning. Here are some examples to put things into perspective:

- (e) It is *possible* that zombies exist.
- (f) The Higgs Boson *could* exist in a 10-dimensional plane.
- (g) There are *impossible* objects.
- (h) *Necessarily*, existence is a perfection.

Philosophical modalities often include epistemic, conceptual, and metaphysical (but can also include all other forms of) modalities. Philosophical modalities concern possibilities as with (e) and (f), and necessity as with (g) and (h). Following an accepted practice in metaphysics, philosophical modalities extend beyond the actual world, spilling over into possible and impossible worlds. This makes the limitation of perception vivid: we can't get to any from (e) to (g) with perception. That is, even if we can perceive some kinds of basic modality (see the preceding paragraph), it is highly unlikely that we can perceive any philosophical modality. But we can surely

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<sup>18</sup> Van Inwagen (1998) has *basic* and *absolute* in the sense of distance: basic modality is closer to us than absolute modality, which are far away in possible worlds. Divers (1999) has *basic* and *advanced* in the sense of spatiotemporal location and unification: basic modality is spatiotemporally located and unified in a place, whereas, advanced modality is spatiotemporally non-located and separated spreading across many places.

imagine all of them—imagination can get us to and back from possible and impossible worlds. The stipulation of imagination as our epistemic access to philosophical modality seems to be at home with most philosophers of modality. For instance, Williamson (2007) gives an account of how imagination can yield philosophical modal knowledge.

While philosophical modality, as I have explained it here, comes close to what is called ‘metaphysical’ modality, metaphysical modality isn’t synonymous with philosophical modality. When philosophers use ‘metaphysical modality’, they maintain a distinction between epistemic, conceptual, and metaphysical modalities, even though the former two can be regarded as a subset of the latter. I intend to capture all three kinds of modalities, hence, my usage of ‘philosophical’ instead of ‘metaphysical’ here, to forestall any sort of equivocation. In addition, I intend to capture not just the usage of modality in sophisticated philosophical reasoning, but also in sophisticated scientific reasoning, and ‘metaphysical modality’ isn’t always extended to scientific usage of modality. At any rate, imagination is directly implicated in philosophical modality.

In sum, perception and imagination seem like plausible avenues to empirically study basic modality, but only imagination looks to be promising for philosophical modality. To sufficiently undertake a psychological study of modality, therefore, this division of labour should be the strategy. However, such study will take more space than available for this dissertation. Consequently, I will limit the investigation of basic modality to perception alone and dedicate imagination to philosophical modality. Moving forward, I will say BM-*x* or PM-*x*, where ‘BM’ and ‘PM’ are short for ‘basic modal ...’ and ‘philosophical modal ...’, and ‘*x*’ is a place-holder for any noun that’s useful for the ongoing analysis. We are better placed now to state the targets of this dissertation:

**First target:** In what ways does perception justify BM-beliefs?

**Second target:** In what ways does imagination justify PM-beliefs?

I will address the first target in Chapter 2, and the second target in Chapter 3. But before we get to that, let me briefly discuss the argumentative assumptions of these research chapters. I have said my approach will be reliabilist and externalist in that children, some animals, zombies, and even aliens become subjects that can form BM-beliefs, insofar as they can form perceptual beliefs. For PM-beliefs, I think zombies are the only non-human subject that can form them. I have also said my approach will be naturalistic<sup>19</sup> (section 1.3). How these two assumptions will guide my argumentations throughout this dissertation is the focus in the next section.

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<sup>19</sup> To remind ourselves, naturalism, for our purpose, is broadly cooperative with science.

## 1.5 From Cognitive Science to Modal Psychology

The mind is a complex entity, with distinct components. The distinctness of these components is evident in the fact that some of them can be damaged, and the functioning of the rest will remain almost intact, as evident in prosopagnosia, aphasia, aphantasia, and agnosia, for example. One interpretation of these phenomena is that components of the mind are *modular* in nature, in that they are functionally dissociable from one another. Although there are many definitions of what modules are, Fodor's (1983) is a good starting place. According to him, a system qualifies as a module if (i) it is domain specific, (ii) it has non-conceptual outputs, (iii) it is encapsulated and inaccessible, (iv) it is innate, and (v) its internal operations are swift.

Briefly, (i) means that a module is restricted to the kinds of content it takes as input, e.g., the visual system is restricted to visual inputs; (ii) means that the outputs of a module are shallow in that they don't issue in thoughts and beliefs; (iii) means that the operation of a module is isolated from the rest of cognition, and that other modules can't have access to it; (iv) means that the development of a module is under significant genetic control and each module is realised in specific neural structures; (v) means that the operations of a module aren't under voluntary control. Candidate modules of the mind include the perceptual module, the inference module, the mind-reading module, the face-recognition module, and so on, but not the imagination module. Since we have no organ directly subserving imagination, it is highly unlikely that we have an imagination module.<sup>20</sup> Although Fodor's definition is a good starting place in the discussion of modularity, some of its elements have been challenged over the years. For our purposes, I will focus on (ii).

As we saw, Fodor thinks that no module has conceptual outputs. But that is precisely what we need for modules to feature in the epistemology of beliefs—they must be capable of outputting thoughts and beliefs. Carruthers' (2006) account of modularity, for example, allows this. Carruthers argues that not all modules require the cooperation of non-modular systems for their outputs to issue in thoughts and beliefs. This is because in recent times, evidence has surfaced that we have modules subserving common-sense physics or common-sense biology, and this would require that the outputs of such modules be fully conceptual thoughts and beliefs. Building on this idea, accounts that postulate conceptual modules have been surfacing. For instance, perceptual module/systems, and in some ways, language systems have been said to be conceptual, such that lessons about their modularity might illuminate my modal psychology.

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<sup>20</sup> But I think we have imagination systems. See section (3.2).

Lyons (2009) argues that since the architecture of perceptual systems is patently affected by learning, it is highly plausible that thoughts and beliefs are sometimes outputs of perceptual systems. He writes: “A perceptual system is, in the first instance, a module that starts with the transduction of energy by some sense organ and produces beliefs or other relatively high-level representations as outputs” (Lyons 2009: 92). If Lyons is correct, then it isn’t misguided to say, as I have suggested but yet to show (section 1.4), that we form BM-beliefs on the basis of perception. This way, one can incorporate findings from the empirical sciences that study perception in an account of how perception justifies BM-beliefs. This is basically what I will do in Chapter 2.

Chomsky (1995) famously suggests that language systems divide into three main components: a comprehension system, a production system, and a knowledge base of grammatical and phonological rules that underlies the operations of both systems. The comprehension system seems to be conceptual, since speech acts begin from *thoughts* (Levelt 1984)—it would take these initial thoughts as inputs. The production system seems to be conceptual also, since it would take inputs from the comprehension system and output thoughts, in mental or overt speech. These outputted thoughts are then broadcasted to some other systems that the language systems subserve, for example, the imagination systems. Given this, it isn’t misguided to say, as I have said (section 1.4), that we form PM-beliefs on the basis of imagination. This way, one can incorporate findings from the empirical sciences that study imagination in an account of how imagination justifies PM-beliefs. A version of this is what I will do in Chapter 3.

But it might be said that the modularity of perceptual and imagination systems isn’t performing any epistemic tasks here. Rather, the mind taken as a whole is what is doing the job. I think the modularity of perceptual and imagination systems are epistemically significant to my modal psychology. Here is how. Belief-formation can still occur when there are damages to memory, face recognition, language, and reasoning systems. Intuitively, an aphantasic or amnesic or aphasic should be able to form both BM- and PM-beliefs even though mental imagery, memory, and language, which they respectively lack, play some roles in modal reasoning. If so, then modularity becomes ampliative to the epistemic significance of perceptual and imagination systems (see particularly section (2.2.2).) In short, we need modularity to ensure that the epistemic load is being carried by the relevant cognitive systems, and not by the mind, taken as a whole. For if it is the mind taken as a whole that’s doing the epistemic job, then we might as well give up on our reliabilist dream. The relevant question then, is whether perceptual and imagination systems can carry the required epistemic load in modal justification.

For perceptual and imagination systems to carry the required epistemic load in modal justification, they must be constrained by epistemic norms. But they can't be so constrained if they aren't reliable systems. So, the first question is this: How should we determine the reliability of perceptual and imagination systems? One way is by ascertaining whether they are regulated by any discernible rational standards.<sup>21</sup> If they are, then they would feature in the justificational etiology of beliefs: "it seems plausible that it is essential to *beliefs* that they are causally regulated by certain standards of rational or justified belief" (Wedgewood 2013: 154). Intuitively, perceptual and imagination systems are regulated by some rational standards. I can move around an occluded object to confirm whether it is what I perceived it to be. Likewise, J. K. Rowling can say the following about your imagination: "No, Harry Potter can't do what you imagined him to have done".<sup>22</sup> If so, then perceptual and imagination systems are constrained by truth.<sup>23</sup> In short, the norms that constrained them aren't just rational, they are also epistemic (Goldman 1979; Pollock 1987).

I should clarify that even though modularity is important to my overall argumentative strategy, the resultant account of perceptual modal justification (Chapter 2) won't just be a *mutatis mutandis* replica of the resultant account of imaginative modal justification (Chapter 3). In fact, the notion of modularity that would be relied upon in both accounts might not even be the same. For instance, there are, uncontroversially, perceptual modules, but, as I have said, there are no imagination modules. Nonetheless, in Chapter 3, I will couple together modules from different systems to assemble what I will call (and have been calling) 'imagination systems'. The point here, is that we can't just replace 'perceptual systems' with 'imagination systems' in the resultant perceptual modal justification account and get an imaginative modal justification account, or vice-versa. Both accounts, to reemphasise, will be independent of each other, even though they will have common concepts. In Chapter 4, I will unify both accounts and talk about them in terms of a singular reliabilist account of modal justification.

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<sup>21</sup> The fact that cognitive systems are regulated is well laid out in many cognitivist accounts of our capacities, e.g., pretense (e.g. Leslie 1987) and mindreading (e.g. Nichols and Stich 2003). Whether this regulation follows a simple (e.g. Charniak 1986) or complex (e.g. Dennett 1984) template is a different question altogether. What is important for us, is that there is a template that cognitive systems follow in generating their outputs; i.e., they are regulated.

<sup>22</sup> Compare wishful thinking: even though it is as natural a belief-forming process as perception, we don't accord it the same status we accord perception. We don't because it isn't regulated by any discernible standard.

<sup>23</sup> This might seem to conflict with my definition of imagination in section (1.4). But it doesn't. I clarify this confusion in section (3.3.1). Here is the highlight. The confusion stems from an ambiguity about 'intentionality'. Under the *psychological* sense of intentionality, there is a conflict, but the psychological sense isn't the relevant sense when discussing the epistemic significance of imagination systems. The relevant sense of intentionality is *epistemic*, and under that sense, there is no conflict.



Having laid out the argumentative strategy of this dissertation, we are almost done with laying out the preliminaries. But before we conclude this introductory chapter, let us discuss the prospects of modal psychology. What do we stand to gain by being naturalistic about modal epistemology via taking psychological findings very seriously, except the possible resolution of the problem of modal justification, which I have presented as the selling point of modal psychology here? Why should we embark on modal psychology and not modal linguistics or modal scientism, which are other ways one can be naturalistic about modal epistemology? I answer this questions and other related ones in the next section.

## 1.6 Some Prospects of Modal Psychology

One thing we can expect from modal psychology is the resolution of the problem of modal justification. In section (1.1), I introduced this problem by explaining that it is one of the central problems in modal epistemology, in that it jeopardises our epistemic competence concerning modal knowledge. But, if modal justification is so troublesome, and modal knowledge is as a result, questionable, whence modality's explanatory strength, which makes it important and almost indispensable in many areas of philosophising? It appears that among the three forms of naturalised modal epistemology, only modal psychology can answer this question; both modal linguistics and modal scientism fall short. Here is how.

First, modal linguistics. How modal expressions behave in natural languages may tell us interesting things about modal terms, but why modal terms are so prevalent and ubiquitous would be excluded from the list of these interesting things. Take for instance, the almost indispensable employment of modality in theistic arguments. Now, suppose that, having studied the behaviour of modal expressions in every natural language, we somehow discover why modality is ubiquitous and important in both mundane and sophisticated reasoning. It follows then, that modality's indispensability for theistic arguments would be a function of how modal expressions behave in natural languages. In which case, problems in theistic reasoning would be reducible to how modal expressions behave in natural languages. For instance, our inability to fully comprehend God would become a mere obscurity in how we describe God using our natural languages. But that would be deeply mistaken, as it forces us into extreme anthropomorphism—the nature of God cannot be limited to the descriptions that are possible and/or true given our natural languages. By *reductio* then, modal linguistics cannot tell us whence the explanatory strength of modality.

Modal scientism is also deficient in a similar way. It is true that the empirical confirmability of successful scientific theories trickles down to all its indispensable components (Putnam 1971). And since modality is arguably one indispensable component of successful scientific theories, modality may be empirically confirmed. However, whether this inherited empirical confirmability can tell us how and why modality got to be an indispensable part of successful scientific theories in the first place is contentious. What is not contentious is that the inherited empirical confirmability does not (and, in fact, cannot) tell us why successful scientific theories require modality and not something else—perhaps wishful thinking—as an indispensable part. Put differently, modal scientism cannot tell us whence comes the explanatory strength of modality, even if it might be able to tell us some other interesting things.

However, if we can characterise the psychological underpinning of modal judgement, we would be able to give an account of modality's explanatory strength. Suppose we embark on a research project in modal psychology qua developmental study, and as a result, we are able to show that modality is an (approximate?) human universal (section 1.4). This kind of study would ascertain whether modalising is structurally part of our cognitive structure, perhaps one that is offline<sup>24</sup> in everyday usage. If the study yields this finding, BM-reasoning will be offline, coming to us naturally, automatically, unmediated, and perhaps, unconsciously. If this is correct, then the offline status of modalising can be taken as one reason why modalising is so fundamental in many areas of philosophising, in science, and in everyday life. Since PM-reasoning is arguably online, whether this study would also explain the explanatory strength of modality within PM-reasoning might be far-fetched. Nonetheless, that it has the potential to explain the explanatory strength of modality within BM-reasoning would be sufficient prospect.

Similarly, suppose we embark on a research project in modal psychology qua study of mechanism, and we are able to show that experience, via perception and imagination, plays necessary roles in modal justification. This kind of study would ascertain whether modalising is structurally fit to constitute part of our foundational knowledge, assuming foundationalism<sup>25</sup> about knowledge is true. After all, it is accepted in most quarters that knowledge based on experience is foundational knowledge. If so, then the foundational status of modalising may be taken as one reason modalising is so fundamental in many areas of philosophising, in science, and in everyday life.

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<sup>24</sup> Here, as it is customary in psychology, *offline* is used in contrast with *online*, and they are used to capture the respective conscious and unconscious utilisation of our cognitive system.

<sup>25</sup> Foundationalism is the traditional epistemological doctrine that, regress in epistemic justification is stopped, only if there is a basic belief or experience that is not itself in need of justification. In a way, the perception-based account I will defend for justification of basic modal beliefs is foundationalist. See fn. 18 in Chapter 2.

Since I hope to show, in this dissertation, that experience, via perception and imagination, plays a necessary role in modal justification, we can hope that this dissertation, by being a research project in modal psychology qua study of mechanism, will explain not only the explanatory strength of modality within BM-reasoning, but also within PM-reasoning.

Another prospect of doing modal psychology is the vindication of modal intuition. It is not news that one major tool for doing philosophy is intuition (e.g. Sosa 2009), and that philosophical intuition has been one of the major sources of criticism in the debate between science and philosophy. It is also not news that while the latter relies on intuition, the former relies on observation and experimentation. One aphorism that pops up often in this debate is this: To what extent should we trust philosophical intuitions? Even within philosophical circles, philosophical intuitions are often met with incredulous stares (e.g. Knobe and Nichols 2008). Take for instance, the intuition-based accounts of modal epistemology (e.g. Chudnoff 2013). Friends of these accounts might take it that they are systematising Kripke's endorsement of modal intuitions: "If someone thinks that the notion of a necessary or contingent property ... is a philosopher's notion with no intuitive content, he is wrong. Of course, some philosophers think that something's having intuitive content is very inconclusive in favour of it. I think it is very heavy evidence of anything, myself" (1980: 42).

However, against this Kripkean line of thought, which has enjoyed much recognition and acceptance, Hill (1997) raises a serious objection. He summarises his objection thus: "I have maintained that the mechanisms that are responsible for a number of our modal intuitions are unreliable" (1997: 81). How should Hill's (and perhaps many others') distrust of modal intuitions be addressed? I think studies in modal psychology, specifically modal psychology qua study of mechanism, can ease the tension. It seems to be *prima facie* true, that by determining the psychological source of modal intuitions, we can determine to what extent we should trust the intuitions. To the extent to which perception and imagination are the natural psychological processes with which we form modal beliefs, the modal psychology qua study of mechanism that I undertake in this dissertation may be the starting place for constructing an account that would contribute to the removal of this entrenched distrust about modal intuitions. For if we can ascertain that modal intuitions are not some extraordinary, esoteric, and elitist intuitions, that they are rather ordinary, exoteric, and ubiquitous, and also why they are so, and I have claimed that these are achievable with modal psychology qua study of mechanism, then there would be very little to gain in sustaining the entrenched distrust of modal intuitions.

## 1.7 Summary

This chapter sets up the background of this dissertation. It began by explaining the problem of modal justification and stating that it will be the central question of this dissertation. It explained how this dissertation aims to resolve this problem—by being empiricist, naturalistic, modal psychological, externalist, and reliabilist. It identified the implicated psychological processes in modalising—perception and imagination—and explained how they would be used in investigating the two broad kinds of modality—basic and philosophical. It then discussed the preferred argumentative strategy and also some prospects of embarking on the kind of naturalistic project I have in mind. The discussed prospects, however, are contingent upon the success of this dissertation. So, let us get to work, and give attention to what I said this dissertation aims at delivering: a naturalistic account of how our modal beliefs are justified. This will be the focus in the second part of this dissertation.

## **PART II**

# Chapter 2

## Modal Psychology: Justifying Basic Modal Beliefs via Perception

### 2.1 Introduction

This chapter seeks to develop an account of how perception can justify beliefs about basic modality; i.e., the modality that seems to be useful for everyday reasoning and acting. In section (2.2), I argue that perception has inherently modal content. In doing this, I rely in large part on the Gibsonian notion of ‘affordances’. Having done so, I show how this modal content of perception can provide justification for basic modal (BM) beliefs in section (2.3). The general idea is that perceptual systems, like any other cognitive systems, are constrained by some discernible standards of rationality, such that their belief-outputs can be epistemically justified. In section (2.4), I explain how the perceptual justification of BM-beliefs can withstand cognitive penetration, which is one of the commonest forms of defeaters. Section (2.5) summarises the chapter.

Although I will use normal human adults as the case study in most of the arguments in this chapter, I should clarify that what I say also applies to children and non-human perceivers, like some non-human animals, zombies, and aliens, at least, to the extent to which they are capable of forming BM-beliefs (see section 1.5). For the most part, I will rely on Lyons (2009), because his reliabilist approach is, thus far, the most developed account of perceptual justification that incorporates original findings of cognitive science, and cognitive neuroscience. I should disclaim that, unlike him, I won’t give a comprehensive reliabilist account of perceptual modal justification, but I will cover the most relevant grounds. In addition, *prima facie* justification is my main concern, but I will also touch on *ultima facie* justification briefly. *Ultima facie* justification being *prima facie* justification that’s undefeated.

## 2.2 Perceptual Modality

It seems uncontroversial that perception is a basic source of knowledge of contingent facts.<sup>1</sup> Perception justifies our beliefs, especially our perceptual beliefs, in a manner that doesn't require additional support from our pre-existing beliefs (Pryor 2005; Huemer 2007; Lyons 2009). Simply, perception is a source of *prima facie* justification. Our concern in this chapter, is to see whether perception can also *prima facie* justify BM-beliefs, and, if it can, how it does so. But this can't happen if perception lacks modal contents, and if BM-beliefs aren't perceptual beliefs. Thus, I will argue that perception has inherently modal content (section 2.2.1), and that BM-beliefs are perceptual beliefs (section 2.2.2).

Despite talks of perceptual *content*, I will argue using the Gibsonian notion of 'affordances' earlier introduced (see section 1.3). It is true that Gibson is often taken to be an anti-representationalist, and perception is said to lack content under anti-representationalism (e.g. Travis 2004),<sup>2</sup> such that it seems to be too much trouble using affordances in representationalist terms. But what I say can be defended from both anti-representationalist and even from non-Gibsonian perspectives. Perception need not have content for basic modality to feature in it. Enactivism (e.g. Nöe 2004), for example, is both anti-representationalist and non-Gibsonian; yet, it explains perception as involving *possibilities*. In addition, Nanay (2011a, 2012a) gives a non-Gibsonian but representationalist defence of perception as involving possibilities. In the face of these alternatives, it might be asked: Why use affordances in representationalist terms when Gibson is an anti-representationalist when there are alternatives that don't require such weird strategy?

Firstly, I am interested in modal epistemology, and to be clear about this, it is wise to treat perception as having content, such that perceptual content can contain beliefs. Secondly, even though it is possible that one can do this without talk of contents, that would ultimately involve clarifying how beliefs can be explained without content-talk, which is a fight about the enterprise of epistemology that I don't want to get into. I am trying to do something *within* epistemology, not defend the whole enterprise. Moreover, enactivism is inherently phenomenalist, and since my epistemology is externalist, it can't be phenomenalist. Thirdly, even though Nanay's non-Gibsonian representationalist account present another way to go about this, some of the relevant literature that lends him empirical support draws explicitly on the Gibsonian affordances (see fn. 8, below). More importantly, with affordances, I am better able to incorporate original findings

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<sup>1</sup> But see Davidson (1986), and in some ways Quine (1960).

<sup>2</sup> But see Schellenberg (2011).

from cognitive (neuro)science, cognitive psychology, and evolutionary psychology. Since I invest so much in affordances, my arguments might be susceptible to some unresolved problems about affordances. One such problem stems from the metaphysics of affordances, which I will respond to in section (4.2.1).<sup>3</sup> For now, let us see how affordances help us establish the notion that some perception has inherently modal content.

### 2.2.1 Perceptual Modal Content

One reason it might seem highly doubtful that perception has any modal content is that perceptual content seems to be exhausted by low-level sensory data, like colour, shape, weight, and so on (e.g. Tye 1995). This is reminiscent of what I have called the *Humean metapsychological thesis* (section 1.2). The thesis is that “experience teaches us that a thing is so and so, but not that it cannot be otherwise” (Kant, *Critique of Pure Reason*, B Introduction, §II), such that experience plays no necessary role in modal justification. The stumbling block on our path to perceptual modal content and perceptual modal justification, then, is this thesis. As I said in section (1.2), this thesis is widely accepted by most rationalists, and even by some empiricists in contemporary modal epistemology, and that this is why empiricist modal epistemology took a considerable period before gaining some foothold in the modal epistemological landscape. To refute the thesis, however, I will take a closer look at what Hume says, to be able to better give substantive arguments against it. But it must be clear that this isn’t just about Hume; we will encounter some neo-Humeans as we progress.

Hume is famous for being a strict empiricist. “All our ideas are but faint copies of former impressions” (*Treatise* 1.1.1.6, 7), he famously proclaims, and impressions, as many have interpreted him, are nothing over and above sensations. Even though he clearly says he won’t discuss what this ‘copying’ entails,<sup>4</sup> because “the examination of our sensations belongs more to anatomists and natural philosophers than to moral” (*Treatise* 1.1.1.8), it is clear that he takes impressions qua sensations to be passive. Here is one instance: “When both the objects are present to the senses along with the relation, we call this perception rather than reasoning; nor is there in this case any exercise of the thought, or any action, properly speaking, *but a mere passive admission of the impressions through the organs of sensation*” (*Treatise* 1.3.2.73, my italics). Beyond taking the senses as passive, this statement also tells us what Hume takes to be active during perceptual processing: the exercise of thought in the coupling together of ideas. Hence, for Hume, impressions are meant to be regarded as non-representational, and ideas, representational (Frasca-Spada 2002).

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<sup>3</sup> The problem is that under one dispositional construal of affordances, affordances support rather than oppose the Humean metapsychological thesis (Heras-Escribano 2019).

<sup>4</sup> But see Broughton (2006) for an attempt.



But if impressions or sensations are non-representational, then they are only passively transmitted by perceptual systems—transmitted in the manner in which tree branches transmit information. This passivity lies behind Hume’s conclusion that perceptual content is exhausted by low-level sensory data, and that whatever else is not reducible to them, are mere inferences from memory and/or induction about them. By Hume’s standard, therefore, whatever epistemic relevance there is to the formation of perceptual belief, such relevance is taken over by non-perceptual systems, perhaps memory, induction, or some reasoning systems. But this flies in the face of empirical findings, especially as reported by Gibson (1979) in his theory of affordances. The veracity of this evidence is attested to by Timothy Williamson, who is very much interested in modal epistemology:

Humean arguments remain surprisingly influential in the philosophy of modality, despite (or even because of) their seeming reliance on *a priori* crudely empiricist assumptions. In particular, it is often still taken for granted that the contents of perception are non-modal ... A responsible empiricist should at least consider scientific alternatives such as Gibson’s theory of perceptual affordances and its recent successors, on which sense perception has inherently modal contents (2016b: 460).

A closer look at Gibson’s notion of affordances, then, might explain why Williamson and I think we can reject the Humean metapsychological thesis if we listen to Gibson.

Gibson’s approach in psychology is set against the backdrop of behaviourism and cognitivism. Behaviourism holds that psychology involves measuring behavioural responses to environmental stimuli without recourse to inner mental states. Cognitivism holds that psychology involves understanding the inner mental states that are triggered by environmental stimuli. Effectively, both approaches take psychology to be a function of a *stimulus-response formula*; i.e., like Hume, they both take perceptual systems to be passive. But, for Gibson, this stimulus-response formula is inadequate as the basis for a correct psychology of perception. The problem, as he explains it, is that both behaviourism and cognitivism measure sensory stimuli independently of organisms’ capabilities (Lobo et. al. 2018). But, according to him, sensory stimuli are essentially associated with organisms’ capabilities, in that most of what an organism sees is seen from the perspective of what it can and can’t do. (This is why his approach is *ecological*.) Thus, he rejects the stimulus-response formula, and with it, behaviourism and cognitivism. In their stead, he puts forward his now famous ecological approach, and at the centre of the approach is the notion of *affordance*. I have earlier discussed this notion (section 1.3), so, I will be brief here.

An affordance captures the continuous and dynamic relationship between perception and action—perception is an active process, evolutionarily equipped to enable access to information in the environment that could support action and guide behaviour. An affordance “is neither an objective property nor a subjective property; or it is both if you like ... It is equally a fact of the environment and a fact of behaviour” (Gibson 1979: 129). When an organism perceives an affordance, it simultaneously perceives something about itself and something about its environment. Simply, affordances are organism-scaled action-relevant properties of the environment, and they are, if not the direct object of perception,<sup>5</sup> part of what we perceive. If so, and since affordances are high-level and non-sensory, then it follows that perceptual systems are not passive, contrary to what Hume thinks. As a side-note, the idea that perceptual systems are not passive, though still contested, is gaining much adherence as accounts that defend the representation of different high-level non-sensory properties are surfacing. For instance, agenthood (Scholl and Tremoulet 2000), efficacy (Siegel 2005), sortal properties (e.g. Siegel 2006), causality (Siegel 2009), normativity (e.g. Kelly 2010), and action-properties (Nanay 2011a, 2012a). I will now give two independent arguments with empirical bases for why we should accept the non-passivity of perceptual systems.

Firstly, despite the controversy that endured for a considerable period between Gibsonians and Marrians, one aspect of Marr’s (1982) findings supports the non-passivity of perceptual systems. In an attempt to show that there is insufficient information in vision as evident in his 2½D-sketch conception of vision, Marr first had to show, using neuroscientific evidence, that even though visual content is *rich*, it is underdetermined (Rolls 2011). If someone’s back is turned towards you, you won’t be able to see the person’s face; you only complete the image by adding the remaining ½ in your mind to make the image 3D. But what you see—the 2½—has complex information like depth, surface orientation, motion, distance, and so on, which straightforwardly show that information processing of sensory data also occurs at the perceptual level. Depth perception, for instance, requires the perceptual processing of over half a dozen monocular and binocular cues, which can occur in the absence of cognition or occur with the barest form of cognition. If so, then this might explain why some animals, like the digger wasp, which have been argued to lack cognition (e.g., Dennett 1984), are able to fly or land.<sup>6</sup> Simply, their depth perception is rich enough

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<sup>5</sup> Burge (2003: 515, fn. 10), for example, argues that affordances are not the direct object of perception.

<sup>6</sup> But see van Duijn et al, (2006). A peculiar behaviour of the digger wasp sets up the stage for this debate:

When the time comes for egg laying, the wasp builds a burrow for the purpose and seeks out a cricket which she stings in such a way as to paralyze but not kill it ... leave it on the threshold, go inside to see that all is well, emerge, and then drag the cricket in. If the cricket is moved a few inches away while the wasp is inside making her preliminary

to allow it, and they seem not to need cognition to process it.<sup>7</sup> In which case, perceptual systems aren't passive.

Another piece of empirical evidence for the non-passivity of perceptual systems is results from unilateral neglect. Unilateral neglect is caused by brain lesions, primarily in the right parietal area, which makes the patient unaware of sensory stimuli in the side contralateral to the damage. For example, a man suffering from unilateral neglect may shave only the right side of his face, leaving the left side unshaved if the left side is the contralateral side (Driver and Vuilleumier 2001). But it has been recorded that the man can find objects placed in the contralateral side if the objects are defined by what they can be used for (Humphreys and Riddoch 2001, 2007; Riddoch et al. 1998). This seems to show that the perceptual content of unilateral neglect patient isn't exhausted by low-level sensory data; at least, the properties of what an object can be used for (action-properties) are also part of their perceptual contents (Nanay 2011a, 2012b).<sup>8</sup> After all, how could action-properties be inferred from low-level sensory properties, which the subject isn't aware of? But, if there is no inference, then there is probably perceptual processing going on at the perceptual level for the subject. Nanay (2012b) further argues that if this is true for a unilateral neglect patient, then it is true for us; i.e., action-properties are part of our perceptual phenomenology.<sup>9</sup>

But there is the question of *report*. Perhaps the unilateral neglect patient is aware of sensory stimuli in his contralateral side but just unable to report them, such that there could still be unconscious

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inspection, the wasp, on emerging from the burrow, will bring the cricket back to the threshold, but not inside, and will then repeat the preparatory procedure of entering the burrow to see that everything is all right. If again the cricket is removed a few inches while the wasp is inside, once again she will move the cricket up to the threshold and re-enter the burrow for a final check. The wasp never thinks of pulling the cricket straight in. On one occasion this procedure was repeated forty times, with the same result (Wooldridge 1963: 82).

Dennett argues that given this peculiar behaviour, the digger wasp “is not a free agent, but rather at the mercy of brute physical causation, driven inexorably into her states and activities by features of the environment outside her control ... One is even inclined to wonder if she has any inkling of her own existence!” (1984: 11, 23). *Pace* Dennett's no-cognition conclusion, van Dujin et al. argue that since this behavioural loop is difficult to replicate in robots, it is rather evidence for minimal cognition not no-cognition. The debate is still ongoing.

<sup>7</sup> And until it is decided that these animals have minimal cognition, my argument stands. That is, the possibility that depth perception could be part of these animals' minimal *cognition* has dispositive force only when the debate about minimal cognition and no-cognition (fn. 6, above) has been concluded.

<sup>8</sup> Earlier, I said that some of the relevant literature that lends Nanay empirical support explicitly reference affordance. Riddoch et al. (1998) is one of such, and Nanay cites it in all the works where he defends the perceptual representation of action-properties.

<sup>9</sup> His reason is the following principle: “to know that a property P is part of our perceptual phenomenology, it is enough to find patients with brain lesions that are capable of experiencing P” (Nanay 2012b: 242). I will later call this the *lesion* principle, and I will refer to it frequently as we progress in this chapter.

inferences going on. In which case, perceptual systems may still be passive. I think this question about report can be convincingly answered, if we reframe the argument from unilateral neglect. The phenomenological sense in which the argument is framed seems to give weight to the report-question. If framed in a non-phenomenological sense, I think the report-challenge would be blocked. For instance, one reason unilateral neglect patients are able to detect action-properties might be that “representations may be made available to action systems even when patients fail to consciously *report* stimuli” (Humphreys 2000: 4, my italics). The relevant question then is whether representations are fed into the action systems perceptually or not? Intriguingly, there is overwhelming evidence that representations are perceptually fed into the action systems.

One very important piece of evidence is the lesson learnt from the so-called ‘mirror neurons’, discovered in the premotor cortex of the macaque brain (Rizzolatti et al. 1998; di Pellegrino et al. 1992; Gallese et al. 1996; Rizzolatti and Craighero 2004). These neurons supposedly fire even when an agent observes an action it can perform being performed by another agent. Even though the existence of the neurons themselves in humans is questionable, the lesson that the same neural mechanisms, which are responsible for action-performance are also engaged to some extent when we see actions we can perform being performed by others, seems to have become uncontroversial (see, e.g., Iacoboni 2008). The point here is that just by *perceiving* another agent performing an action we can perform; our action systems are activated. In short, action is encoded in terms of *perceptual* events (Hommel et al. 2000), and this seems to show that representations are perceptually fed into the action systems. (I will dwell on this in section (2.2.2), below.) If representations are perceptually fed into action systems, then unilateral neglect patients aren’t inferring action-properties from sensory properties, whether or not they are aware of sensory data but unable to report them, for perception is sufficient for the representation of action-properties.

*Pace* Hume, therefore, these two pieces of evidence are sufficient to show the non-passivity of perceptual systems. Perceptual content isn’t exhausted by low-level sensory properties; high-level non-sensory properties are also represented in perceptual content. I should disclaim that the debate concerning the sensory and non-sensory contents of perception is still on-going (see, e.g., Hawley and Macpherson 2011), and my argument here isn’t definitive on the matter. But, for our purpose, which is to establish the modal content of perception, my arguments are sufficient. Perceptual content contains both low-level sensory and high-level non-sensory properties. But, if it is true that perceptual content is constituted by both low-level sensory and high-level non-sensory properties, then BM-properties (affordances, action-properties, and dispositional properties) may be represented in perceptual contents. I will use affordances here again to make my point.

The way Gibson sets things up, the range of relations that can be counted as instances of affordances is eclectic. For instance, water affords drinking, the air affords breathing, the ground affords standing, and surfaces afford falling off, and so on (Spurrett 2018). It seems clear from this ecumenical list that affordances are of *possibilities*.<sup>10</sup> This then means that if perception *affords* and affordances are of possibilities, then, by transitivity, possibilities are straightforwardly part of perceptual content. This, I take it, is what Williamson means in the statement quoted above. In addition, since action-properties and dispositional properties are, alongside affordances, examples of BM-properties, and since they have been independently defended to be part of perceptual contents, they lend credibility to the claim that BM-properties are perceptually represented. Put simply, the Humean metapsychological thesis, as Williamson suspects, is wrong. Perception doesn't only tell us what is the case; it also tells us what could or must be the case.

However, even if perceptual systems aren't passive and BM-properties are part of perceptual contents, it doesn't thereby follow that perceptual systems play any epistemic role in the justification of BM-beliefs. And this is what I need for my reliabilist account of perceptual modal justification. Perceptual systems must be carrying a significant portion of the epistemic load in any reliabilist epistemology. To know whether they do in the reliabilist account I want to defend here, it must be clear that they output BM-beliefs—we can't talk in terms of justification if there are no beliefs. After all, reliabilism entails that the relevant process plays some causal and justificatory roles in the formation of belief. Hence, talk about the reliability of the process, and talk about the justificatory power such process has in virtue of being reliable. In the next section, I will argue that BM-beliefs are the outputs of perceptual systems, such that they are perceptual beliefs.

### 2.2.2 Perceptual Modal Beliefs

Standardly, a belief is a perceptual belief if it is formed on the basis of perceptual experiences. As Lyons puts it: “my belief that *p* is a perceptual belief if and only if I believe that *p* because things look (sound, smell, etc.) as if *p*” (2009: 87). So, if I believe that it is cold because someone I trust tells me it is cold, my belief isn't perceptual. Rather, it is a testimonial belief. But if I believe it is cold because I feel cold, then the belief is perceptual. This way, perceptual experiences seem indispensable to the formation of perceptual beliefs. However, since BM-properties, and, by extension, other perceptible high-level non-sensory properties, like sortal properties, causality, agenthood, efficacy, and normativity, aren't accompanied by any perceptual experiences, beliefs

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<sup>10</sup> They are often possibilities for action, but not always (Spurrett 2018). Some affordances are what Siegel (2014) calls ‘proto-affordances’ in that they are possibilities unrelated to agency, either because they are possibilities for objects that lack agency, or they are possibilities to which a subject's agency is irrelevant. I will skirt this detail here.

about them won't qualify as perceptual beliefs. Effectively, this would block the viability of any reliabilist modal epistemology like mine. But, if we can couch the formation of perceptual beliefs in a way that the indispensability of perceptual experiences to it is downplayed, then reliabilism in modal epistemology would remain on track.<sup>11</sup> Lyons (2009) offers just that.

According to Lyons, a belief is a perceptual belief if it is the output of a 'perceptual system', now using 'perceptual system' in the cognitive scientific sense of the term. I have spent time in section (1.5) on what a cognitive system/module is. To remind ourselves: modules are information-processing mechanisms that are innately specified, domain specific, informationally encapsulated, and introspectively opaque. And systems are often taken as ensembles of modules. The relevant issue now is specifying 'perceptual system' as a cognitive system. According to Lyons, a perceptual system "is a cognitive system that starts with the stimulation of sense organs by physical energy as input and processes information about the current environment, where none of the inputs to any of the subsystems are under the direct voluntary control of the larger organism" (2009: 94).<sup>12</sup> Since cognitive systems are often assembled from simpler subsystems, and perceptual systems are, undoubtedly, assemblages of very many subsystems (e.g., Goodale and Milner 1992; Marsolek 1999), accurate depictions of them in boxes are often very complex. (Talk of 'boxes' doesn't imply that the representation tokens located in a box share a spatial location in the mind, but that they share an important cluster of causal properties, which aren't shared by other representation types.) Nonetheless, fig. 2.1 is Lyons' simplified version that depicts some components of a perceptual system,<sup>13</sup> which will serve as a basic architecture of perceptual systems for our purpose.

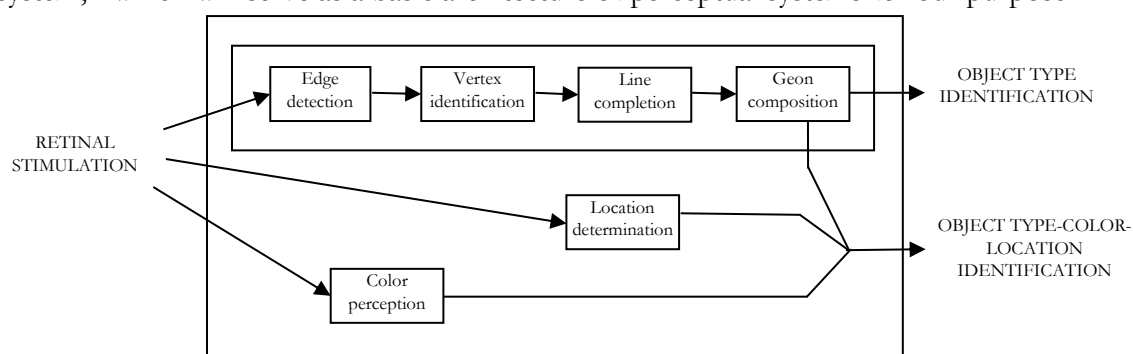


Fig. 2.1 A basic architecture of perception

<sup>11</sup> There is another reason why we should do this. It is that phenomenalism in perceptual justification talk isn't supported by any current scientific theory of consciousness. See Berger et al. (2018).

<sup>12</sup> For Lyons, however, perceptual systems are not *introspectively* opaque in the Fodorian sense, but *inferentially* opaque in Bonjour's (1985) sense: "they are not the result of an introspectable train of reasoning from earlier beliefs" (Lyons 2009: 95). I will return to this in section (2.3.1).

<sup>13</sup> See Nichols and Stich (2003) for an alternative account. Their account is unusable for our purpose because by it perceptual systems have non-conceptual outputs.

In section (1.5), I explained that perceptual systems, according to Lyons, are conceptual; i.e., their outputs, contrary to the Fodorian restrictive notion of modules, are sometimes thoughts and beliefs. What Lyons emphasises is that even though perceptual systems are innately specified,<sup>14</sup> their outputs are malleable, in that they are “patently affected by learning” (2009: 92). The face recognition system, for example, can’t identify someone as my mother unless it has learnt over time that she is my mother. But if I develop prosopagnosia and can’t recognise her as my mother anymore, then it is plausible that the high-level non-sensory representations that came with the perceptual learning, which enabled my face recognition to learn, for instance, that ‘someone is my mother’, are part of the outputs of my perceptual systems. Tucker (2010) makes a similar point. Again, the reason here seems to be the *lesion-principle*, which Nanay (2012b) uses in establishing the idea that action-properties are part of our perceptual phenomenology. The principle is that “to know that a property P is part of our perceptual phenomenology, it is enough to find patients with brain lesions that are capable of experiencing P” (see fn. 9, above). Thus, Lyons writes: “A perceptual system is, in the first instance, a module that starts with the transduction of energy by some sense organ and produces beliefs or other relatively high-level representations as outputs” (2009: 92). This way, perceptual beliefs become the *doxastic* outputs of perceptual systems.

Under this construal, perceptual beliefs need not be accompanied by any corresponding perceptual experiences, because perceptual systems are carrying all the epistemic load. You can completely lack corresponding perceptual experiences and the formed belief would still be perceptual. This way, beliefs about BM-properties and other afore listed perceptible high-level non-sensory properties will count as perceptual beliefs. Nonetheless, it is one thing for BM-beliefs to be perceptual beliefs, and another for us to actually form those beliefs. Nothing in the story told so far suggests that perceptual systems, though in theory capable of outputting beliefs without corresponding perceptual experiences, do in fact output *BM*-beliefs. One way to put this scepticism to bed is to account for BM-beliefs in terms of the basic architecture of perception given above. Gibson’s notion of affordance again proves very useful. I will also continue to use the architecture of *visual* systems, primarily because much of Gibson’s examples of affordances are visual cases, and also because vision is the most researched of the sense modalities. However, this doesn’t mean that BM-beliefs are the outputs of visual systems only. If my account of how BM-beliefs are the outputs of visual systems is plausible, then there is no apparent implausibility in extending the arguments from the visual case to non-visual cases.

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<sup>14</sup> Innateness is at the root of a huge controversy in both philosophy and cognitive science. But refer to section (1.5) for a Fodorian definition.

In section (2.2.1), we saw how perception is sufficient for action, in that there need not be any other kinds of inputs beside perceptual ones for action systems to be activated. What this means is that beliefs and desires may be just add-ons in action processing (Nanay 2010). Since basic modalities are those that are useful for everyday reasoning and acting (section 1.4), dwelling on the continuity between perception and action is an appropriate place to begin our analysis of how BM-beliefs are the outputs of perceptual systems. Without getting into the technicalities involved, action processes are traceable to two visual subsystems, which we share with most non-human animals: the ventral and dorsal streams (Milner and Goodale 1995). The ventral stream, located in the temporal lobe, is responsible for identification and recognition, while the dorsal stream, located in the parietal lobe, is responsible for visual control of motor actions. It has been argued that the best way to think about both streams is as ensembles of multiple sub-streams (e.g., Rizzolatti and Matelli 2003; Carruthers 2006; Kravitz 2011). In normal circumstances, the two streams work together, but they can also work independently; for example, in cases of optic ataxia where the dorsal stream is malfunctioning, and visual agnosia where the ventral stream is malfunctioning. Our focus here is on how action is possible in cases of visual agnosia, since in those cases, action is being performed and completed in the absence of cognition.

Even though there are competing hypotheses for how a visual agnostic can correctly manipulate objects (e.g. McCarthy and Warrington 1988; Lauro-Grotto et. al. 1997), one plausible hypothesis is the existence of a parietal lobe-based (sub)system of non-semantic sensorimotor representations that may be triggered by only objects' *affordances* (Sirigu et. al. 1991; Humphreys 2000). But the challenge with this hypothesis is that it is ambivalent about whether the agnostic's ability to correctly manipulate objects is due to familiarity with the objects or similar objects. To remove this challenge, Hodges et al. (1999) carried out an experimental test on three patients (DJE, IF, FL) with different disorders. DJE and IF had semantic dementia; i.e., a form of progressive degradation of semantic memory, but IF's semantic dementia was much more severe than DJE's. FL had corticobasal degeneration; i.e., a form of apraxia where her motor control is damaged. The three subjects were asked to perform actions with novel tasks, as depicted in fig. 2.2. Hodges et al.'s findings from this test clarify that familiarity with objects or similar objects doesn't play a necessary role in the correct manipulation of objects, as the subjects with visual agnosia (DJE and IF) performed better than FL in the usage of novel tools. In fact, IF, whose agnosia was much more severe, performed better than DJE.<sup>15</sup>

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<sup>15</sup> There is a challenge here. It is that, perhaps the procedural memory of DJE and IF is intact, even though their semantic memory is damaged, and so, this might explain why they can correctly manipulate the novel objects better



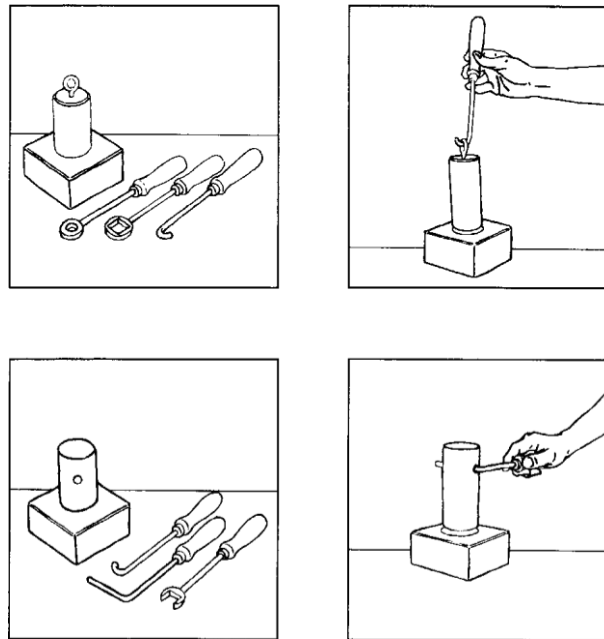


Fig. 2.2 Novel tool tasks performed by DJE, IF, and FL

The conclusion of Hodges et al. is that “when semantically impaired patients are observed to use objects (for which they have degraded knowledge) ‘appropriately,’ this is attributable to a parietal lobe system specialized for visuomotor interaction with the environment, which may be triggered by the visual, and perhaps tactile, *affordances* of objects” (1999: 9447, my italics). In a sense, the subjects are discriminating about possibilities, selecting or rejecting tools that would or wouldn’t work based on the tools’ chance to work for the relevant task. And this means that their behaviour shows they are selectively and successfully responding to the possibilities around them. Furthermore, Hodges et al. say that this system, which is activated by affordances, “does not rely on object-specific knowledge but, rather, enables mechanical problem solving and, hence, the efficient use of objects (*whether familiar or not*) in a manner consistent with their physical properties” (1999: 9447, my italics).<sup>16</sup> If so, and given the lesion-principle, then familiarity with an object or similar objects isn’t necessary to perceive the object’s affordances.

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than FL. After all, FL’s apraxia will most likely implicate his procedural memory, which would then explain why he couldn’t correctly manipulate the novel objects as well as DJE and IF. I don’t think this challenge works. This is because approaches to relearn procedures seem to exploit the relative preservation of episodic and semantic memory function, and this highlights an interconnectedness between procedural and semantic memory (e.g., Matthews 2015). Since the semantic memory of DJE and IF is damaged, it is highly unlikely that their procedural memory is intact. Foerde and Shohamy put it better: “Patients [suffering] from motor impairments, also have cognitive and mnemonic impairments, even in the earliest stages of the disease when damage is relatively selective to the striatum” (2011: 625).

<sup>16</sup> Riddoch et al. (1998), and Humphreys and Riddoch (2001, 2007) reached similar conclusion, but they argued from a non-affordance perspective.

This seems plausible, for as Jacobs (2012) makes clear, a dog would detect something completely unfamiliar as edible or inedible the very first time it perceives it. Well, there is the case of repugnance and appeal, which might explain why dogs can do this. For instance, dogs may eat large quantities of chocolate even though it might kill them just because it smells appealingly to them. And they might also perceive any chocolate-smelling substances as edible. But then, nothing in what I have said entails that affordance-perception is always accurate. Perception is fallible; so too is affordance-perception. I will say more about this shortly (sections 2.3.1 and 2.4.1). At any rate, this caution is welcomed; my task is to show that familiarity is not always needed, not that it is never needed.

What this helps us achieve, in essence, is dispelling any neo-Humean thought that affordances are not perceived but inferred. For despite my arguments in section (2.2.1) to the effect that perception has inherently modal contents, a neo-Humean might insist that whatever modal content perception has, is inferred not perceived. (Although I have tried to argue against this when I tackled the question of report, from which talk of unconscious inference might generate. Humeans are difficult to satiate!) To put it forcefully, therefore, affordances are taken as inputs by, at least, one of our visual subsystems. This visual subsystem directly feeds input into action systems, such that affordances are no more inferred from sensory stimuli than colour, shape, size, location, motion, and weight are inferred from sense data. Affordances trigger a sub-stream of the dorsal stream, which only requires perceptual events or interactive visuomotor stimuli and nothing else as inputs. As Hodges et al. (1999) hypothesise, apraxic disorders like the one suffered by FL, may be attributed to damage of this dorsal sub-stream. The visuomotor interaction sub-stream (hereafter, simply as VIS) is part of the architecture of humans' perception, and, most probably, of many non-human <sup>52</sup>perceivers' perception. Fig. 2.3 gives a rough depiction.

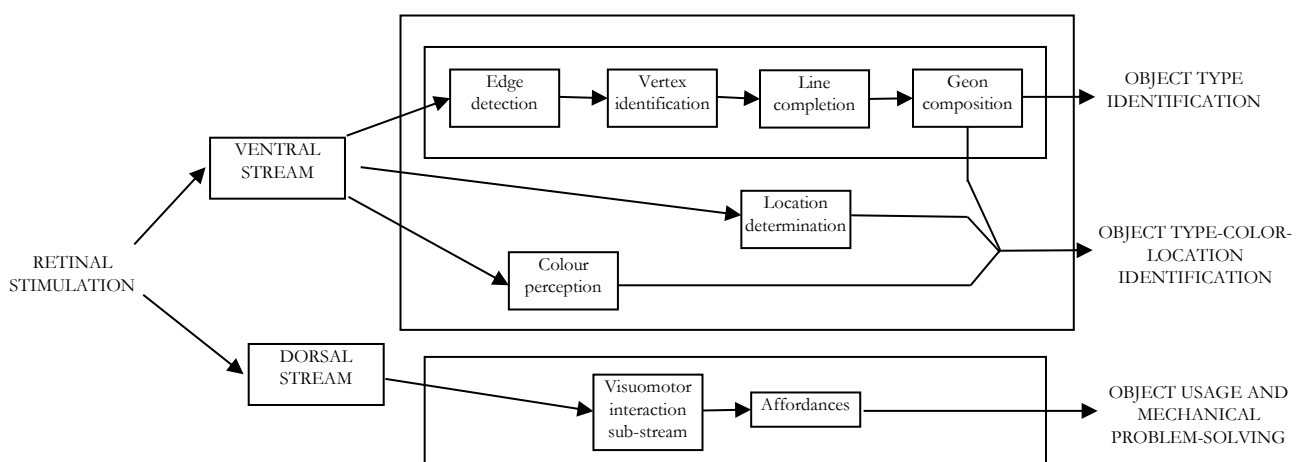


Fig. 2.3 An architecture of perceptual systems with affordances

But how does the VIS work, it might be asked? Does it transduce energy of any sort, and if it does, how does it do so? I take the first question—whether the VIS transduces energy—to be relatively straightforward. The VIS, like any other module, would receive and send neural energy. The second question—how the VIS transduces energy—is not so straightforward. How does the VIS receive signals? Are affordances like colour and shape that stimulate the senses? No. Affordances do not stimulate the senses. This was McGinn’s point when he states that “You do not see what would obtain in certain counterfactual situations; you see only what actually obtains ... Your eyes do not respond to *woulds* and *might have been’s*” (1996: 540). But if the VIS doesn’t work by sensory stimulation, how then does it work? Nanay (2011b) and Vetter (2018) give an answer: Sensory stimulation doesn’t exhaust perception. Vetter’s example is clearer: “There is eye stimulation without perception, as in the case of looking at a homogenous fog. More importantly, there can be perception without a corresponding stimulation of the eye. We perceive objects as moving, for instance, but arguably our eyes do not respond to that movement itself” (2018: 21).

Thus, if perception isn’t exhausted by sensory stimulation, then affordance-perception need not rely on sensory stimulation. Perceptual information is rich enough to accommodate non-sensory properties (section 2.2.1). The VIS need only be able to take affordances as inputs, and unless there is a limitation on what kind of input a module can take, there is no conflict here. After all, the face recognition module, which is uncontroversially perceptual, takes the information that ‘someone I am looking at is my mother’ as input, and that information is surely not sensory. That a module is *perceptual* does not mean it takes only sensory inputs. If so, then just as the face recognition (and arguably some other perceptual) module doesn’t require its inputs to be sensory to pick them up, so too do affordances not need to be sensory for them to be picked up by the VIS. In short, sensory stimulation is sufficient but not necessary for perception.

Having clarified how the VIS works, let us continue on our way. The task before us in this section, we would recall, is to show how BM-beliefs are perceptual beliefs; i.e., the doxastic outputs of a perceptual system. Thus far, we have seen that BM-properties are the direct and explicit inputs of a perceptual module. What is left, then, is to show that this module features in a larger system that generates our beliefs about BM-properties. I think the VIS is a necessary component of such a larger system. The VIS, I have argued, is part of the architecture of humans’ perception, and most probably, of many non-humans’ as well. But that is not the end of the story. For humans and those non-human perceivers who can have propositional attitudes (see Burge (2003) for some non-human animals, Bergmann (2013) for aliens, and Lyons (2009) for zombies), sometimes, the outputs of a larger system that has the VIS as a constituent part are *beliefs*. These beliefs, I contend, are BM-beliefs. Let me elaborate.

Take IF again. The tool task she performed flawlessly in was to use novel tools in performing any task, despite lacking semantic memory of any tool similar to the novel tools (see fig. 2.2). Since the dorsal stream alone can't output *beliefs*, we know that any belief she would have about the affordances of those alien tools would require the cooperation of the ventral stream, and probably, of some other belief-generating systems. Thus, a normal human perceiver with a well-functioning ventral stream, would have beliefs like 'the hook-like object can lift the cylinder'. But IF's belief structure would be different. Since her ventral stream is malfunctioning, she would lack the relevant concepts. In which case, her belief might have the following form: 'tool *A* can do *X*'.<sup>17</sup> While this belief is structurally different from that of a normal human perceiver, both beliefs qualify, in all relevant senses, as BM-beliefs. And in both instances, they are the outputs of an ensemble of the VIS and some other belief-generating systems. Let us call any such larger system, a *BM-system*. Since BM-systems are clearly *perceptual* systems, it follows that BM-beliefs are the outputs of a perceptual system, and by Lyons' definition, that makes them perceptual beliefs.

Conclusively, BM-beliefs are often the outputs of perceptual systems, and most importantly, familiarity is *necessary* for this to occur. I should clarify that I haven't said familiarity never features in BM-perception and BM-belief formation; I have only argued that it is not necessary that it does so. What necessarily features is affordances, and an affordance-triggered module. Familiarity is an add-on effect of our cognitive interaction with our environment. In any case, it suffices that humans and most non-human perceivers have BM-systems that output BM-beliefs, and this makes BM-beliefs perceptual beliefs. Since we need beliefs to talk in terms of justification, the stage is now set for the account of perceptual modal justification that is the target in this chapter.

## 2.3 Perceptual Modal Justification: Basic BM-beliefs

I have declared (section 1.4) that my account of perceptual modal justification will be reliabilist, and I have tried to set up the stage for it by defending the perceptuality of BM-beliefs (sections 2.2.1 and 2.2.2). Since we now know that perceptual systems output BM-beliefs, and since the reliability of a belief-forming system is sufficient for justification (Goldman 1979), one way to arrive at an account of perceptual modal justification, then, is to see whether the perceptual systems that output BM-beliefs are reliable.

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<sup>17</sup> This might be the form non-human animals', and possibly children's belief would take, since they lack concepts like *hook* and *cylinder*.

### 2.3.1 The Sufficiency of Reliability

Reliabilism, the epistemological approach that emphasizes the truth- or justification-conduciveness of a belief-forming process, is widely accepted within epistemological circles as a viable theory of justification. Precisely, it is widely accepted that the reliability of a belief-forming system is sufficient for the *prima facie* justification of *some* of beliefs formed through that system.<sup>18</sup> And this has been defended by different accounts (e.g., Goldman 1979; Plantinga 1993; Lyons 2009). What differs among these accounts, is how to determine the relevant beliefs for whose *prima facie* justification reliability is sufficient. For instance, Goldman says the system must be belief-independent; Plantinga says the believer must have accepted the belief in question without inferential support from other beliefs; Lyons says the belief must be basic. I will follow Lyons' formulation, partly because it is more comprehensive than the others, and partly because I have followed his account in defending the perceptuality of BM-beliefs.

According to Lyons, a "belief *B* is basic for *S* at *t* iff *B* is the output of one of *S*'s cognitive systems that (i) is inferentially opaque, (ii) has resulted from learning and innate constraints, and (iii) does not base *B* on any doxastic inputs at *t*" (2009: 144). Lyons goes on to show that perceptual systems are one such system, such that perceptual beliefs are basic. In which case, the reliability of perceptual systems becomes sufficient for the *prima facie* justification of perceptual beliefs. Since I have argued that BM-beliefs are perceptual beliefs (section 2.2.2), we can formulate a simple reliabilist perceptual modal justification thesis:

(PMJ<sup>\*\*\*</sup>)<sup>19</sup>: a BM-belief is *prima facie* justified if it is basic.

But the truth of PMJ<sup>\*\*\*</sup> doesn't follow from the fact that perceptual systems output basic beliefs. Precisely because perceptual systems don't always output basic beliefs; sometimes; they also sometimes output non-basic beliefs (Lyons 2019). To defend PMJ<sup>\*\*\*</sup>, therefore, I must show how BM-systems, at least sometimes, meet the above three constraints for basicity. I must show that BM-systems are (i) inferentially opaque, (ii) result from the interplay of learning and innate constraints, and (iii) do not base their belief-outputs on any doxastic inputs into other cognitive systems at the time of outputting them. I will begin from (ii), continue through (i), then end with (iii).

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<sup>18</sup> I needn't mount a full-scale defence of reliabilism, not least because reliabilism has already been extensively defended (e.g., Goldman 1986). Reliabilism, though useful for my task, doesn't stand or fall with it. In fact, as I have mentioned (section 1.6, fn. 25), some aspects of my arguments are amenable to foundationalism.

<sup>19</sup> As I refine this formulation, I will progressively reduce the stars until I get to the target formulation of PMJ that has none.

### ***Innateness and Learned Constraint***

BM-systems seem to predate humans. If Carruthers (2006) is correct that the basic architecture of the human mind is shared with most animals with a central nervous system, then perception, in virtue of being a component of that architecture, predates humans. Thus, any part of the basic architecture of perception, like that depicted in fig. 2.1, applies to most animals with some sort of central nervous system. After all, it is standard to say most animals, even invertebrates, can detect location, colour, and shape (e.g. Menzel 1979; Gallistel 1990). If BM-systems are perceptual *subsystems*, then it follows that BM-systems were already present in the most basic form of mind. That is, BM-systems predate humans.

This isn't new. Gibson's analysis of affordances already suggests as much. Under one interpretation of affordances, invertebrates perceive only affordances. But this Gibsonian view seems to have been empirically falsified. As Burge (2003) makes clear, invertebrates also perceive objective sensory low-level properties like colour, shape, and motion. In whichever camp we pitch our tent, BM-systems come out as being present in the earliest form of mind. If we suppose that the Gibsonian interpretation is correct such that invertebrates perceive *only* affordances, and since BM-systems are responsible for affordance-perception (section 2.2.2), then BM-systems must have been present in the earliest form of mind. Similarly, if we suppose that the non-Gibsonians are correct that invertebrates only *sometimes* perceive affordances, then BM-systems must have been present in the earliest form of mind also. For, invertebrates lack any inference mechanisms, in which case, they must have had a *perceptual* system with which they perceive affordances. They do, it's the BM-system.

Thus, in one sense of 'innateness', BM-systems are innate, since they are genetically structured and have their own basic functional architecture (see fig. 2.3). But the innateness of BM-systems won't do, especially since Graham (2011) has shown that Lyons' innateness constraint isn't enough. According to Graham, it isn't exactly clear why innateness should matter at all to a reliabilist account of perceptual justification. For him, it is possible for there to be perceptual systems, which transduce energy, yield prima facie justification, but fail to be reliable. For example, the perceptual systems of brains-in-vats would be unreliable since they are massively deceived about their surroundings, even though they are prima facie justifying. Consequently, Graham argues that since brains-in-vats meet the innateness constraint but are unreliable, Lyons' account doesn't accommodate it. Graham thinks an account of *why* innateness matters would clarify this limitation. Consequently, Graham argues that a given system must not just be innate, it must also be performing its etiological function; i.e., performing the function it was evolutionarily selected to perform. Call this the *etiological function* sub-constraint. Do BM-systems meet it?

I think they do. The etiological function of BM-systems, given the story I have told thus far, is to make actions possible, and, clearly, that is what BM-systems are doing. I have argued that human adults and children, some non-human animals, zombies, and aliens (to the extent to which what counts as a perceptual system for them is one in the sense in which we use the term ‘perceptual system’) have BM-systems that are responsible for many of the actions that they perform. Thus, we might in fact say that BM-systems are the conduits that enable perception to be continuous with action, and that this is why they were evolutionarily selected. After all, the ability to act is highly advantageous for an agent from an evolutionary perspective. More importantly, BM-systems, unlike brains-in-vats that are functioning normally but outside their normal environment, are performing their etiological function in their normal environment. What is a BM-system’s natural environment? Inside a body in an environment. This much is clear from what Gibson says. Recall why his approach to visual psychology is ecological (section 2.2.1)—perception is essentially associated with organisms’ capabilities, in that most of what an organism perceives is perceived from the perspective of what it can and can’t do. Thus, BM-systems meet the etiological function sub-constraint.

But being an innate system (that’s performing its etiological function) is only part of the story: BM-systems must also be appropriately learned; i.e., “develop through the interaction of genetic and environmental factors” (Lyons 2009: 95). That is, perceivers must train up, in an ordinary way, their usage and reliance on BM-systems. This is Lyon’s learned constraint. The learned constraint is important because it sustains the integrality of perceptual learning to perceptual beliefs (section 2.2.2), and BM-beliefs are certainly influenced by perceptual learning. A rock-surface might be unclimbable for you before taking some lessons in rock-climbing, and climbable afterwards. Do BM-systems meet the learned constraint then? I think they do. BM-systems do not suddenly become active when the perceiver is already an adult. To the extent to which any perceiver *S* (human or non-human) perceives affordances, *S* begins to do so very early in life. For instance, von Hofsten (1979) notes that, as early as the second month after birth, human children have begun to perceive the affordances of objects, like their reachability and grasp-ability. Thus, humans’, and *a fortiori* non-humans’, reliance on BM-systems is not just phylogenetic (by being innate), it is also ontogenetic (because it is also learned). Reliance on BM-systems are learned generally (in the above ontogenetic sense), and also particularly (in a case-by-case sense, for example, the above rock climbing situation). I will say more about this in section (2.3.2).

For now, it suffices that BM-systems aren’t just innate systems that are performing their etiological functions; reliance on them has also been trained up in ordinary ways. In which case, they, result from the interplay of learning and innate constraints.

### ***Inferential Opacity Constraint***

To output basic beliefs, BM-systems must also be inferentially opaque. But what is inferential opacity? Fodor (1983) argues that encapsulation requires *introspective* opacity, by which he means that the interlevel representations of modules mustn't be consciously accessible to the agent. However, since perceptual systems are often ensembles of smaller subsystems, and since these subsystems definitely interact, Lyons (2009) argues that encapsulation should allow *inferential* opacity, even if it blocks introspective opacity. Inferential opacity, then, becomes the idea that a system can still be encapsulated insofar as the introspectively accessible interlevel representations aren't doxastic. If they aren't doxastic, then even if perceptual subsystems interact, the agent won't have any belief about this interaction, or about the interlevel representations that result from such interaction. (This means that the doxastic outputs of a system are cognitively spontaneous in that they are not the result of an introspectible train of reasoning from earlier beliefs.)

This way, the interlevel perceptual representations that we're consciously aware of are non-doxastic (Lyons 2009: 95). What this achieves is ensuring that the outputs of a perceptual system aren't based on any other background belief, such that the resultant perceptual beliefs remain basic. (I will say more about the basing relation in play here in section (2.4.1).) But is this true for BM-systems? Yes. Consider the three-dimensional Ebbinghaus illusion: a poker-chip surrounded by smaller poker-chips appears to be larger than when the same poker-chip is surrounded by larger ones. Here, there seem to be clear interlevel interactions between the dorsal and ventral streams. Or, better still, between different dorsal sub-streams, since a visual agnosic, whose ventral stream is damaged, will still perceive this illusion—object-identification isn't necessary to see visual illusions (see, e.g. Carey 2001). Now, suppose we stipulate that the interlevel representations, which guide grip-size in this illusion are beliefs. If they were introspectively accessible, then the illusion would influence our grip-size. But they don't: grip-size stays the same for both poker-chips (Milner and Goodale 1995).

Some (e.g., Nanay 2010b) take this to mean that beliefs aren't always needed for the performance of action. I myself have leaned towards this position when I argued that perception is sufficient for action (section 2.2.1). But there are other lessons one can take from this fact about the Ebbinghaus illusion. One such lesson is that the interlevel representations output by the interaction between different dorsal sub-streams in cases of visual agnosia, which guide grip-size, aren't doxastic at all. And, even if they are doxastic, they aren't introspectively accessible. Or else, they would influence grip-size, which as we have seen, they don't. Since BM-systems are basically the only system at work in cases of successful action completion in visual agnosia (section 2.2.2), BM-



systems meet the inferential opacity constraint. If so, then by the lesion principle, this fact about the BM-system is true for every human, and *a fortiori* non-human, perceiver.

### ***Doxastic Isolation Constraint***

The doxastic isolation constraint requires, that for a cognitive system to output basic belief *B* at *t*, it mustn't base *B* on input-beliefs into other cognitive systems at *t*. This guarantees that *B* won't require doxastic supports to cohere with the believer's web of knowledge at *t*. For instance, a perceptual belief that 'this is a table' is basic, and, so, doesn't require any doxastic supports to mesh with my web of knowledge. In fact, if for some reasons, the belief conflicts with my web of knowledge, my default position is to challenge my existing beliefs, not this new perceptual belief (Siegel and Silins 2015). That's the force of basicity. But, of course, this can be overridden. When we acquire the concept of 'mirage', for instance, we challenge the perceptual belief that we are seeing a pool of water on a sunny day. Basicity has a default force that can be preserved only if the outputting system is doxastically isolated from other cognitive systems. The relevant question then is this: Are BM-systems doxastically isolated in this way? To properly answer this question, let me say something about how to approach the doxastic isolation constraint.

One can be liberal or strict about this constraint. On the one hand, one can say that a cognitive system might occasionally fail to be doxastically isolated from other cognitive systems and still output basic beliefs. This seems to be Goldman's (1979) position. On the other hand, one can say that no cognitive system outputs basic beliefs if it ever fails to be doxastically isolated from other cognitive systems. This is Lyons' (2009) position. In Lyons' view, what the liberals leave themselves without is an appropriate *basing* relation. I will return to his specification in section (2.4.1); for now, it suffices that one can be strict or liberal about the doxastic isolation constraint. I think the best tack for an account of perceptual modal justification is to be liberal about the constraint. I take it that insofar as basing/inference is at the core of the doxastic isolation constraint, it would be hubristic on the part of any such account if it rules out the possibility that BM-systems sometimes fail to be doxastically isolated from other cognitive systems. After all, that seems to be one reason the neo-Humeans are insisting that memory systems play an integral role in the formation of BM-belief. This much I have conceded. My stance, thus far, has been couched to accommodate this possibility. I have argued only that memory systems aren't *necessary* in BM-belief formation (section 2.2.2), not that they no play whatsoever. Thus, I will be liberal about the doxastic isolation constraint.

What I need to do then, is generalise my earlier argument about the contingency of memory systems in BM-belief formation to other cognitive systems. In other words, I have to show that

no other cognitive systems play a necessary role in BM-belief formation. To do this, I will introduce the notion of *valency*. Valency, here, is a neutral term; it is neither normative nor deontic. It simply means that BM-properties come in pairs, and that, at any given time, the perception of one precludes the other. Climability, for instance, comes as climbable or unclimbable, and if you perceive the rock surface as climbable for you, then it is *ipso facto* not unclimbable for you. Since BM-properties are intricately linked with action (sections 2.2.1 and 2.2.2), let us say a BM-property is *positively* valenced when it enables the performance of actions; otherwise, it is *negatively* valenced. Thus, climbable is positively valenced and unclimbable is negatively valenced. Valency is not just a subjective feature of BM-properties; it is also an objective one. If you and I perceive the climbability of the same rock surface, we do so either as climbable or unclimbable for both of us, or as climbable for you and unclimbable for me or vice-versa.<sup>20</sup> Now, consider one way no other cognitive systems play a necessary role in BM-belief formation.

Belief-formation is regulated by coherency with our web of knowledge (Cherniak 1986). If I form a new belief, my cognitive systems perform a quick check as to whether the belief coheres with my web of knowledge. Typically, basic beliefs violate this regulation, and we have seen why they do so above. Here is a recap: The perceptual belief that ‘this is a table’ is basic, such that if it conflicts with my web of knowledge, my default position is to challenge my existing beliefs and not the perceptual belief. Hence, basic beliefs are doxastically isolated from input-beliefs into other cognitive systems at the time they are formed. For non-basic beliefs, doxastic certainty is required for them to cohere with our web of knowledge. For instance, if I perceive the causal relation between a ball and a shattered glass (Siegel 2009)<sup>21</sup>, and, so, believe that ‘the ball caused the glass to shatter’, I need some degree of doxastic certainty from either my memory or some reasoning systems for this newly formed causal belief to cohere with my web of knowledge.<sup>22</sup>

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<sup>20</sup> I suspect that valency is distinctive of BM-properties, but I won’t press the issue here.

<sup>21</sup> I take it that if we perceive causal relations, as Siegel argues, then beliefs about them aren’t basic. In my understanding, causal beliefs are output by reasoning systems, and reasoning systems seem intuitively inferential. See section (2.4.1) for what being an inferential system entails.

<sup>22</sup> Often, this is so swift that we think it is unconscious, such that we reason from it being unconscious to it being non-doxastic, and if so, then the causal belief might be basic. But I think this takes the phenomenology of causation to be one and the same thing as the epistemology of causation. If you were asked why you believe that the ball caused the glass to shatter, it becomes clear that the causal belief was based on many other beliefs you already had. You will say, for example, that it is because you believe in the reality of causation, because in similar cases balls have shattered glasses, and so on. This raises Humean scruples yet again, but such scruples can be responded to without conflating the phenomenology of causation with its epistemology. After all, Hume’s worry was with the reality of causation, not with its phenomenology or epistemology.

This will be clearer if we consider, that should the glass not shatter, belief would be withheld. This happens because the memory and/or reasoning systems are not in agreement with the usual experience of balls and glasses. My experience is that the glass should have shattered, and that isn't what I am experiencing. There is a mismatch between my web of knowledge and what I am experiencing, and, so, belief is withheld. But this seems not to be what happens for most BM-beliefs. If I believe, rather, that 'the ball is catchable by me', then I need not call to mind any belief from my memory or reasoning systems for the BM-belief to cohere with my web of knowledge. The ball can only be either catchable or uncatchable by me, never both, and once I perceive it as catchable, I immediately know it is not uncatchable by me.<sup>23</sup> In this way, the BM-belief I formed on the basis of this BM-perception, also inherits this immediacy, in that we can say all that's needed for the BM-belief to cohere with my web of knowledge is for it to be perceptual. If so, then the valency of the relevant BM-property shines through. Since we can perceive BM-properties, and, since BM-perception is necessarily valenced, most BM-beliefs need no doxastic support from any other cognitive systems, at least, at the time of formation.

In short, coherence with our web of knowledge seems guaranteed in cases of most BM-beliefs, precisely because no degree of doxastic certainty is required of us when we form them. And this is because BM-beliefs are formed on the basis of BM-perception that is necessarily valenced. It is part of the nature of BM-properties for beliefs about them to be compatible with our web of knowledge. You need not recall anything from your memory or any other system for your belief about the catchability of a ball, for instance, to mesh with your pre-existing beliefs. If it is catchable by you, then it meshes, precisely because you immediately know it is not uncatchable by you, and if it is uncatchable by you, then it meshes again, precisely because you immediately know it is not catchable by you. This doesn't entail an infallible BM-perception, however. The valence of a given BM-property can certainly clash with your pre-existing beliefs, but it would work like the case of mirage. The default position is to believe that the ball is catchable by you if catchability is positively valenced for you at that time. And just as the case of mirage can be overridden, that the ball is catchable by you can also be overridden. You can become aware of some facts that would override your BM-perception (see fn. 23, below). To reiterate: BM-perception is fallible.

For emphasis: I am not saying that when we form BM-beliefs, the formation is *never* based on any doxastic inputs into other cognitive systems; rather, I am only saying that it is not necessary that

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<sup>23</sup> Perceptual learning and perceptual detailing (becoming aware of details, like the speed of the ball) might complicate matters, but the core of the argument remains. The object might stop being catchable by me when I become aware of some further detail, but, then again, that would perforce preclude me from perceiving it as catchable by me in those cases too. Valency always shines through in BM-perception.

the formation is so based. For this reason, I have opted to be liberal about the doxastic isolation constraint, and this seems wise. For whether or not some sort of inference happens among cognitive systems during belief-formation is an empirical issue that is better left for cognitive neuroscience to resolve. Moreover, not to be dismissive about the neo-Humeans' worry, it is best that this claim about the doxastic isolation constraint be moderate. I will return to the neo-Humeans' worry in section (2.4.2), and I will touch on my liberal approach to the doxastic isolation constraint again in section (2.4.1). For now, it suffices that BM-systems also meet the doxastic isolation constraint.

In sum, BM-systems meet the three constraints for basicity. BM-systems (i) result from the interplay of learned and innate constraints, are (ii) inferentially opaque, and are (iii) doxastically isolated from other cognitive systems at the time of outputting BM-beliefs. Since these constraints are the requirements for BM-systems to be reliable, such that they can output basic beliefs, and since we have seen that BM-systems meet the constraints, we can restate PMJ\*\*\* in terms of reliability:

(PMJ\*\*): a basic BM-belief is *prima facie* justified if it is the output of a reliable BM-system.

PMJ\*\* states that the reliability of the outputting BM-system is sufficient for the *prima facie* justification of BM-beliefs. The notion that perception *prima facie* justifies BM-beliefs may be controversial—that's perhaps one reason it hasn't been defended by anyone, until now—but unless there are sound and empirical reasons why *prima facie* perceptual justification is ruled out for BM-beliefs, there is no reason to reject PMJ\*\*. After all, many of our folk claims have been revised in the face of empirical evidence; the unreflective belief that *prima facie* perceptual justification for BM-beliefs is unworkable should also be so revised, precisely because I have given empirical reasons why it should be.

But there's more to the story. If the reliability of BM-systems is sufficient for the *prima facie* justification of BM-beliefs, then the story told thus far must show what is wrong in cases where a belief-forming system that is reliable fails to yield *prima facie* perceptual modal justification. One way this has been laid out is the well-known 'clairvoyance' objection to the thesis that reliability is sufficient for *prima facie* justification. In the next section, I will respond to this objection and show how PMJ\*\* survives it.

### 2.3.2 The Clairvoyance Objection

The clairvoyance objection, originally developed by Bonjour (1985) and Lehrer (1990), rejects the sufficiency of reliability for *prima facie* justification. In its current usage, the objection is fantastical, and to non-epistemologists, it comes off as orthogonal to discussions of our epistemology that isn't fantastical at all. However, since epistemology is a normative enterprise and not just a descriptive one (see section 1.3), fantastical objections are easy to come up with. Since this dissertation is an epistemological research project, I will retain the fantastical spirit of the clairvoyance objection. But since this dissertation is also a naturalistic research project, the limitation of fantastical objections, like the clairvoyance one, will be brought to fore by my arguments. In any case, the objection is that a belief-forming system can be reliable yet fail to yield *prima facie* justification. Here is a relevant example, which has been adapted from Bonjour's popular Norman's example.

Consider Tosin. Under certain conditions, which usually obtain, Tosin is a completely reliable clairvoyant with respect to BM-properties. He has no information one way or another about this cognitive ability, but simply unreflectively accepts its outputs. One day, Tosin's friend described a tree to him, and Tosin formed the BM-belief that 'I can climb the tree' on the basis of that report. As things turn out, he can. But this BM-belief is intuitively *prima facie* unjustified, even though his clairvoyance is completely reliable. If so, then Tosin's case seems to show that PMJ\*\* gets thing wrong. As we have seen, he is a *reliable* clairvoyant with respect to BM-properties, in which case, the reliability of his clairvoyance should be sufficient for the *prima facie* justification of his BM-belief. How do we move forward, then? My responses<sup>24</sup> will largely mirror Lyons' (2009) response, and, in some areas, Graham's (2011).

To begin with, we must be clear that Tosin's BM-beliefs, which he forms through his clairvoyance system aren't perceptual beliefs. At least, the one in the example above is a testimonial belief. But we know that perceptual systems must transduce some sort of energy (section 2.2.1), and since there is no energy of the relevant sort to transduce in Tosin's clairvoyance case, his resultant BM-beliefs fail to be perceptual beliefs. In which case, they fail to be basic, and, since reliability is sufficient only for the *prima facie* justification of basic beliefs, there is no objection to PMJ\*\* here.

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<sup>24</sup> I only have *responses* to the clairvoyance objection. Lyons thinks this is a problem for most reliabilist accounts: responses, he argues, do not *solve* the clairvoyance problem, rather, they only avoid it. I concede as much. He argues that to solve the problem, it must be shown that every reliable cognitive system that outputs basic beliefs also outputs justified beliefs. If he is right, then I would need a broader empiricist intuition about the cognitive systems that can output BM-beliefs. While I do have such intuitions—in section (1.4), I argued that imagination systems, for example, also output BM-beliefs—I have limited myself to perceptual systems in this dissertation.

But the case can easily be modified. We can instead say that Tosin's clairvoyance does transduce some energy. Perhaps there is a device in his brain that makes this possible. Think of this as similar to the *Terminator* in Arnold Schwarzenegger's movie of the same name, where the Terminator's memory system transduces energy just as humans' perceptual systems do. What then?

Tosin's clairvoyance system, even though it transduces energy, will fail to meet the innateness and learned constraints (section 2.3.1). Innateness, we would recall, requires that the system not have some unusual etiology. The system must have been present in the phylogenetic history of the perceiver's species. Being learned requires not just that the system have this phylogenetic feature; it must also have an ontogenetic one: reliance on it must have been trained up in an ordinary way. Tosin's clairvoyance system clearly fails to meet these constraints. It suddenly came into existence; perhaps Tosin woke up one morning and discovered that he had clairvoyance abilities. That's one reason he has no information about it. If so, then it still poses no threat to PMJ\*\*, since PMJ\*\* talks only about those cognitive systems that result from the interplay of innateness and learned constraints. But, as Graham (2011) argues, the case can yet be modified, for the issue might be just that Tosin was already an adult when his clairvoyance began to manifest. What if he was born with it, such that he has been using the ability since childhood, albeit unknown to him, and, so, he has trained his reliance on it up in an ordinary way? What then?

The clairvoyance system will fail to meet the etiological function sub-constraint. As we saw (section 2.3.1), the etiological function sub-constraint is why innateness matters to the whole reliabilist story in the first place. To remind ourselves: The etiological function sub-constraint is that, besides being the result of the interplay between the innateness and learned constraints, a cognitive system must also be performing the function it was evolutionarily selected to perform. For instance, "our perceptual competence evolved over generations to, in part, reliably represent distal objects and features of our environment, and to reliably induce true beliefs, true beliefs that in turn guide our behaviour in our surrounds" (Graham 2011: 471).<sup>25</sup> Does Tosin's clairvoyance system meet this constraint? No. Even though the system plays some behaviour-guiding roles in Tosin's life, it clearly lacks any evolutionary history. It hasn't enhanced the survival of Tosin's conspecifics; after all, Tosin is one in a million. Thus, while there is adaptation in the case of BM-systems, there is only mutation in Tosin's clairvoyant case. Consequently, as before, Tosin's reliable clairvoyance system constitutes no objection to PMJ\*\*.

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<sup>25</sup> Graham thinks that Lyons' solution to the clairvoyance objection is plausible because of this etiological function constraint. See fn. 26, below.

But we can still modify the issue. One can stipulate that clairvoyance has enhanced the survival of Tosin's conspecifics. But once this is admitted, we are licensed to give a dismissive response to the clairvoyance objection altogether. It is that either one describes the objection so determinately that it turns out to be an unusual perceptual system, or one describes it so determinately that it becomes a magical cognitive system. Lyons' (2009) seem to take the former route in his solution of the problem. He gives a counter-clairvoyance case where *prima facie* justification is undefeated:

Nyrmoon is a member of an alien species for whom clairvoyance is a normal cognitive capacity, which develops in much the same way as vision does for humans. Members of Nyrmoon's species have specialized internal organs that are receptive to the highly attenuated energy signals from distant events; as an infant, all was a "blooming buzzing confusion" for Nyrmoon, until, like everyone else, he learned to attend selectively, recognize various objects, and filter out coherent distant events.<sup>26</sup> Nyrmoon, however, is so extremely unreflective that he has no beliefs (*a fortiori*, no justified beliefs) about the reliability of his clairvoyance. One day he forms, as the result of clairvoyance, the belief that his house is on fire (which it is) (Lyons 2009: 119).

What is evident from Lyons' response is that Nyrmoon's clairvoyance is just an unusual perceptual system, and that seems to be why Lyons argues that Nyrmoon's belief that 'his house is on fire' is *prima facie* justified. However, if an objector counters by further describing a clairvoyance system that doesn't turn out to be an unusual perceptual system, perhaps, he gives some details about how clairvoyance has enhanced the survival of Tosin's conspecifics, then we can simply say the system is unnatural. In which case, it doesn't count as a valid objection for a *naturalistic* reliabilist epistemology. This way, even though fantastical objections to epistemological theories are forceful in that they challenge the normativity of the theories, we should caution our tendency to over-determinately describe them, lest the objections lose their appeal. Tosin's clairvoyance is either an unusual perceptual system or magical cognitive system, and the objector must make up his mind about which it is. And whatever he decides upon, there is prospect for a naturalistic reliabilist account of perceptual modal justification.

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<sup>26</sup> This is why Graham thinks a reliabilist story must tell us why innateness matters. He thinks Lyons' is able to diffuse the clairvoyance problem because clairvoyance is performing its etiological function for Nyrmoon's species.

Thus far, we have been considering only one direction of PMJ<sup>\*\*</sup>; i.e., cases where a cognitive system is reliable but fails to confer *prima facie* justification. What about the other direction? What happens if the system fails to be reliable, but still confers *prima facie* justification? Let us modify our counterexample to this end. Suppose that Tosin has a fully functional BM-system, but instead of being embodied, it is disembodied. Perhaps his brain is in a vat. In this case, Tosin's BM-beliefs, though all false since he is massively deceived about the world, would count in all relevant aspects as perceptual and basic beliefs. Importantly, his BM-beliefs would be justified for him. How will PMJ<sup>\*\*</sup> fare in this case?

The issue here, as explained by Graham (2011), is that even though Tosin's BM-systems are functioning fully, they aren't functioning in their normal environment. The normal environment of BM-systems, as I have argued (sections 2.2.2 and 2.3.1), is embodied: in a body in an environment. Thus, even though Tosin's perceptual systems output perceptual and basic beliefs, the beliefs would fail to be *prima facie* justified for us, but not for Tosin. This is because we know that Tosin's BM-systems aren't functioning in their normal environment, but Tosin himself, being envatted, doesn't. Hence, his beliefs would be justified for him. Justification doesn't require being meta-aware of the justification state. It is important to clarify this aspect, because, as I have made clear (section 1.3), I intend not just to describe but also prescribe the conditions under which BM-beliefs are justified. And my prescription is this: Under normal conditions, BM-beliefs are justified when they outputted by a BM-system that is reliable within its normal environment.

Thus, PMJ<sup>\*\*</sup> is immune to the clairvoyance objection that stirs up cases where there is reliability but no justification. PMJ<sup>\*\*</sup> also handles the objection that arises from cases where there is no reliability but there is justification. Even though PMJ<sup>\*\*</sup> fares better than its older sibling (PMJ<sup>\*\*\*</sup>), it is still just a thesis about *basic* BM-beliefs, and, evidently, there are cases of non-basic BM-beliefs.<sup>27</sup> Non-basic beliefs are those that are based on other beliefs, and this rules them out from being *prima facie* justifiable. Thus, PMJ<sup>\*\*</sup> cannot accommodate them. But can we fortify it to do so? If we can, can we further fortify it to accommodate basic and non-basic BM-beliefs in the face of defeaters? That is, can we get *ultima facie* justification from such an account of *prima facie* justification? I answer these questions in the next section.

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<sup>27</sup> I should clarify that even though 'basic BM-belief' when written fully is 'basic basic modal belief', the first and the second 'basic' do not mean the same thing. The 'basic' in *basic* modal belief captures the kind of modality that the belief is about—it is about the everyday kind of modality (section 1.4). Whereas, the 'basic' in *basic* basic modal belief captures the epistemic status of a belief that is about the everyday kind of modality. This way, the first 'basic' is ontological; whereas, the second 'basic' is epistemic.



## 2.4 Perceptual Modal Justification: Non-basic BM-beliefs

To account for the prima facie justification of non-basic BM-beliefs, we must look beyond the fact that non-basic BM-beliefs are also the *outputs* of perceptual systems. This is because, as we have seen (section 2.3), being the output of a perceptual system only guarantees the prima facie justification of *basic* BM-beliefs. How then would a reliabilist modal epistemology account for the prima facie justification of non-basic BM-beliefs? What else can carry the required epistemic load besides the reliability of the belief-forming process? I consider one option in this section.

### 2.4.1 Inferential Modal Justification

In section (2.3.1), I argued that basic BM-beliefs are not *always* based on doxastic inputs into other cognitive systems at the time they are formed. This directly gives one way of cashing out the formation of non-basic BM-beliefs: They *are* based on doxastic inputs into some other cognitive systems at the time they are formed. Intuitively, this basing relation would go on ad infinitum if the base-beliefs weren't themselves formed without doxastic supports from other cognitive systems, at some point. But this is no serious hurdle. Since I have said that basic beliefs are precisely the kind that don't need such supports, let us say that, at some point, the base-beliefs involved in the basing relation that yield non-basic BM-beliefs are basic. This way, regress is eliminated.

Since the base-beliefs are basic, they are *ipso facto* prima facie justified. But their prima facie justification won't be sufficient to justify non-basic BM-beliefs. This is because basicity might get lost during the inferential process; in fact, it often does. That, in part, is why non-basic BM-beliefs are defined as "requiring doxastic supports from other cognitive systems". Thus, more is needed than just the basicity of base-beliefs to account for the prima facie justification of non-basic BM-beliefs. One way to cash out what this additional feature could be, is by saying that the basing relation itself contributes in some ways to the prima facie justification of non-basic beliefs (Alston 1988). Perhaps the basing relation ensures that basicity survives the inferential process. How would this work?

Earlier (section 2.3.1), I explained that Lyons (2009) argues that the reason some philosophers, like Goldman (1979), are liberal about the doxastic isolation constraint is that they fail to specify the notion of 'basing/inference' involved when beliefs are based on other beliefs. I said then that I would return to his specification; I will do so now.

Recall that the doxastic isolation constraint blocks doxastic supports from other cognitive systems, so that the resultant belief can be basic (section 2.3.1). I explained then that perceptual systems typically violate this constraint. Besides perceptual systems, memory systems also do. Consider my

memory belief that ‘I ate bread yesterday’. Even though my memory system seems to output this belief because I had the (possibly perceptual) belief that ‘I am eating bread’ yesterday, the new (memory) belief—that ‘I ate bread yesterday’—seems not to be based on the old (perceptual) belief. The old belief is no longer occurrent and not tokened at the time my memory systems output the memory belief, and to be epistemologically relevant, a belief “needs to be occurrent ... That is, it needs to be tokened at the time of the inference” (Lyons 2009: 172). Since the old perceptual belief isn’t tokened at the time of inference, we can conclude that it isn’t epistemologically relevant to the new memory belief.

Thus, even though memory systems are belief-dependent systems, they do not base their output-beliefs on their input-beliefs in the relevant sense. I will specify this sense shortly. Input-beliefs into memory systems are diachronic not synchronic, where diachronic inputs are old and non-occurrent. (I will say more about this distinction in section (3.3).) Hence, Goldman was liberal about the doxastic isolation constraint since memory systems violate it even though they output basic beliefs. The solution, according to Lyons, is to take the basing relation to be, *ab initio*, “a psychological, not an epistemic, relation” (2009: 138). Children, animals, and even modules/systems base beliefs on other beliefs all the time, or they engage in inference all the time, yet they lack the concept of evidence. For instance, “The visual system takes shading as evidence for shape; it takes discontinuities as evidence for object boundaries” (Lyons 2009: 139), and it would be nonsensical to say the visual system *has* evidence for anything. This psychological notion of inference, he argues, is univocal. It is what those in the Helmholtzian tradition, for example, mean when they say perception is necessarily inferential.

If we follow Lyons and take inference to be psychological, we would see that even though memory systems base their outputs on inputs in the psychological sense, they do not do so epistemically; i.e., the content of the first is not based on the content of the second. (This is the relevant sense that I said I would specify.) And clearly, memory systems do not epistemically base their output-beliefs on their input-beliefs, even though they do psychologically. Thus, Lyons concludes, only in the epistemic sense of inference do output perceptual and memory beliefs come out as non-basic.<sup>28</sup> Thus, there is a *psychological* and *epistemic* sense of inference, and in his view, an oscillation between these two senses is what allowed liberalism about the doxastic isolation constraint. It is obvious that for our purposes, the relevant sense of basing/inference is the epistemic sense; so, it will be the sense in which I will talk about inference in the remainder of this chapter. But I should disclaim

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<sup>28</sup> Another useful implication of this distinction is that it gives room for unconscious evidence. Your cognitive system might base its belief on another belief, but you might not.

that I won't try to answer when or how frequently BM-systems engage in inference in what follows. As I have said (section 2.3.1), such issues are empirical ones that are better left for cognitive neuroscience to resolve. Having clarified basing/inference, let us return to how inference carries the required epistemic load in the justification of non-basic BM-beliefs.

If a cognitive system is (epistemically) inferential, its outputs would be non-basic. For the outputs would be based on some other belief; i.e., the content of the first belief will be based on the content of the second one. This way, perceptual systems are non-inferential, since we've already established that they output basic beliefs. BM-systems then, in virtue of being perceptual subsystems, are also non-inferential when they output basic BM-beliefs. We might say then, that the reason any cognitive system outputs basic belief is because it is non-inferential.<sup>29</sup> But the issue, as Lyons explains it, isn't so finely defined. It is possible that a non-inferential system sometimes operates inferentially. For instance, perceptual systems, although typically non-inferential, can be top-down influenced by cognition, in what is famously called 'cognitive penetration'. This seems to be an inferential operation of perceptual systems.<sup>30</sup> (I will focus on cognitive penetration in section (2.4.2).) Thus, we must further qualify: Only when a non-inferential cognitive system is operating non-inferentially can it output basic beliefs.

BM-systems are typically non-inferential, although they can sometimes operate inferentially. This aligns with my arguments thus far: BM-systems sometimes output BM-beliefs as basic, and sometimes, as non-basic. Our present concern is explaining how BM-systems are reliable when they output BM-beliefs as non-basic. The story thus far is that, when they output BM-beliefs as non-basic, the base-beliefs are basic beliefs, and that BM-systems are operating inferentially at such times. That is, the non-basic BM-beliefs are (epistemically) based on some basic beliefs. This way, the inference between the non-basic BM-belief and the basic beliefs would be reliable, since the basicness of the base-belief would transfer to the based-belief via their contents. Lyons calls this sort of inference, *basic* inference.<sup>31</sup> A basic inference is the inferential operation of a non-inferential cognitive system. Perceptual, and *a fortiori*, BM-systems are such systems; the inferences that they engage in (when they are operating inferentially, of course) is basic. Thus, even though some BM-beliefs are output by BM-systems when operating inferentially, they could still be *prima facie* justified if the relevant inference is basic. Let us concretise this.

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<sup>29</sup> Lyons calls such systems *primal* systems. I have not introduced the notion here for simplicity's sake.

<sup>30</sup> Since Lyons interprets the doxastic isolation constraint strictly, it is unclear whether he would agree to this.

<sup>31</sup> "A basic inference is one that results from the inferential operation of a primal system (a nonbasic inference is any other inference)" (Lyons 2009: 171). See fn. 29, above, for what primal systems are.

Suppose the Humeans are correct and memory or some other cognitive system necessarily features in the formation of BM-beliefs. This way, BM-beliefs become non-basic. Now, suppose we are considering whether the belief that ‘a rock surface is climbable by me’ is *prima facie* justifiable. The Humeans will want to issue a straightforward ‘no’, but we should ask for some moments of reflection. We should ask them what sort of beliefs the BM-belief could be based on. We should ask them what are the base-beliefs? Since their worry is that familiarity plays a necessary role in BM-belief formation (sections 2.2.1 and 2.2.2), memory beliefs are the primary candidates. But we have just seen that memory beliefs are basic beliefs, such that when they are the base-beliefs in an inference that yields non-basic BM-beliefs, the inference is basic. In which case, the BM-belief, even though non-basic, is *prima facie* justified. (I will return to this again in section (2.4.2).)

The advantage of putting the epistemic burden on basic inference is that it lifts the need of having conscious access, doxastic or otherwise, to this inference.<sup>32</sup> In fact, we typically do not: “The fact that certain of my subpersonal modules base their outputs on certain premises does not mean that these outputs are based *for me* on these premises, or on anything else” (Lyons 2009: 141). This is why the account under construction is reliabilist—for us, the inference is psychological, even though it is epistemic for our BM-systems. Thus, we can modify PMJ\*\* to accommodate the *prima facie* justification of non-basic BM-beliefs:

(PMJ\*): a BM-belief is *prima facie* justified if it is the output of a reliable BM-system, or results from a basic inference.

PMJ\* fares better than earlier formulations in that it accounts for the *prima facie* justification of both basic and non-basic BM-beliefs. Hence, the removal of ‘basic’ in its right-hand side. But despite its virtues, there are grounds that PMJ\* hasn’t covered. For instance, the problem of underspecifying the clairvoyance objection, which Lyons (2009) says almost all reliabilist account of perceptual justification face (see fn. 24, above), is still unaddressed. This isn’t particularly damaging to my account; I have already disclaimed that I won’t be giving a comprehensive account of perceptual modal justification (section 2.1). The conditionality of PMJ\* is sufficient for my purposes: What conditions, if met, will bring about *prima facie* perceptual modal justification? My answer: The reliability of BM-systems and the reliability of the inference BM-systems engage in. What is left, then, is an account of defeaters, so that we can get an account of *ultima facie* justification.

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<sup>32</sup> See, for example, Berger (2014) and Berger et al. (2018) for how and why perceptual justification can and should occur below or outside consciousness.

### 2.4.2 Undefeated Perceptual Modal Justification

One straightforward way PMJ\* could fail to work is for the reliability of basic inferences to be reduced. I have said (section 2.4.1) that this often happens in cases of cognitive penetration. How? Consider the BM-belief that ‘a tree is climbable for me’. Humeans would make us believe that I formed this BM-belief based on some inference from some beliefs about my past experiences, perhaps the *a priori* belief that ‘trees that look like the current one, are climbable for me’. That is, my memory or induction systems are activated when I formed the BM-belief, such that the BM-belief is now epistemically based on the output-beliefs of those other systems. In short, the BM-belief is non-basic in all relevant senses.

Even though I have just argued (section 2.4.1), that non-basic BM-beliefs can still be *prima facie* justified, neo-Humeans might insist that they aren’t *ultima facie* justified even though they are *prima facie* justified. That, even though memory or induction systems aren’t featuring bottom-up in the belief-formation, they feature top-down in it. That I am able to form the BM-belief only because some of my cognitive states are influencing my perception, and I am confusing this as a case of BM-perception. In short, that the reliability of the basic inference involved in the formation of the BM-belief has been significantly reduced, in which case, its *prima facie* justification is defeated. Otherwise put, the neo-Humeans’ new worry is that BM-beliefs are just disguised products of cognitive penetration (CP) (cf. Brogaard and Chomanski 2005).

But even if we grant that BM-beliefs are products of CP, it isn’t clear why they would always be defeated just because of this. To clearly see why, let us consider what CP is. CP is the idea that what we see (hear, taste, etc.) is influenced by our cognitive states, like beliefs, desires, expectations, and so on. Even though CP remains a controversial empirical thesis (cf. Zeimbekis and Raftopoulos 2015), its epistemological implications have been extensively researched (e.g., Siegel 2011, 2017; Lyons 2011). Standardly, CP poses a significant challenge to perceptual justification. Consider the following from Siegel to make this clear: “Suppose Jill believes that Jack is angry at her, and this makes her experience his face as expressing anger. Now suppose she takes her cognitively penetrated experience at face value, as additional support for her belief that Jack is angry at her (just look at his face!)” (2011: 202). Intuitively, Jill’s belief is not justified, or its justification is defeated, and there are competing explanations as to why.

Internalists (e.g. Siegel 2011, 2017) say this lack or defeat of justification is because Jill’s experience has the wrong kind of etiology. Externalists (e.g. Lyons 2011) say it is because the reliability of Jill’s belief-forming process has been reduced. Since my account is reliabilist, we can expect that it’ll align with this externalist analysis. Does it? Yes. To see this, we must note that CP isn’t always bad

news. For instance, perceptual learning is sometimes taken as a form of CP (e.g. Hall 1995; Lyons 2011), and the success of any epistemology to accommodate perceptual learning is generally taken as virtuous. Why then should BM-beliefs elicit negative reactions just because they are products of CP, if at all they are? I take it that what follows from the claim that BM-beliefs are products of CP, is that in some cases, *prima facie* justification would be defeated, and in some cases, it won't. The relevant question then is this: How do we tell the difference between good and bad cases of BM-beliefs when construed as products of CP?

Since CP is the top-down influence of cognitive states on perception, let us call any system that outputs such penetrating cognitive states a *hijacking system* (cf. Siegel 2017). This means that hijacking systems would output the beliefs upon which BM-beliefs are based in CP; i.e., hijacking systems would output the base-beliefs in CP.<sup>33</sup> Now, the relevant question is this: What systems would count as hijacking systems, such that we know whether the base-beliefs are basic or non-basic? We will know this because we already know that the inference involved in the formation of BM-beliefs is justificatorily salient, since it inherits the basicity of its base-beliefs (section 2.4.1). Thus, if we know what systems are hijacking systems, then we will know when CP is bad and when it is good. The good cases of CP would correspond to when the base-beliefs are basic, and the bad ones, to when the base-beliefs are non-basic. In addition, the good ones would correspond to when the *prima facie* justification of BM-beliefs are undefeated, and the bad ones, when it is defeated.

There are many hijacking systems, and I need not address every possible case; it is sufficient to address only the most obvious. Thankfully, the neo-Humeans' insistence that familiarity plays necessary roles in the formation and justification of BM-beliefs, brings to fore the obviousness of some hijacking systems. I take it that the neo-Humeans' intuition that the *prima facie* justification of BM-beliefs is defeated seems very strong to them, because they think I haven't done enough to address the concern that memory and induction, among other cognitive abilities, play integral roles in the formation and justification of BM-beliefs. Thus, I will focus on memory and induction systems as hijacking systems. I will begin with induction systems.

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<sup>33</sup> This is why I think that perceptual systems, *pace* Lyons, operates inferentially also (see fn. 30, above). If I am correct, then it isn't just wise to be liberal about the doxastic isolation constraint (section 2.3.1); being liberal about it seems to be the most probable choice. Perceptual systems seem to be the only example anyone who wants to be strict about the doxastic isolation constraint can use as a case study. Hence, Lyons' position that we should be strict about the constraint on the premise that perceptual systems never fail to be doxastically isolated from other cognitive systems. However, if the above claim about cognitive penetration is correct, then it is highly unlikely that there are any cognitive system, which never fails to be doxastically isolated from other cognitive systems. Goldman and myself may be closer to the truth than Lyons is.

Induction is a reasoning process; so, inductive beliefs would be output by some reasoning systems. Let us keep calling these systems *induction systems*. If so, and since any “reasoning system would base its outputs on the premises it takes as inputs” (Lyons 2009: 140), induction systems would output non-basic beliefs. This, then, makes induction systems epistemically inferential ones, in which case, the inference involved here is a non-basic inference. We immediately see that this case of CP will be bad. It will be bad because induction systems, in virtue of being epistemically inferential, yield non-basic base-beliefs, and, so, reliability lapses or is reduced. This aligns with the externalist analyses, given above, for why bad cases of CP are epistemically pernicious—because they reduce the reliability of the belief-forming system. Thus, when induction systems are the hijacking systems, the *prima facie* justification of the resultant BM-beliefs is hijacked by induction, and, so, is defeated.

Not so for when memory systems are the hijacking systems, or, to what amounts to the same thing, when the base-beliefs are memory beliefs. We have already seen that memory systems are epistemically non-inferential systems, or that memory beliefs are basic beliefs (section 2.4.1). In which case, the involved inference is a basic inference. We then immediately see, as before, that this case of CP will be good. It will be good because reliability isn’t reduced or is maintained or is increased. This, again, aligns with what externalists say with regards to why good cases of CP are good—because they increase, or, if they fail to increase, they maintain, the reliability of the belief-forming process. In which case, the *prima facie* justification of the resultant BM-beliefs wouldn’t be hijacked by memory, and, so, it is undefeated.

Intriguingly, the supposed integrality of memory to the formation and justification of BM-beliefs seems to be the primary intuition of the neo-Humeans. They cling to it more than they cling to the supposed integrality of induction to the formation and justification of BM-belief. For them, familiarity with similar experiences is necessarily involved not just in BM-perception, but also in the formation and justification of BM-beliefs. The perceptual subject might be a child that lack the proper inductive tools, or a non-human perceiver that lack the tools altogether. But every perceiver has memory systems, and it works just fine in young and old. However, if I am correct, that when memory systems are the hijacking systems, *prima facie* justification is not in trouble at all, then neo-Humeans need to soften their stance, if not jettison it completely. For, upon reflection, it is self-undermining. It does them no good to insist that memory is integral to the formation and justification of BM-beliefs, since it advances my interest, not theirs. Let me give another reason why neo-Humeans should jettison their stance, if the one I just gave isn’t sufficiently convincing.

Neo-Humeans want to insist that perception doesn't play a necessary role in the justification of BM-beliefs, perhaps because of their theoretical assumption concerning perceptual content, which is that it is exhausted by the actual. But this is just an 'expectation', for we have seen that perceptual content, after being juxtaposed in light of neuroscientific findings, isn't exhausted by the actual. If so, then neo-Humeans have expectations concerning what could be represented in perceptual content, and once any theory fails to comply with these expectations, they start to cry foul. They want to insist that we do not "sense modality with our sense modality"<sup>34</sup>; that we only are inferring from past experiences, such that we misconstrue this remembering and inductive acts from the experiences as perceptual acts. But this objection is itself cognitively penetrated in a bad way, for expectations are, generally, taken to be bad cases of CP. Consider the following example.

If, by *wishing* that I am an expert rock climber, I believe that 'the famed El Capitan 900m vertical rock surface is climbable by me', then my BM-belief is *prima facie* unjustified. That I can climb the El Capitan's surface shouldn't be justified by my expectation. Expectations do not make things happen, and I surely won't be able to climb the El Capitan's surface just because I wish I can.<sup>35</sup> Reliability lapses when CP is expectation-centred.

Thus, when the neo-Humeans come to the table, guns blazing, contending that the *prima facie* justification of BM-beliefs is defeated just because BM-beliefs are supposedly products of CP, they are merely wishing things into reality. They come with expectations of seeing memory and induction at work in BM-perception, BM-belief formation, and BM-justification. Their expectations are already top-down influencing their perception, such that they can only see things from the perspective of these expectations. They are in the same boat as Jill, whose belief is unjustified experiences Jack's face as expressing anger because she believes he is angry with her. In which case, they aren't justified in holding the belief that 'BM-beliefs are never justified because they are always products of CP'. If they shed their expectations, it is more likely that, like me and some others,<sup>36</sup> they would see some truth in how perception inherently has BM-contents (section 2.2.1), how BM-beliefs are perceptual beliefs (section 2.2.2), and how BM-beliefs are *prima facie* justifiable (sections 2.3 and 2.4.1).

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<sup>34</sup> This phrase is taken from the title of Nanay (2011b).

<sup>35</sup> Compare perceptual learning. If by *learning* to be an expert rock climber, I perceptually believe that 'the famed El Capitan's 900m vertical rock surface is climbable by me', my BM-belief is intuitively *prima facie* justified, for precisely the same reasons that my expectation belief isn't justified. This is one reason most theorists consider perceptual learning as a good case of CP.

<sup>36</sup> James J. Gibson and most affordance theorists, Bence Nanay, Timothy Williamson, and Barbara Vetter to name but a few.



Generally, for neo-Humeans and non-Humeans alike, there is a lesson here for how much value we have placed in Hume when it comes to modal epistemological matters. We are in this situation regarding the non-modal content of perception, the non-perceptuality of BM-beliefs, and the non-perceptual justification of BM-beliefs because we took Hume very seriously. It is not that we should take him seriously at all, but we shouldn't take him seriously in psychological matters. And as we have seen, at bottom, the controversy at hand is psychological, in fact, meta-psychological. (Meta)psychological claims should be all and only those that are arrived at after due empirical investigations have been carried out, or after findings of those investigations have been listened to. The Humean metapsychological claim does neither. One might wonder, then, how it gained so much influence on anything modal epistemological. Whereas, the conclusions in this chapter have such empirical support, and, so, one might wonder why they are being met with incredulous stares.

Anyways, even if BM-beliefs are just disguised products of CP, their *prima facie* justification is only defeated when the hijacking system is an epistemically inferential one, like induction systems. But when the hijacking system is an epistemically non-inferential one, like memory systems, and the neo-Humeans want to insist on this, as they often do, the *prima facie* justification of BM-beliefs is, in fact, not threatened. I concede that I haven't talked about all forms of defeaters for *prima facie* perceptual modal justification;<sup>37</sup> I have only talked about CP. But CP is often taken to be one of the commonest forms of defeaters for perceptual justification (Siegel 2011), such that a detailed analysis of how PMJ\* avoids CP may be generalised to other forms of defeaters. If so, then no theory-laden clause is required to accommodate defeaters in our perceptual modal justification thesis. Thus, we can refine PMJ\*:

(PMJ): a BM-belief is *ultima facie* justified if it is the output of a reliable BM-system, or results from a basic inference, and is not defeated.

I think PMJ gets things just right. If a BM-belief is basic, then the reliability of the outputting BM-system is sufficient for its *prima facie* justification. If the BM-belief is non-basic, then the reliability of the inference, which the outputting BM-system engages in, is sufficient for its *prima facie* justification. For any BM-belief, basic or non-basic, to be *ultima facie* justified, it must be *prima facie* justified in either of the above ways and not defeated. Perception, for all intents and purposes, can justify most of our BM-beliefs.

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<sup>37</sup> There is also bootstrapping, but I take it that bootstrapping is neither a serious nor legitimate objection to perceptual justification. Simply, bootstrapping is when all the evidence there is for the reliability of a process are experiences of when the process was reliable. But we need no additional evidence besides *perceptual* evidence for the reliability of perception. I discuss this further in section (3.4.1).

## 2.5 Summary

In this chapter, an account of perceptual modal justification was the target. The chapter began by arguing against the Humean metapsychological thesis and establishing the idea that perception has inherently basic modal contents. It continued, throughout, to campaign against any noticeable remnant of this Humean thesis. It was explained that basic modal beliefs are perceptual because they are the outputs of a perceptual system. The reliability of such a perceptual system became the bedrock for an account of perceptual modal justification that is non-doxastic, non-experientialist, non-coherentist, non-phenomenalist, but reliabilist, foundationalist, and partially inferentialist.

Despite the potential of the account, it has one significant shortcoming: it only accounts for one of the two families of modality. It only accounts for basic modality, leaving philosophical modality behind. To remind ourselves, philosophical modality is the kind that often occur in sophisticated philosophical and scientific reasoning, like the possibility of a perfect being or the possibility of a 10-dimensional plane. One reason this shortcoming holds is that philosophical modalising involves abstractions that transcend what perception can deliver. Thus, to explain the justification of our beliefs about philosophical modality, we have to look towards other justificatory sources besides perception. In the next chapter, I consider imagination as one such source.

# Chapter 3

## Modal Psychology: Justifying Philosophical Modal Beliefs via Imagination

### 3.1 Introduction

In the previous chapter, I defended an account of how perception justifies beliefs about basic modality—the modality that seems to be useful for everyday reasoning and acting. In the summary of the chapter, I explained that perception alone cannot justify beliefs about philosophical modality—the modality that often occurs in sophisticated philosophical and scientific reasoning—but that imagination possibly can. In this chapter, I consider how imagination may do so. In section (3.2), I explain how imagination delivers philosophical modality, by considering the cognitive architecture of imagination. In section (3.3), I build on this architecture and defend an account of imaginative modal justification for philosophical modal beliefs. In section (3.4), I consider one important objection the account faces; namely, that it is self-verifying. Section (3.5) summarises the chapter.

In section (1.5), I clarified that we can't just turn the wheel and get an account of imaginative modal justification from the defended account of perceptual modal justification—both accounts, I stressed, are independent of each other. The cognitive architecture of imagination must be studied to get an account of imaginative modal justification. This is what I intend to do in this chapter. To do this, I will be concerned with propositional imagination, but I will sometimes refer to experiential imagination. Philosophical modality trades in abstracta, which have less foothold in the perceptual realm. In addition, philosophical modal (PM) beliefs seem to be non-basic beliefs, and, so, I won't speak in terms of *prima facie* and *ultima facie* justification in this chapter.

## 3.2 Imagination and Philosophical Modality

The primary charge of any epistemology of philosophical modality is to make clear how the cognitive faculty it postulates as our epistemic access can accurately track philosophical modality. Following a standard practice in modal epistemology, I took imagination to be one possible source of such epistemic access (section 1.4). It seems true that imagination can deliver correct possibility judgments in everyday cases. If you ask me, for example, whether it is *possible* to drive a regular car through a normal house door, I would answer correctly, “No, not unless you break down some walls”. I need not try to drive a car through a house door or consult pictures of a car and a house door, to give this correct answer. All I have to do is retrieve my pictorial representations of cars and house doors, simulate them, and see whether the scenario put by your question is possible. Everyday imaginative acts do deliver correct possibility and impossibility judgments.

What I want to do in this chapter is to see whether the same constraints that enable imagination deliver correct modal judgments in everyday cases, can enable it do so in cases of philosophical modality. That is, I want to address this primary charge—how imagination can accurately track philosophical modality—by taking precedence from the success of imagination in delivering correct modal judgments in everyday cases. (The obvious challenge here is that, unlike in basic modality, the correctness of imagination in philosophical modality isn’t verifiable. I will address this shortly (sections 3.2.2 and 3.3.1).) But my approach, as I have made clear (see section 1.4), will be psychologically informed. How I will go about this needs to be laid out, since the psychology of imagination isn’t as clearly defined as the psychology of perception. Unlike perceptual sense organs, there isn’t an imagination sense organ that can be studied by cognitive neuroscience, and, so, everyone seems to agree that there is no imagination module (see also, section 1.5, below).

Imagination, as I roughly defined it (section 1.4), is a speculative mental state. As a result of this speculative nature, most available works on the psychology of imagination are, in turn, speculative; i.e., not grounded in neuroscientific findings. This is not to say that neuroscientific study of imagination isn’t feasible; they might be—neuroscience is not complete. Rather, that most available works on the psychology of imagination are speculative only means that, at the moment, the philosophically interesting accounts of the psychology of imagination are speculative theoretical psychology (e.g., Leslie 1987; Goldman 1992a; Currie 1995; Nichols and Stich 2003; Carruthers 2002, 2006). I won’t say much about whether or not speculative theoretical psychology is *psychology* here; it is sufficient for our purposes that some respectable philosophers (e.g., Ruth Millikan) take speculative psychology seriously as a substantive research area in philosophy of mind.

What I want to do then in this chapter, is draw on some of these speculative works about imagination that were developed to make sense of imagination and see whether there's any prospect for psychologising philosophical modality. Thus, unlike in Chapter 2, where much of the argumentation involved findings from cognitive (neuro)science, much of the argumentation in this chapter will involve hypotheses from speculative theoretical psychology. Although I do draw on some neuroscientific findings later (section 3.3.2), most of what I take to be the primary premises of my arguments are based on speculative hypotheses about what constitute the psychology of imagination. Even though the hypotheses aren't specifically tailored for modal psychology, I will be appropriating them here for that purpose. But I won't just be turning the wheel to get a psychology of imagination for philosophical modality from the psychology of imagination for basic modality; I will give constraints on how the latter can give rise to the former. The advantage of this is that I cannot be accused, later, of reverse engineering imagination to give the results I want for modal psychology.

But to satisfactorily psychologise philosophical modality, it must be clear that imagination can deliver philosophical modality, and, if it can, whether the psychological explanation given for how it does so, can accommodate the different ways philosophers use imagination to philosophically modalise. Specifically, it is typical that philosophers disagree about the imaginability of a certain scenario, and a psychological account of how imagination delivers philosophical modality that's worth its salt should be able to explain this disagreement. In giving a psychological account of imaginative modal justification, then, three issues become relevant: the cognitive architecture of imagination must be able to (i) accommodate philosophical modality in a way that (ii) imagination-training within philosophical modalising is also accounted for, and then (iii) explain how we form philosophical modal beliefs. I will address (i) in section (3.2.1), (ii) in section (3.2.2), and (iii) in section (3.2.3). Section (3.2.1) may come off as overly optimistic, but this will be balanced out by the constraints on truth-tracking that section (3.2.2) will introduce.

### **3.2.1 Psychologising Philosophical Modality**

In section (3.2), I listed some speculative accounts of the psychology of imagination. Among them, Nichols and Stich's (2003) account stands out for our purposes. This is because, unlike the rest, Nichols and Stich explicitly say that their account doubles as a theory of imagination: "[Our account] might be offered as a theory of imagination (and, indeed, *we maintain that it is a plausible theory of imagination*)" (Nichols and Stich 2003: 37, my italics). Thus, I will follow their account

closely here, since there won't be any challenge of misappropriation.<sup>1</sup> Nichols and Stich use everyday examples to flesh out how the account works, perhaps because their goal is pretence. But since my goal is philosophical modality, I will appropriate the account using mostly examples that are directly cases of philosophical modality.

Nichols and Stich build their account of the architecture of imagination on a standard model of the basic architecture of the mind; namely, the perception/belief/desire/motor-control architecture, which is widely accepted among philosophers of mind and cognitive scientists as a model for almost all animals that possess some sort of central nervous system. Building the architecture of other distinctively human capacities on this basic architecture affords both unity and simplicity of explanations, and, so, it is a wide practise. For Nichols and Stich, building an account of the architecture of imagination on this basic architecture model of the mind requires three additional boxes: an 'imagination box', an 'updater', and an 'imagination generator',<sup>2</sup> as depicted in fig. 3.1, below.<sup>3</sup> (All three boxes are in the far-left of the figure.) Talk of 'boxes' here doesn't imply that the mental representation tokens located in a box share a spatial location in the mind; rather, it is meant that they share an important cluster of causal properties that are not shared by other representation types.

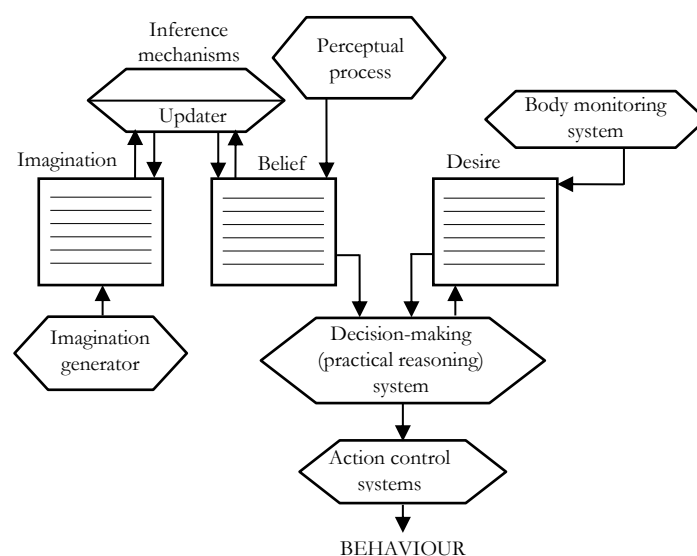


Fig. 3.1 Nichols and Stich's account of the architecture of

<sup>1</sup> In a standalone work, Nichols (2006a) argues that using the cognitive architecture of imagination to psychologise philosophical modality might show that imagination isn't reliable when used for philosophical modalising. My inclinations are different from his. I think laying out our psychology when we philosophically modalise, as I will do in this section, might illuminate the reliability of imagination when used for philosophical modalising. I will respond to Nichols' argument in section (4.2.2).

<sup>2</sup> They call the imagination box, 'possible world box', and the imagination generator, 'script elaborator'.

<sup>3</sup> Carruthers (2002, 2006) thinks there is no reason to postulate these boxes. He argues that imagination comes to us for free: experiential imagination comes for free with perception, and propositional imagination comes for free with language. See fns. 6, 12, and 19, below, for why I pitch my tent with Nichols and Stich here.

The imagination box is a “workspace in which our cognitive system builds and temporarily stores representations of one or another possible [scenario]” (Nichols and Stich 2003: 28). As they explain it, imagination episodes begin with an imagination premise, which is the basic assumption about what is to be imagined, such that without it, an imaginative act can’t get started. For instance, a representation token, like *consciousness is contingent*, can be the imagination premise for an imagination episode with the content, *zombies are possible*. But, clearly, this initial premise won’t be sufficient to yield the possibility of zombies. To bridge this gap, Nichols and Stich “assume that in addition to the [imagination] premise, the cognitive system puts the entire contents of the Belief Box into the [imagination] Box” (2003: 29). This way, they argue that there will be enough premises to yield the target imagining. The challenge here is that some beliefs will be incompatible with the imagination premise, and, so, they may block the target imagining from forming. According to Nichols and Stich, the updater ensures that this doesn’t happen.

The updater’s job is to filter out representation tokens that are incompatible with the imagination premise. For instance, getting to *zombies are possible* from the combination of the imagination premise (*consciousness is contingent*) and all our beliefs, would require that some nomological beliefs about rationality be set aside. Perhaps we would have to be flexible about rationality, and that would require suspending the belief that ‘consciousness is indispensable to rationality’. The updater’s power isn’t just limited to incoming beliefs, however; it can also remove the imagination premise itself (Nichols and Stich 2003: 32). For instance, the imagination premise, *consciousness is contingent*, may be put into my imagination box if you ask me to entertain the possibility of zombies. But after my beliefs have been added to it, I might end up imagining that ‘zombies aren’t possible’. This would then mean that for me, consciousness isn’t contingent, and, so, the updater will remove the imagination premise from my imagination box. By implication, the updater would also be able to remove stored imaginings from the imagination box; perhaps in cases where I want to imagine something that contradicts what I had imagined in the past.

The reason Nichols and Stich postulate the updater is that the mind can update beliefs in the face of a newly formed belief that is incompatible with our existing beliefs. They think something must be responsible for this updating process. Hence, the updater.<sup>4</sup> (I will say more about this in section (3.4.1).) But, if this is correct, then it is plausible that the updater would be sensitive to the

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<sup>4</sup> But one might wonder whether the updater does the same job in imaginative and non-imaginative acts, or whether one and the same mechanism is at work in both. After all, it seems that, in the case of belief-formation, it is *updating*, but *filtering* in the case of imagining-formation. It might just be unfortunate labelling on Nichols and Stich’s part, or perhaps, they mean that the updater does both filtering and updating jobs in imaginative episodes.

intentions of the individual. It is plausible that when we consciously try to believe or imagine an impossible scenario, for example, the updater will filter out beliefs it wouldn't ordinarily have filtered out, or vice-versa. For instance, suppose you want to imagine the possibility of impossible objects (supposing that you can), as against imagining the possibility of flying pigs. It seems clear that your updater will filter out some logical and nomological beliefs in the former case, which it won't filter out in the latter. This is because beliefs about mass, gravity, and so on, which bear on the existence of physical objects would constrain your imagination in the latter case, but not in the former. An impossible object may just lack mass, gravity, and any known physical property altogether.

In any case, it suffices that the updater does an important job during imaginative processes. Without it, our inference mechanisms wouldn't have the relevant and appropriate premises (the imagination premise and our unfiltered-beliefs) to work with, so as to yield our target imaginings. But our imaginings are often so rich and detailed that our beliefs can't provide the needed premises. For instance, in imagining the possibility of zombies, I might also imagine a zombie world; i.e., I might imagine not just individuals who lack consciousness but a world where there is no consciousness at all. The natural question that comes to mind then is this: Where do such non-inferable details come from? After all, it is very much possible that nothing in my existing beliefs can get me to imagining zombie worlds, even though my beliefs might get me to imagining zombie individuals. Nichols and Stich's answer is that the non-inferable details come from the imagination generator.

The imagination generator's job is to fill "in those details of [an imagination episode] that cannot be inferred from the [imagination] premise, the (updater-filtered) contents of the Belief Box and the [imaginee's] knowledge of what has happened earlier on in the [imagination]" (Nichols and Stich 2003: 35). But how does the imagination generator achieve this? In the preceding paragraph, I said that there might be *nothing* in my existing beliefs that can get me to imagining zombie worlds, even though my beliefs might get me to imagining zombie individuals. This presupposes that there are *things* in our beliefs that aid the unfolding of events we form beliefs about. Following a tradition in cognitive psychology, these things are called 'scripts' (Schank and Abelson 1977). Scripts are psychological paradigms encoded in some beliefs, possibly the complex ones, which detail how certain situations typically unfold: "A script is a structure that describes appropriate sequences of events in a particular context" (Schank and Abelson 1977: 41). Nichols and Stich think scripts enable us to imagine scenarios we haven't explicitly believed. Consider the following example to make this clear.



If I am acquainted with Moroccan eating etiquette and you aren't, I might be able to make sense of the following story and you might not: "John went to a Moroccan restaurant, and, after washing his hands, he left". For you might ask: "Why didn't he eat; why did he just wash his hands and leave?" Your imagination about the story was limited because your restaurant script isn't as detailed as mine. It is part of Moroccan etiquette to eat with hands, and, just by hearing that John went to a Moroccan restaurant and left after washing his hands, I can fill in the gaps, that he already ate, and that that was why he washed his hands and left. Analogously, we have many different scripts for different repetitive events, and I think there is no reason to rule out zombie scripts and other scripts for different philosophical modalities. At least, philosophical modal (PM) reasoning is as repetitive for philosophers and scientists as eating in a restaurant is for many people. In which case, there would probably be scripts that detail how such reasoning typically unfolds.

Thus, with zombie scripts, the imagination generator can supply some details, like zombie worlds, which mightn't be inferable from the combination of the imagination premise and my unfiltered-beliefs. But it might be said that since 'philosophical modality' is supposed to capture the kind of modality that occurs in philosophical argumentations and scientific theorisations, that talk about zombies makes this described psychological account too one-sided; i.e., it only accommodates the usage of modality in philosophical argumentations, leaving out the usage of modality in scientific theorisations. It might also be added that we can't tell with zombie-talk, whether imagination delivers the *correct* modal judgment in philosophical modalising. I will postpone this second challenge until section (3.2.2) when I discuss how to psychologise imagination-training. The first challenge—that zombie-talk makes this psychological account too one-sided—can easily be resolved, if we use a more familiar and less controversial example that is used for sophisticated theorisation by both philosophers and scientists. For instance, Galileo's falling body thought experiment.

Against the Aristotelian idea that objects fall in proportion to their weight, Galileo asked what would happen if we tie a heavy and a light object together and released them from a height. To see that the prior Aristotelian commitments we began this thought experiment with are problematic, we need only to retrieve abstract representations of objects with different weights, and, in a sense, run the relevant script. Of course, due to some sophistication that would be required at this level; for instance, understanding not just some aspects of Aristotelian physics but also the rules of the thought experiment, the relevant script would be a thought-experiment script. We are supposing that those who have such sophistication engage in thought experimentation often, and, so, they have a script for it. This, then, is how the imaginative act would proceed: It would be kick-started by an initial imagination premise—the Aristotelian commitments; beliefs about those

commitments and nomological laws would then be used as further premises; the imagination generator would then generate some imaginative details, such as, what would happen to the falling objects, which aren't inferable from the involved premises.

As Galileo makes clear, what we end up imagining are scenarios that are paradoxical. Gendler puts it best: "On the one hand, the lighter body should slow down the heavier one while the heavier body speeds up the lighter one, so their combination should fall with a speed that lies between the natural speeds of its components ... On the other hand, since the weight of the two bodies combined is greater than the weight of the heavy body alone, their combination should fall with a natural speed greater than that of the heavy body" (1998: 403). The way out of this paradox, Galileo argues, is to assume that both the heavy and the light objects fall with the same speed. In which case, the prior Aristotelian commitments that we began the imaginative acts with become problematic. And we didn't need to actually tie a heavy and a light objects together to see this; imagining it was enough. What is important for our purposes here is that the same constraints that enabled imagination to deliver correct modal judgments in everyday cases, like in the car and house example I opened section (3.2) with, also enable imagination to deliver correct modal judgments in this sophisticated case. In short, the psychological account of philosophical modality described here helps to explain how this case (and arguably, other cases) of philosophical modality works.

Even though the modal judgment that imagination delivers in this case of Galileo's falling body thought experiment is plausible, the psychological account I have described so far isn't truth-tracking yet. This is the second challenge above—that the zombie-case, and others like it, which are commonplace in philosophical argumentations, are not verifiable in the way that Galileo's falling body thought experiment is. Whether I am necessarily the thing that originated from the gamete I originated from, for example, is surely not verifiable. One way to cash out the verification of this sort of cases is by psychologising imagination-training. For we would have accounted for the disagreements that ensue from philosophers' usage of imagination in philosophical modalising, in which case, we would have explained how it is that an imaginary scenario is true for one philosopher and false for another.

### **3.2.2 Psychologising Imagination-training**

Intuitively, conceptual competence seems to be integral to imagination-training. A computer expert, for example, can give you directions over the phone if you have problems with your computer, supposing that you aren't a computer expert yourself. He can do this because he can *imagine* a whole lot of interventions, which you aren't able to. It follows from this, that what is propositionally imaginable is, *inter alia*, a function of conceptual understanding. Generally,

therefore, someone who has detailed domain-specific knowledge often has a more disciplined and trained imagination in the given area than someone who lacks such knowledge. But how does this integrality of conceptual competence to imagination-training help us psychologise imagination-training? I will work my way up from everyday cases to cases of philosophical modality. For the everyday case, let us work with pretence.

Consider a child that is pretend-talking to his grandma with a banana. His pretend-talk action presupposes that he has already acquired the concept 'telephone'. He wouldn't be able to use a banana as a prop for that specific purpose otherwise. Certainly, he pretend-talks to many people, not just to his grandma. But he need not, each time, occurrently believe that there are some physical similarities between a banana and a telephone whenever he uses a banana as a prop in pretend-talk episodes. His acquisition of 'telephone' introduces some details into his pretence script, which couldn't have been there otherwise. This way, his belief that 'the prop is a banana', informs how a pretence episode in which bananas are used as props for talking will unfold. Further suppose that he later pretend-shoots his brother with a banana. This also presupposes that he has acquired the concept 'gun'. It seems clear that the above psychological explanation will *mutatis mutandis* work in this case also.

His belief that 'the prop is a banana' will also inform how a pretence episode in which bananas are used as props for shooting will unfold. In which case, his pretence script has acquired yet more detail, such that he can now imagine scenarios he wasn't able to before. If so, then there is little doubt that his imagination improves with the acquisition of new concepts. We can easily see how this psychological analysis would work for acquisition of new concepts whose referents have some similarities with a banana. Such concepts will introduce more detail to his pretence script, which will in turn enable him to imagine what he couldn't imagine before. This analysis will also work for other props that the boy may use in a pretence episode. If, for example, he also pretend-stabs his brother with a stick, then such behaviour presupposes that he has acquired the concept 'knife', which introduces some details into his pretence script, which in turn will enable him to imagine what was until then unimaginable for him. This, then, means that imagination-training, to a first approximation, is imagination with more detail. But there is more to the story.

Generally, there seems to be less emphasis on truth in pretence. For instance, the child may also pretend as though the banana is an airplane, even though there are minimal similarities between a banana and an airplane. And other children he is playing with wouldn't say, "No, you can't do that". Whether or not we take this downplaying of truth to be a consequence of the nature of pretence, it seems uncontroversial that in most other usage of imagination, we aim for truth.

Consider again, our computer expert. Suppose his interventions didn't work. You called another expert and relayed what the previous one told you. The new one can say "No, he shouldn't have told you that". Likewise, someone who has domain-specific knowledge about Middle-earth can say, "No, hobbits aren't immortal". How, then, should we psychologise this truth-tracking capability of imagination? One straightforward way is by accounting for how these sorts of disagreement aren't vacuous or trivial. The relevant question then is this: How does disagreement about imaginability help us psychologise imagination-training?

Disagreements about imaginability seem to imply that imaginability is relative to context. A physicist, for example, might be able to imagine the existence of the Higgs Boson in a 10-dimensional plane, and I might not. In matters of theoretical physics, she has more trained imagination than me. But since I might be able to imagine the possibility of zombies and she might not, I have a more trained imagination than her in matters of modal philosophy. (It is fitting that we return to cases like the zombie-example here, precisely because we want to address the challenge that such cases aren't verifiable in the way that the computer-expert case is.) Imaginability is relative to context. But this relativity isn't just inter-context; it is also intra-context. Philosophers of modality are manifestly at odds with one another about what is imaginable and what isn't. A psychological explanation of what is going on when they so disagree might explain the truth-tracking capability of imagination. Consider this familiar case of philosophical modality to make this clear.

Hume (1739) argues that inductive inferences can't be justified, since it is based on an assumption that the future will always resemble the past. Goodman (1954) adjoins that not only can we not answer Hume's problem of induction, but that we need not answer it. Subsequently, disagreements about whether we can answer both the old (Hume's) and the new (Goodman's) riddles of induction have been surfacing in the literature. For instance, one way the riddles have been approached is by arguing that we can or cannot imagine a world where induction faces no problem whatsoever (e.g., Quine 1969; Hacking 1994). What this achieves is that if such a world is imaginable, then the riddles dissolve; if not, then they stand. What is important for us is that the reasons given for why this world is imaginable or unimaginable help us connect the integrality of conceptual understanding to disagreements about imaginability like this one. In which case, the psychological account described earlier in this section with pretence applies *mutatis mutandis*.

The reason given for why we can't imagine a world where induction faces no problems whatsoever is that some problems come associated with our definition of 'induction' (Hacking 1994). Likewise, for why we can imagine such a world: no problems come associated with our definition of

‘induction’ (Quine 1969). This, then, seems to strike at what is really at stake when philosophers quibble about the imaginability of a scenario. They have built some (usually, different) theoretical contents into the relevant concepts (‘induction’ in this case), and, so, there is semantic mismatch. Stalnaker puts it this way:

I said that Dave and Patricia disagree with Sydney about whether zombies are possible, but what sort of disagreement is this? ... The question is not whether a certain conceivable situation is metaphysically possible; it is whether a certain situation that is agreed to be metaphysically possible is correctly described in a certain way ... it seems clear that Dave and Patricia are building some theoretical content into the concept of phenomenal consciousness and the cluster of related words ... Sydney uses the word ‘consciousness’ in a contrasting way, but a way that may also be theoretically loaded (2002: 387, 389, 393–4).

What is relevant about semantic disagreements of this sort is that the same concepts can have different *theoretical* contents (or if you are Fregean about concepts, then, say, “different theoretical interpretations can apply to the same concepts”). For instance, as we saw, Sydney disagrees with Dave and Patricia about the possibility of zombies, because both parties build different theoretical contents into ‘consciousness’. In which case, ‘consciousness’, by being differently theoretically loaded for them, activates their zombie scripts differently, and the differently activated zombie scripts guide the unfolding of different imaginative contents. For Dave and Patricia, the possibility of zombies, and, for Sydney, their impossibility. Otherwise put, since scripts are activated by concepts (Schank and Abelson 1977: 38), and since the relevant concepts, e.g., ‘consciousness’ or ‘induction’, are theoretically loaded in different ways, then, even though both parties are running the same (zombie or induction) script, the script will be activated in different ways.

The merit of this sort of analysis is that it doesn’t assume that the disagreeing party has a less trained imagination than the countenancing party. After all, if Sydney, Dave, and Patricia are Sydney Shoemaker, Dave Chalmers, and Patricia Churchland, respectively, then, presumably, they are all equally conceptually competent in matters of consciousness. Likewise, Ian Hacking and Quine are, presumably, equally conceptually competent in matters of induction, even though they disagree about the imaginability of a world where induction doesn’t face any sort of problems. To a second approximation, therefore, imagination-training isn’t just imagination with more detail; it could also be imagination with less detail. You could know too much and as a result of this, the imaginability of a scenario might become impossible for you. And this ought to count as

imagination-training too. Thus, within contexts where the imaginers come to the table with theoretical baggage, imagination-training isn't just a matter of imagination with more detail; it could also be a matter of imagination with less detail.

This sort of psychological analysis takes emphasis away from consistency and error, and this isn't entirely unintended. Hacking may be wrong, and Quine correct, or vice-versa. Deciding who is correct or wrong in cases like this is an unrealisable task. But the matter isn't all gloom and doom. What is certain is that each party will insist that the other is wrong—that's one reason they disagree in the first place. That is, each will insist that the content of the other's imagination is inconsistent with the fact. But this doesn't mean that such inconsistent imaginative content is vacuous. As Berto and Jago put it: "Imagining an inconsistent scenario does not trivialise our act of imagination" (2018: 154). One advantage of this is that it permits the imagination of impossible scenarios (Priest 1987), and here, also, we can still talk about imagination-training. The point here is that the best we can do is relativise imaginative error to imaginers.<sup>5</sup> But this isn't really problematic, since error can also be characterised *epistemically*; i.e., in terms of what is true throughout all the ways things could be for an agent (Hintikka 1962; Dretske 1981). In short, even though imaginative error can't be characterised veridically, it can be characterised epistemically.

One way this has been achieved is in the construction of a logic for imagination (e.g. Berto 2017; Wansing 2017), one that is epistemic at its core. In clear terms, the logic of imagination is an epistemic logic; i.e., a logical system that builds on what is true throughout all the ways things could be for an epistemic agent. This way, even if error is relativised to the imager, she can err in how she imagines a certain scenario, because she is being judged for consistency based on her own epistemic possibilities. Let us connect this with the challenge that we can't tell whether imagination can deliver correct modal judgments with cases like the zombie example. Given what I have said about the psychology of imagination-training, it is clear that this challenge doesn't hold much weight. Zombie-talk can be true and false insofar as the relevant context is taken seriously, and importantly, imagination can deliver such truth or falsity. (I will say more about this in section (3.3.1).)

Moreover, even though this psychological account of philosophical modality downplays the objectivity of imaginative error, there is no problem for my target account of imaginative modal justification. Here is how. Suppose I am Quinean about the problem of induction, and I believe

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<sup>5</sup> Some theorists (e.g., Pelletier et al. 2008) have taken this relativity to be fatal to any account that prioritises cognitive architecture. Error, they argue, shouldn't be a relative concept; there should be some sort of objectivity to it, or else, there is no error to begin with. I will respond to this line of thought in section (4.2.3).

as a result that ‘inductive inference can be justified’. I might be justified in so believing. If so, then an account of imaginative modal justification that’s worth its salt should account for cases like this as well. To reiterate, my goal is not to carve imagination at its ontological or logical joints, but merely to lay out the psychological process involved when we philosophically modalise (sections 1.1 and 1.3).

At any rate, situating scripts as the psychological loci of imagination-training bears some fruit. First, it fits the cognitive-architectural picture I have been describing so far. Scripts were already pivotal in the described architecture of imagination—featuring in the etiology of non-inferable details in our imagination episodes—such that centralising them now in imagination-training aligns with that pivotal role. Second, situating scripts as the psychological loci of imagination-training sustains the centrality of language to propositional imagination. It seems standard that propositional imagination has much to do with language, and since concepts and scripts are linguistic in nature, and central to psychologising imagination-training, then this intuition about the centrality of language to propositional imagination is sustained.<sup>6</sup>

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<sup>6</sup> This gives one reason why I follow Nichols and Stich’s account of the architecture of imagination as against Carruthers’ (fn. 3). For even though language is associated with propositional imagination, it seems clear that what language causes are propositions. Carruthers himself says as much: “On my account, language serves to introduce some propositional contents into the cognitive system for the very first time, and in a way that would not have been possible otherwise” (2006: 310–1). Thus, a natural question arises: Since imagining is not the only propositional attitude (there is also believing and desiring), how then does our mind individuate which attitude to attach to a newly formed proposition? Carruthers doesn’t say. An answer can be teased out from what I said above. But we would have to add some constraints to Nichols and Stich’s account first.

Nichols and Stich tell us that the imagination generator generates both propositional and experiential imaginings. But they leave us short with regards to how it does so. What I see as their shortcoming is that language isn’t given its due place in their account. But my argument above, which centralises language in the architecture of imagination, can easily rectify this. For we can now say that language systems are connected to the imagination generator; hence, the integrality of scripts and concepts to propositional imaginings. This way, when we consciously imagine, as it is typical of PM-reasoning, language systems trigger the imagination generator to generate an initial imagination premise. The implication of this, of course, will be that perceptual systems are also connected to the imagination generator, such that how the imagination generator generates experiential imaginings can also be explained. But this shouldn’t be problematic.

With this embellishment, we can address the challenge that Carruthers’ account faces. Recall that the challenge is that his account fails to explain how the mind individuates which attitude to attach to a newly formed proposition. But now, we can extrapolate from the connection between language systems and the imagination generator, to connections between language systems and both belief- and desire-generating systems. With connections between language systems and systems that generate propositional states, how the mind attaches mental attitude to propositions is explained. Of course, this would require analogous connections between perceptual systems and systems that generate our propositional states, and this, again, shouldn’t be problematic.

But if I am right about these different connections, then it just means that experiential and propositional imagination do not come for free, as Carruthers says. Connections, extending from perceptual and language systems to some other systems are required to generate both experiential and propositional imaginings. And where there are connections

If this psychological account of philosophical modality is coherent, then we are one step away from constructing an account of imaginative modal justification for PM-beliefs from it. But the described architecture, in its current state, can't get us that far. It isn't yet clear whether the architecture can accommodate the formation of PM-beliefs, and this is because the system we have been able to construct with it, is merely *imagining*-generating, and what we need is a *belief*-generating system. To talk about justification, we need beliefs. In the next section, I give one way we can bolster the architecture of imagination to become belief-generating.

### 3.2.3 Psychologising Philosophical Modal Beliefs

We form beliefs about our propositional states all the time in a process that can be labelled 'reading one's own mind'. For most accounts of mindreading (e.g., Sellars 1956; Gopnik and Meltzoff 1994; Carruthers 2006), the mechanism that subserves this process of reading one's own mind—the Theory of Mind mechanism—is the same one that subserves the process of reading other people's minds. This is because the information that we are certain of, is that which pertains to our perception and awareness of other people, such that the mechanism we have, uncontroversially, is the one that utilises this other-centred information about minds. But Nichols and Stich (2003) think we have a separate mechanism for reading our own minds. They think that even though we uncontroversially have this other-centred information about minds, there is evidence that we also have self-centred information about minds. For instance, although young children have no trouble detecting and reporting their own pretences (see, Leslie 1994), they seem to be significantly worse at recognising pretence in others (see, Rosen et al. 1997).

Consequently, they postulate a separate mechanism that utilises this self-centred information about minds.<sup>7</sup> They call it the *Monitoring Mechanism*. They explain that, given how self-awareness works, the monitoring mechanism would work swiftly: "To produce representations of one's own beliefs, the Monitoring Mechanism merely has to copy representations from the Belief Box, embed the copies in a representation schema of the form: *I believe that* \_\_\_\_, and then place the new representations back in the Belief Box" (Nichols and Stich 2003: 161). In fact, as they tell the story,

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among systems, there is a larger system that's an ensemble of those smaller systems. In this case, we may call such larger systems, the *imagination system*. See fn. 12 for why having an imagination system pays dividends for our purposes, and fn. 19 for an additional reason why Nichols and Stich's position is more congenial to our purposes.

<sup>7</sup> Carruthers, for example, thinks that this proliferation of mechanisms is bad for business. He argues that all that's needed to have representations of our propositional states is that they "be taken as input by the language faculty and encoded into a suitable linguistic format" (2006: 178). This meshes with his idea that we require no separate systems to imagine (see fns. 3 and 6, above). For, if it is true that propositional imagination comes to us for free with language, then language must have the required resources to accommodate self-awareness about our imaginings. In his view, it does. Since theories about the psychology of imagination are significantly speculative (section 3.2), disagreements like this are common.



there could be more than one Monitoring Mechanism: “The proposed mechanism (or perhaps a distinct but entirely parallel mechanism) would work in much the same way to produce representations of one’s own desires, intentions, and *imaginings*” (Nichols and Stich 2003: 161, my italics). I take them seriously, and, so, I further postulate that we have an *Imagining-monitoring Mechanism* (IMM), for forming beliefs about our imaginings.

Readers who are familiar with Nichols and Stich on this matter may query whether the IMM can do the job I want it to do, because, according to Nichols and Stich, the IMM would only be able to facilitate *awareness of not reasoning about* one’s imaginings. This is because Nichols and Stich argue that reasoning about one’s mental state remains the job of the Theory of Mind mechanism. But I don’t need the IMM to be reasoning facilitative at all. This is because I take it that forming philosophical modal, and *a fortiori* imaginative, beliefs isn’t just a psychological task, but also an epistemic one<sup>8</sup>, especially because forming imaginative beliefs requires conscious effort on our part. Thus, while there should be a module that takes imaginings as input and outputs beliefs about them, believing imaginings isn’t just the task of that module. In short, the formation of imaginative beliefs occurs at the personal level. (I will say more about this shortly, in section (3.3.1).) This isn’t the case with perception, where the formation of perceptual beliefs can occur at the sub-personal level (section 2.2.2).

Like its counterpart(s), the IMM would also work swiftly; it would take representations from the imagination box, insert them in a representation schema of the form: *I believe that* \_\_\_\_\_, and then output the new representations into the belief box.<sup>9</sup> But the IMM would be different from its counterpart in important and interesting ways. I will give three such ways, which will also double as reasons why I think it is more plausible to say we have a different mechanism for imaginings.

Firstly, unlike its counterpart, I think the IMM would be introspectively transparent. This is because believing and imagining are quite distinct propositional attitudes; so distinct, that their dissimilarities have been the source of puzzles for philosophers (e.g., Gendler 2000; Nichols

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<sup>8</sup> Consider mindreading. If I want to utilise an imagining in a mindreading task, I need only to be able to retrieve it; its epistemic properties aren’t relevant for the mindreading task. But, if I want to utilise it in a modalising episode, then I must do more than just retrieve it; I must also preserve its epistemic properties. In short, while it doesn’t matter whether or not the imagining is true in the mindreading case, it matters in the modalising case.

<sup>9</sup> Readers who are familiar with Nichols and Stich on this matter shouldn’t take the IMM as parallel with Nichols and Stich’s *Percept-monitoring Mechanism* (PMM). The PMM, in their view, is different from the Monitoring Mechanism (MM), since perceptual states seem not to be propositional, and the MM, as they explain it, takes care of propositional states only. Imaginative states are undoubtedly propositional states, and, so, the IMM is a counterpart of the MM and not the PMM. So, when I talk about the counterpart of the IMM in this section, I mean the mechanisms parallel to the MM not the PMM, which works for other propositional states.

2006b; Schellenberg 2013). As I have earlier mentioned, one can simultaneously believe that  $P$  and imagine that  $\sim P$ , such that to form beliefs about our imaginings would require conscious effort. Thus, even though the operation of the IMM is swift, there is little chance that it would be unconscious.<sup>10</sup> Consider pretence to make this clear. Children don't typically believe the contents of their pretence episodes. For instance, the child that pretend-shoots his brother with a banana doesn't believe he is actually shooting his brother. He certainly doesn't want his brother to die! (This phenomenon is called 'cognitive quarantine'.) To believe that he is actually shooting his brother with a banana, then, would require active and conscious effort on his part.

Secondly, while it is unclear whether the IMM's counterpart is encapsulated (Nichols and Stich don't say, and it is difficult to conclude given what they do say), it seems clear that the IMM isn't encapsulated. Encapsulation, we would recall (section 1.5), means that the operation of a module is isolated from the rest of cognition, and that other modules can't have access to it. But since "imagination, in the relevant sense, *is more than mere supposition* of a content,  $A$ " (Berto and Jago 2018: 150, my italics); i.e., a form of reasoning, any other reasoning systems, like hypothetical, counterfactual, and practical reasoning systems, would have access to the IMM. Reasoning is collegial. This, in part, is why logicians think imagination should have its own logic: any form of reasoning can be given its own logical rules and systems. We can say then, that the IMM's operations become more complex as these other systems get activated later in life, both phylogenetically and ontogenetically. Complex enough, I suggest, to handle PM-imaginings.

One implication of the IMM's lack of encapsulation is that we are consciously aware of the interlevel representations of the interactions between the IMM and these other systems, whether or not the representations are doxastic. Here is how. Imaginative acts, within PM-reasoning, aren't run offline but online. We know this because, as I have stressed, in the relevant sense, imagination is conscious. (I will say more about this shortly, in section (3.3.1).) Now, suppose that during this conscious exercise, I reasoned using an initial imagination premise together with the whole of my pre-existing beliefs (section 3.2.1), to a certain imaginative conclusion. It seems clear that I would believe each of the steps in that imaginative reasoning process. This shouldn't be controversial.

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<sup>10</sup> There seems to be no reason to think analogous mechanisms for belief and desire would be introspectively non-opaque. For instance, following what Nichols and Stich say about the Monitoring Mechanism, it seems its operations would be swift and typically unconscious. This means that one needn't be consciously aware of one's beliefs before one can form beliefs about those beliefs. *Mutatis mutandis* for desires. We have many beliefs about our desires even when we aren't consciously aware of those desires. (This is Carruthers' (2006) reason for rejecting Nichols and Stich's proliferative strategy (see fn. 7, above).) But, as I have argued above, this seems not to be the case for our imaginings. Conscious effort is required to form imaginative beliefs.

For example, each step in a process of deductive reasoning is already believed, or an implication from what is already believed (Evans and Over 2012). It seems farfetched that a proposition I don't believe might be a premise in a reasoning process. Thus, thirdly, the IMM must also be inferentially transparent, in Lyons' (2009) terminology.<sup>11</sup>

These three reasons, I take it, are sufficient to serve as motivations for postulating the IMM. With the IMM, the architecture of imagination doesn't only accommodate philosophical modality, it also accommodates the formation of PM-beliefs. The IMM, as depicted in fig. 3.2, enables the architecture of imagination to become a belief-generating system, and not merely an imagining-generating system. Call any such resultant belief-forming system, an *imagination system*. With the imagination system, we can begin justification-talk since we are now equipped to talk in terms of a cognitive system that outputs PM-beliefs.<sup>12</sup> In the next section, I defend an account of imaginative modal justification.

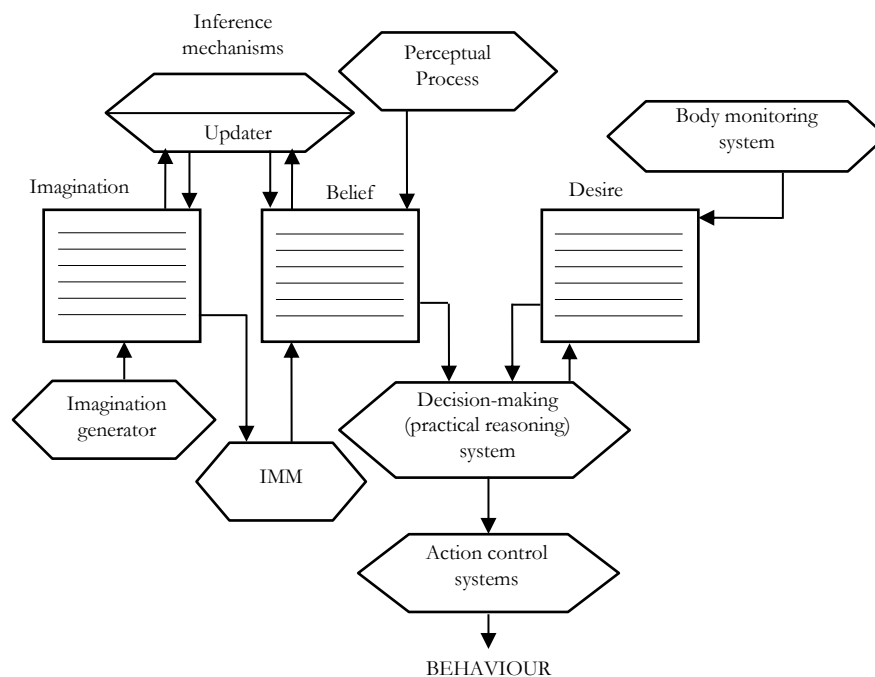


Fig. 3.2 The architecture of imagination with the IMM

<sup>11</sup> See section (2.2.2) for more about inferential opacity.

<sup>12</sup> This is the promised reason why Nichols and Stich's position in the debate about the architecture of imagination pays dividends for our purposes. To psychologise imaginative modal justification, we must be able to speak in terms of a cognitive system that output PM-beliefs, and Nichols and Stich's account affords this.

### 3.3 Imaginative Modal Justification: Conditional Reliability

I have said that my theoretical framework in this dissertation is process reliabilism (section 1.4). But there seem to be two approaches to process reliabilism: *belief-first* and *process-first* approaches. A belief-first approach focuses on the conditions the *beliefs* that are produced by a process must meet for them to be justified. A process-first approach focuses on the conditions a *process* must meet for the beliefs it produces to be justified. Vogel seems to have this kind of distinction in mind here: “one can distinguish between ‘reliable belief’ accounts of knowledge from ‘reliable process’ accounts. Roughly, according to the former, whether you know that *P* depends upon whether your *belief* that *P* is prone to error. According to the latter, whether you know that *P* depends upon whether the *process* that produced your belief that *P* is prone to error” (2000: 602, original italics).

The account of perceptual modal justification account I defended in Chapter 2 is a belief-first approach to process reliabilism. I worked my way to the account by arguing that BM-beliefs meet the conditions for basicity, and, so, they are *prima facie* justified. It seems to me that this strategy won’t work for an account of imaginative modal justification that’s the target here. The challenge is that, if we take a belief-first approach, the result would conflict with our intuition about the reliability of imagination. Firstly, what is our intuition about the reliability of imagination? It is that imagination isn’t as reliable as perception, but, at the same time, that imagination isn’t as unreliable as wishful thinking; it is somewhere in between. I take it that this intuition isn’t just strong, but also correct. Even though imagination can be regulated (section 3.2.2), it is, *ab initio*, a speculative mental state, such that, however we cash out its reliability, it will fall short of being as reliable as perception is.

Secondly, what would be the result of taking a belief-first approach in defending an account of imaginative modal justification? Imagination is a belief-dependent process; i.e., it is part of its normal operations to take beliefs as inputs. Recall that, during imaginative processes, the entire content of the belief box is put into the imagination box (section 3.2.1). But even though imagination is a belief-dependent process, it seems to be functionally similar to memory. In section (2.4.1), I explained that inputs into memory systems are diachronic not synchronic. That is, input-beliefs into memory systems are old and non-occurrent. Similarly, for imagination systems. When the contents of the belief box are put into the imagination box during imaginative processes, the

input-beliefs are not current ones; they are old and non-occurrent.<sup>13</sup> (I will return to this synchronic-diachronic distinction in section (3.3.2).) Since, for any belief to be relevant to an inference, “it needs to be tokened at the time of the inference” (Lyons 2009: 172), input-beliefs into imagination systems won’t be relevant to the inference involved in imaginative processes. In which case, the output imaginative beliefs will be non-inferential or basic, and, so, *prima facie* justified.

But this conflicts with our intuition about imagination as stated above—that imagination isn’t as reliable as perception but not as unreliable as wishful thinking. One reason is that perception can give *prima facie* justification because, unlike imagination, it isn’t a reasoning process. Perception has this in common with other processes that have been defended to give *prima facie* justification: memory, testimony, and introspection (Lyons 2009). But imagination in the relevant sense, is a reasoning process, and, so, the thought that it gives *prima facie* justification becomes somewhat unsettling. Hence, I said in section (3.1) that I won’t speak in terms of *prima facie* justification in this chapter. Intuitively, no one is *prima facie* justified in believing that ‘zombies are possible’. Beliefs such as these seem very inferential.<sup>14</sup> As Lyons puts it: “If you want to know whether four-dimensionalism is true ... you will have to engage in some *inference*” (2009: 122–3, my italics). Four-dimensionalism is a metaphysical position about persistence (e.g., Sider 2001); so, a belief about it would be a typical PM-belief, and, as we have seen, it would be an inferential non-basic belief. In which case, it should be *prima facie* unjustified.

Yet, if we take a belief-first approach, the inevitable result is that imaginative beliefs are non-inferential and basic, and, so, *prima facie* justified. A reliabilist account of imaginative modal justification must, therefore, proceed without contravening this strong and correct intuition about imagination. A process-first approach seems to offer a way out of this dilemma. As I have explained, a process-first approach focuses on the conditions a process must meet for the beliefs it produces to be justified. If we take this approach in defending imaginative modal justification, we would be able to stay true to our intuition about imagination, which we would have contravened had we taken a belief-first approach. This is because, as we have seen (section 3.2.3), when imagination is used for PM-reasoning and for other epistemological work, it is a form of reasoning.

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<sup>13</sup> Perhaps not all input-beliefs into imagination systems are non-occurrent, it might be said. Fair enough, but as I will make clear shortly (section 3.3.2), the occurrent input-beliefs into imagination systems are epistemically insignificant.

<sup>14</sup> It might be objected that not all PM-beliefs lack *prima facie* justification; that we are *prima facie* justified in believing a mathematical necessity; for example, that ‘ $2+2\neq 5$ ’. This is true. But since we are working within process reliabilism, we should focus on the system that is outputting the PM-belief. When we are *prima facie* justified about any PM-beliefs, especially those of mathematical necessity, I think the beliefs aren’t output by the imagination system. Rather, they are output by a memory system. See fn. 22, below.

But, if imagination, when used for PM-reasoning, is a form of reasoning, and, if as Lyons makes clear, “any reasoning process would base its outputs on the premises it takes as inputs” (2009: 140), then it follows that the imagination system will output PM-beliefs as inferential and non-basic, and, so, *prima facie* unjustified. In this way, our intuition about imagination isn’t contravened.

But taking a process-first approach seems to require that the process in question be already on the list of processes we count as reliable, at least in the actual world (Goldman 1992a). Intuitively, wishful thinking, for example, isn’t on this list, but perception and testimony, for example, certainly are. Is imagination on the list? I think so. The literature on the philosophy of imagination seems to suggest as much. There are accounts of the usefulness of imagination in decision-making (e.g., Nanay 2016), fiction (e.g., Moran 1994), aesthetics (e.g., Sheppard 1991), and religious beliefs (e.g., Pouivet 2002); as a guider of action (e.g., Funkhouser and Spaulding 2009); as our epistemic access to modality (e.g., Chalmers 2002). These accounts suggest that imagination has some epistemic and pragmatic relevance, and this relevance in turn suggests that we think imagination is, to some extent, a reliable process. This is supported by the fact that even though imagination is very speculative, it is also regulatable (section 3.2.2). But if imagination can be regulated, and since some regulation of a process is an indication of the process’s reliability (section 1.5), then imagination is reliable to some extent. But to what extent exactly. We have already seen that imagination isn’t as reliable as perception is. But how should we characterise its reliability? An understanding of the reliability of perception would point us in the right direction.

The reliability of perception seems to be intrinsic, in that perception doesn’t depend on its inputs to be true for it to be reliable (e.g., Burge 2003). This is why a hallucinated subject would believe their perceptual experience—the reliability of their perceptual process subsists even though the perceptual inputs are false. Whereas, the reliability of imagination seems to be extrinsic, in that imagination depends on its inputs to be true for it to be reliable. If I falsely believe that cows have purple pigmentation, for example, and, so, I imagine that ‘purple cows are possible’, it seems my imagination is unreliable in this case. This is because given what we know about the pigmentation of skin colour, many things about cows’ anatomy would have to change for them to have purple pigmentation (Van Inwagen 1998). Certainly, imagination under-determines its contents, such that I may simply imagine purple pigmentation for cows without imagining any other details about them. But this seems to say something about the nature of imagination and nothing about its reliability. Consider that if it turns out to be true that cows can have purple pigmentation, our intuitions about the reliability of my imagination then, would be different from when it is false that

cows can have purple pigmentation—it won’t be under any scrutiny. This seems to suggest that the reliability of imagination is, in some ways, a function of the truthfulness of its input-beliefs.

In short, imagination, when construed as a reasoning process, is only as good as its input-beliefs. This is corroborated by Goldman’s clarification that the appropriate notion of reliability for any reasoning process is a notion of *conditional reliability*, where “a process is conditionally reliable when a sufficient proportion of its output-beliefs are true *given that its input-beliefs are true*” (1979: 98, original italics). Given this notion of reliability that captures the reliability of the imagination system, let us define a simple reliabilist thesis for our account of imaginative modal justification as follows:

IMJ\*\*\*<sup>15</sup>: a PM-belief is justified if it is the output of a conditionally reliable imagination system.

My task, then, is to explain just when the imagination system is conditionally reliable. For, if the conditions are met, then the PM-beliefs, which are output by the imagination system, will be justified. I will say the imagination system is conditionally reliable when its (i) constitutive inference is justified, and (ii) input-beliefs are justified. It will help if we think of (i) as a condition *for* the reliability of the imagination system, and (ii) as a condition that *sustains* this reliability; i.e., (ii) builds on (i). What we shouldn’t do, however, is think of them as conditions for the justification of PM-beliefs; that would mean we were taking a belief-first approach. To reiterate: We are taking a process-first approach, and, so, (i) and (ii) are conditions for the reliability of the imagination system, such that, when they are met, the output-beliefs of the system can in turn be justified. I will defend (i) in section (3.3.1), and (ii) in section (3.3.2).

### 3.3.1 The Reliability of Imagination

I have argued (section 3.3) that we think imagination is a reliable process in the actual world. But I didn’t discuss what conditions make a process reliable in the actual world. Goldman gives one condition: for any process to be reliable, it must have “the tendency to produce beliefs that are true rather than false” (1979: 95). This straightforwardly shows why we take perception as reliable, and wishful thinking as unreliable. Perception is reliable because it tends to produce true beliefs rather than false ones, and wishful thinking isn’t reliable because it tends to produce false beliefs rather than true ones. Using this condition then, we can ascertain whether imagination rightly deserves to be on the list of reliable process in the actual world. The relevant question then

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<sup>15</sup> As I did in Chapter 2, I will keep reducing the stars as I refine this formulation until I get to the target formulation that has none.

becomes: Does imagination produce true beliefs rather than false ones? Does imagination even have the capacity for truth? I think it does. I have mentioned one way earlier (section 3.2.2). I said that imagination can be true in an epistemic sense. I will defend this position here. To do this, let us distinguish between two senses of intentionality: *psychological* and *epistemic* intentionality (Searle 1979).<sup>16</sup>

Psychological intentionality is the sense of aboutness. Many of our mental states are about something; i.e., they refer to something in the world. This seems to be a fact about them, in that the fact that our mental states are about something isn't at the mercy of the individual. Consider perceptual states. Whether you like it or not, your perceptual states are about something in the world. So too are desire states, hoping states, fearing states, suspecting states, decision-making states, imaginative states, and so on. It seems to be part of the internal working of the modules/systems that output mental states to output them as being about something. This is what the psychological sense of intentionality captures. Under this sense, imagination seems to be triggered or run off-line. By off-line here, it is meant that imaginative states are about something, but we didn't *mean* or *intend* to imagine. Here are some examples to make this clear. If you *desire* to be wealthy, your imagination will be triggered as to what you would use the money for. If I *fear* or *suspect* that my spouse is cheating, I will perforce be induced to visualise my spouse in bed with someone else. If I want to decide between two things, my imagination would be triggered as to which of the things has the most favourable outcome. In short, under the psychological sense of intentionality, imaginative states come as part of other mental states. Here, imagining is just a function of our cognitive systems.

This, then, isn't the relevant sense of imagination that is useful for PM-reasoning and to other epistemological work. For, under the relevant sense, as we have seen, imagination requires conscious effort on the part of the imaginer (section 3.2.3). In the relevant sense, then, imagination isn't just a function of our cognitive systems, it is also something the individual does. Here, imagination seems to run on-line: imagination is about something and we *meant* or *intended* to imagine; for instance, when a writer tries to create fiction, or when you are asked to entertain the possibility of flying pigs. Simply, under the relevant sense, imagination isn't just psychologically

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<sup>16</sup> Searle calls the psychological and epistemic senses, the technical and non-technical senses of intentionality, respectively. The psychological sense is technical because it is the sense in which philosophers speak of intentional state; i.e., states that are about something. The epistemic sense is non-technical because it is just one of our intentional states, i.e., intending is an intentional state. I speak in terms of 'psychological' and 'epistemic' here because I want to appropriate what Searle says in a psychological context, such that it makes sense to speak about intentionality at the level of modules/systems, and at the level of the individual.



intentional, it is also epistemically intentional. Here after, I will say that when imagination is used for PM-reasoning, it is epistemically intentional.

The ‘epistemic’ in epistemic intentionality is not completely theoretically innocent. It is designed to capture the sense in which non-factive intentional states, like belief, desire, hope, and imagining, are said to be true, even though their truth can’t be verified by anything in the external world. (Perceptual states, for example, are factive.) The way this has been done, is by characterising truth in terms of what is true throughout all the ways things could be, for all that the agent in question knows (Hintikka 1962; Dretske 1981). That is, non-factive intentional states can be true given the epistemic possibilities of an epistemic agent. This notion of truth is at the core of contemporary epistemic and doxastic logics (e.g., Blackburn et al. 2002), which has proven useful in recent times in the construction of a logic for imagination (e.g., Berto 2017; Wansing 2017). As I have explained (section 3.2.2), one of the advantages of this logic of imagination is that it helps to explain imaginative error. An imaginative act could be erroneous even though the error is relativised to the imaginer. Perhaps it would be helpful to dwell on one way the logic of imagination helps to realise imaginative error. One way an imaginer can err is if their imaginative act violates the principles of simplification and adjunction (Berto and Jago 2018).

According to Berto and Jago, imagining a conjunction implies that one imagines both conjuncts individually (simplification), and imagining two conjuncts implies that one imagines the conjunction of both conjuncts (adjunction). But simplification and adjunction are sound if and only if both conjuncts are from the same context, such that an imaginative act that violates them becomes defective. If you and I are reasoning about zombies, and we are using words like ‘consciousness’ in some physicalist sense, then my imagination that ‘zombies can feel pain’ will come out defective. Pain can be felt if consciousness is defined in physicalist terms, whereas, zombies are only possible if consciousness isn’t defined in physicalist terms. Bringing these two together is indicative of a contextual shift. I am oscillating between a physicalist sense where pain can be felt, and a non-physicalist sense in which zombies are possible, and imagination ought to respect the relevant context. (This corroborates what I said earlier (section 3.2.2) about disagreements like this—that much about them turns on semantic mismatch.) Imaginative acts that violate simplification and adjunction shouldn’t follow from what we imagine by way of “automatic logical entailment” (Berto and Jago 2018: 150).

The point of this is that, even though imagination is speculative, it works to fix what is true for an agent: “the role of the world *w* where the act of imagination takes place is to fix the agent’s beliefs, rather than to fix what is in fact the case” (Berto and Jago 2018: 155). This explains why my

imagination is defective when I shifted the context of the imaginative act in the above example: it fails to fix my belief. What I should have believed, given our agreement, is that ‘consciousness is defined in some physicalist terms’, which would have been true for me, but I ended up believing that ‘consciousness is defined in some non-physicalist terms’, which wasn’t. It follows, then, that when imagination does fix my beliefs; i.e., when it enables me to believe what is true given my epistemic possibilities, it is reliable. Thus, even though imagination is non-factive in that nothing in the external world can serve as a verifier for it, the imaginer’s beliefs can serve as such verifiers. It isn’t just for cosmetics that imagination when used for PM-reasoning is as good as its input-beliefs.

Let us define this belief-fixing role that imagination plays in PM-reasoning into what the ‘epistemic’ in epistemic intentionality means, so that we can say an imaginative act is epistemically intentional when it aids the generation of a belief that is true given the epistemic possibilities of the agent. Thus, we can specify the conditional reliability of imagination systems by defining epistemic intentionality, so construed, into it:

IMJ\*\*: a PM-belief is justified if the imagination system that outputs it is epistemically intentional.

We should remind ourselves what IMJ\*\* achieves. It gives a condition for the reliability of the imagination system. Particularly, it defines just when the imagination system is reliable, such that when it is met and the imagination system is, as a result, reliable, the imagination system outputs *justified* PM-beliefs.

But it is possible that the imagination system meets this condition and its reliability still fails to survive the inference that’s constitutive of PM-reasoning, such that its output PM-beliefs become unjustified, or their justification is defeated. For instance, a reliable imagination system may yield an unjustified PM-belief if its input-beliefs aren’t justified. This is because PM-beliefs, as I have made clear (section 3.3), are inferential and non-basic beliefs when they are output by the imagination system, in which case, they are based on input-*beliefs* into the system. Lyons captures this aptly: “I suggest that the reason reliability is not sufficient for the justification of [non-basic] beliefs is that they are nonbasic” (2009: 122). It doesn’t take much thought to see that we’ve got the safety net we need here; viz, if the input-beliefs are themselves justified, the reliability of the outputting imagination system will survive the constitutive inference. In the next section, I will lay out how this works.

### 3.3.2 Justified Input-beliefs

One straightforward way input-beliefs into the imagination system will be justified is if the beliefs are basic. In section (2.3), I explained that basic beliefs are those whose justification do not require evidential support from other beliefs, where ‘evidential support’ means taking the content of the first belief as evidence for the content of the second one. On the assumption that we have many basic beliefs, it follows that when the content of the belief box is put into the imagination box during imaginative processes (section 3.2.1), many of those input-beliefs are basic beliefs.<sup>17</sup> What kinds of beliefs can these be? Following Lyons, I will count “perceptual beliefs, memory beliefs, introspective beliefs, and some—but not all—*a priori* beliefs as basic” (2009: 136). I have spent considerable time on the basicity of perceptual beliefs (section 2.3), so, I will skip such details here. I have mentioned and briefly explained how memory beliefs are basic (sections 2.4.1 and 3.3); I will add to what I said then here. We haven’t encountered the basicity of introspective and *a priori* beliefs, so, I will spend time on them. Let us begin with perceptual beliefs.

Perceptual beliefs are the *de jure* candidates for basic beliefs. In Chapter 2, their basicity aided the defence of my perceptual modal justification account. What follows from this is that many perceptual beliefs are modal in content, such that they will be straightforwardly relevant to what is at stake here—how justified input-beliefs into the imagination system ensures that the system’s reliability survives the involved inference. But this presupposes that perceptual beliefs constitute a large proportion of the input-beliefs into the imagination system during PM-reasoning, which they don’t. Perceptual beliefs are pictorially represented, and PM-reasoning “cannot be purely pictorial, for it involves abstract objects and properties far removed from sensory perception” (Berto and Jago 2018: 38). Hence, it is standardly taken that perception is limited when it comes to PM-reasoning.<sup>18</sup> Thus, the perceptual beliefs that would be allowed into the imagination box by the updater (section 3.2.1) during PM-reasoning, won’t constitute a sufficient number to sustain the reliability of the imagination system. But, of course, they would contribute to such sustenance in the grand scheme of things, however small their contribution may be.

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<sup>17</sup> Of course, many are also non-basic, but we can generalize that if any of these non-basic beliefs are justificatorily salient for the output PM-beliefs, they would need to be justified themselves. I will return to these non-basic beliefs and how they bolster the reliability of the imagination system shortly.

<sup>18</sup> It should be noted that this limitation isn’t suggestive of the epistemic irrelevance of perceptual beliefs in PM-reasoning. In fact, one of the most developed metaphysical accounts of how we imagine philosophical modality (Lewis 1986) seems to give an important place to percepts. One can interpret Lewis’ principle of recombination as suggesting that philosophical modalities are generated from the recombination of *mental imageries*. In short, there is no conflict in saying that perceptual beliefs play some roles in PM-reasoning. What is problematic is to say that perceptual beliefs can carry all of the explanatory burden.

Aphantasia presents empirical evidence that corroborates the above conclusion (or, if you want, it presents evidence that takes the conclusion further in that we can, given aphantasia, deny the idea that perceptual beliefs contribute anything at all in PM-reasoning). Aphantasia is a condition where one cannot voluntarily visualise mental imagery (e.g., Zeman et. al. 2015, 2016). Its causes are not completely known, but damage to the visual cortex has been linked to it (Keogh and Pearson 2017). Most recorded cases of aphantasia are partial; i.e., affecting one or more sense modalities (Zeman 2016). But there are complete cases as well, where all the sense modalities are affected. In such complete cases, the aphantasic lacks experiential imagination completely. But even in those cases, where experiential imagination is lacking, the aphantasic can still propositionally imagine. For instance, a theoretical physicist, who trades in PM-reasoning, details how the lack of mental imagery hasn't impacted his career as a theoretical physicist (Watkins 2018).<sup>19</sup> The lesson from this is that perception may not be as relevant to PM-reasoning as we thought.<sup>20</sup> PM-reasoning would work just fine even if none of its input-beliefs are perceptual beliefs.

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<sup>19</sup> See also Sims (2018).

<sup>20</sup> Aphantasia presents yet another reason why Nichols and Stich's position seems more congenial than Carruthers' in the debate about the architecture of imagination. Although, as I have made clear above, aphantasia shows that propositional imagination doesn't require the cooperation of experiential imagination; it doesn't show that experiential imagination doesn't require the cooperation of propositional imagination. And this asymmetry is easily explainable with Nichols and Stich's position, but not with Carruthers'. I have suggested (fn. 3) that the imagination generator is connected to both perceptual and language systems, such that how it generates experiential and propositional imaginings, respectively, can be explained. With this embellishment, one can simply say that the damage to the visual cortex blocks perceptual systems from triggering (by way of sending input into) the imagination generator. Hence, the lack of experiential imagination in aphantasia. But in normal human adults, both perceptual and language systems continue to trigger the imagination generator, such that the asymmetry between experiential and propositional imagination is explained.

Things are not so clear with Carruthers' position. If, as he claims, imagination has no systems of its own, in that experiential imagination and propositional imagination come for free with perception and language, respectively, then the relevance of propositional imagination to experiential imagination must be explained in terms of a *direct* connection between perception and language. This last part is the problem—the relationship between perception and language seems indirect. The relationship between perception and language is a very grey area in epistemology and cognitive psychology (see, Gallese and Lakoff 2005), and many theorists seem to take an indirect route to illuminate the matter. They explain the interdependence of perception and language through a third system. For instance, Aziz-Zadeh et al. (2006) show this interdependence through action systems, Mitterer et al. (2009) through memory systems, Landau et al. (2010) through face recognition systems, Heurley et al. (2012) through decision-making about colours, to mention but a few. But if we take this implication seriously, i.e., if the connection between perception and language is indirect in that perception and language are only connected as far as some third systems share representations from both of them, then Carruthers' account cannot explain the asymmetry between experiential and propositional imagination. His account relies on a direct connection between perception and language, but, as we have seen, the connection between perception and language may be indirect all the way down.

There might not be direct psychological evidence in favour of Nichols and Stich's account at the expense of Carruthers', but there are certainly indirect ones, as we have seen in fns. 6, 12, and here.

Introspection is a curious case. It is, like memory systems, a belief-dependent system, yet it outputs basic beliefs. But it is unlike memory systems in that it outputs basic beliefs even when input-beliefs into it are synchronic—new and occurrent. (Recall that memory and imagination systems take diachronic inputs—old and non-occurrent.) If I introspect the belief that ‘losing a bet can get emotional’, the output introspective belief will be ‘I believe that I believed that losing a bet can get emotional’, and the first belief will still very much be new and occurrent. In fact, introspective beliefs are only newer than their input-beliefs by a matter of seconds; both introspective beliefs and the input-beliefs they are based on are occurrent. But introspective beliefs aren’t epistemically based on their input-belief. Recall that for a belief to be epistemically based on another, the content of the first must be evidence for the content of the second. And this isn’t the case for introspective beliefs (see section 2.4.1). Consider our example about betting. The input-belief is about betting, while the introspective belief is about my mental attitude regarding betting. Thus, even though introspection systems are belief-dependent and take synchronic inputs, their outputs aren’t inferential; i.e., they are basic.<sup>21</sup>

Generally, introspection is a form of self-awareness, and I doubt that self-knowledge is epistemically useful to modal justification. That you are aware of your belief about the possibility of purple cows has little to do with whether or not the belief is justified. If it does, then zombies, who surely can’t have introspective beliefs since introspection requires consciousness, should lack justified PM-beliefs. But that is just too strong. Most of zombies’ PM-beliefs (and there is no reason to say they can’t form PM-beliefs—if we accept that zombies are possible, then zombies who are philosophically inclined are also possible) would be justified. In which case, the account of imaginative modal justification under construction here should accommodate zombies’ PM-beliefs. But if the above is correct, then introspective beliefs have little epistemic significance in modal justification. It is no coincidence that the literatures on introspection and modal epistemology rarely intersect. Moreover, even if introspective beliefs have much significance in modal justification, they won’t constitute a sufficient number of the input-beliefs into the imagination system both in and outside PM-reasoning. We can have only so many introspective beliefs at any given time.

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<sup>21</sup> Thus, Lyons (2009) argues that Goldman’s distinction between belief-dependent and belief-independent systems isn’t so fine. Introspection is clearly belief-dependent, synchronically so, yet it isn’t an inferential system by any standard. Consequently, he argues that we should drop the belief-dependent and belief-independent distinction, and favour in its stead, the epistemically inferential and epistemically non-inferential distinction. See section (2.4.1) for a discussion of this distinction.

Memory systems are another type of belief-dependent systems that output basic beliefs. There are different kinds of memory, but these are the most common: working memory (executive function of short-term memory), procedural memory (remembering how), and episodic memory (memory of first-person autobiographical events), e.g., ‘I ate bread this morning’, and semantic memory (memory of general facts), e.g., ‘there are 1000g in a kg’. Usually, epistemologists are concerned with episodic and semantic memory, and given what they say, beliefs about them are basic (see, e.g., Lyons 2009). Here is how. Input-beliefs into memory systems are diachronic; i.e., old and non-occurrent. Because they are diachronic, they aren’t relevant to the inference being made. Recall that, to be relevant during an inference, a belief “needs to be tokened at the time of the inference” (Lyons 2009: 172). Thus, memory beliefs are non-inferential, and, so, they are basic. Memory beliefs, so construed, often feature in PM-reasoning. If you believe, for example, that ‘zombies are possible’, then some semantic memory beliefs, like ‘the Cartesian cogito’, most likely feature in that belief process.<sup>22</sup> Thus, when there is a sufficient number of memory beliefs in an instance of PM-reasoning, the reliability of the imagination system is bolstered.

One possible challenge, here, is that if semantic memory beliefs so often feature in PM-reasoning, then what happens in aphantasia, where the loss of mental imagery often comes with a loss of episodic memory (Fletcher et al. 1995). In which case, semantic memory won’t so feature in aphantasics’ PM-reasoning, since a loss of episodic memory often implicates semantic memory. If so, how then do aphantasics do so well in PM-reasoning, given what I said just paragraphs ago? This challenge doesn’t work. We have learnt, from patients with damage to the medial temporal lobes, that episodic and semantic memory stand or fall together. These patients have a severe episodic memory impairment that affects both anterograde (after the damage) and retrograde (before the damage) memory (see, Rosenbaum et al. 2008). But the premorbid semantic memory of such patients has been recorded to be largely spared (Manns et al. 2003), even though their premorbid episodic memory wasn’t. This seems to show clear signs of dissociation between episodic and semantic memory. As Greenberg and Verfaellie put it, “This dissociation provides support for the episodic-semantic distinction and suggests that episodic memory typically relies on [the medial temporal lobe] structures whereas semantic memories, once consolidated, rely on the neocortex instead” (2010: 748).

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<sup>22</sup> Hence, I said earlier (fn. 14) that when a PM-belief, particularly mathematically necessary beliefs like ‘ $2+2\neq 5$ ’, is *prime facie* justified, that it is probably output by a memory system and not by the imagination system. Recall that memory systems output basic beliefs, and, so, the PM-belief will come out as basic and *prima facie* justified.

Thus, even though episodic memory beliefs are ruled out alongside perceptual beliefs in cases of aphantasia, much of semantic memory beliefs will remain. And I suspect that semantic memory beliefs play a more integral role in PM-reasoning than episodic memory beliefs. That you remember some autobiographical details adds nothing to the justification of your PM-beliefs. This is corroborated by the fact that the subtype of memory that has been directly implicated in propositional reasoning is working memory (e.g., Johnson-Laird et al. 1992), which relies in large part, on a fully functional semantic memory (see, Laatu 2003). If so, then when semantic memory beliefs constitute a sufficient number of input-beliefs into imagination systems, the reliability of the systems are bolstered.

Some *a priori* beliefs are also basic, and it appears that, together with (semantic) memory beliefs, they will be important to PM-reasoning. But which *a priori* beliefs are basic? As Lyons (2009) explains it, the *a priori* beliefs that are basic are those that are structurally similar to general facts, or to what amounts to the same things, those that are output by a semantic memory system. The cogito is a good example, and that was why it could double as a general fact in our discussion of how input memory beliefs bolster the reliability of imagination systems. Thus, we must understand that the *a priori* beliefs we have in mind here are those that are naturalistically respectable. In this way, mathematical and logical general principles, like folk understanding of Peano axioms and the law of non-contradiction respectively, would also count as good examples. As with the case of the cogito, many mathematical beliefs, logical beliefs, and other naturalistically respectable *a priori* beliefs would constitute a large proportion of the input-beliefs into imagination systems. If I believe, for example, that ‘there are impossible objects’, perhaps because I have some paraconsistent logical beliefs (e.g. Priest 2016), then those logical beliefs are functioning like semantic memory beliefs for me when I form the PM-belief. I am not concerned about their justification as at that time; they are already justified for me, hence, my employing them in such belief-forming process.

In sum, when perceptual beliefs, memory beliefs, and some *a priori* beliefs constitute a sufficient number of the input-beliefs into imagination systems, their collective basic-ness, and *a fortiori* prima facie justification, will ensure that the reliability of the imagination system survives the inference that is quintessential to PM-reasoning. Thus, we can further specify the conditional reliability of imagination systems by defining basic input-beliefs into it:

IMJ\*: a PM-belief is justified if the imagination system that outputs it is either epistemically intentional or has some basic input-beliefs.

IMJ\* fares better than its older siblings. Yet, we must err on the side of caution, because it seems IMJ\* doesn't cover all grounds. Evidently, some input-beliefs into imagination systems aren't basic (fn. 17), and so, they are left out by IMJ\*. For instance, many (if not, most) of the input-beliefs into imagination systems during PM-reasoning would be testimonial and reasoning beliefs, and, while there are some uncertainties about the basicity of testimonial beliefs, everyone agrees that reasoning beliefs are non-basic. So, what then?

Firstly, testimonial beliefs: Within PM-reasoning, these will be the beliefs we come to hold based on what we read in journal articles or hear a colleague give a talk about. The basicity of testimonial beliefs is very controversial. Some (e.g., Lackey 2003) say testimonial beliefs are basic; others, like reductionists about testimony (e.g., Fricker 1994), imply that they aren't. I am more sympathetic to the former. If I read something in a journal article or hear a colleague give a talk about it, and, as a result, I come to believe the content of what I read or hear, then two of my cognitive systems seem to be manifestly at work: my visual system and language comprehension system. Uncontroversially, visual systems output basic beliefs (Chapter 2); so, if the testimonial belief is output by my visual systems, then the testimonial belief becomes straightforwardly basic. Also, if we accept Lyons' (2009) characterisation of perceptual systems (Chapter 2, again), then the language comprehension system (see section 1.5) seem to be perceptual in some sense, and, so, it will output basic beliefs too. In any case, whether taken individually or collectively, visual and language comprehension systems make a plausible and compelling case for the basicity of testimonial beliefs. In which case, what I said above about basicity suffices.

Secondly, reasoning beliefs: beliefs that are output by a reasoning system: I have talked at length about the idea that imagination, when used for PM-reasoning, is a form of reasoning. This will effectively make reasoning beliefs non-basic, since, as Lyons put it, any reasoning process would base its outputs on the premises it takes as inputs" (2009: 140). But there's no problem here whatsoever. Reasoning systems are inferential systems, their outputs are justified if only if their input-beliefs are justified. To stop regress, these input-beliefs would have to be basic at some point. We can safely assume that input-beliefs into the imagination system is not facing any sort of justification regress problem, or else they won't be *input*-beliefs in the first place. It seems farfetched that a belief, whose justification is still undecided, would be a premise in a reasoning process. If so, then we can say that the input-beliefs into the imagination system, which are reasoning beliefs, are all and only those that are justified in virtue of being based on some basic beliefs. Basicity is carrying the epistemic burden here again.



Thus, even though there could be input-beliefs into the imagination system whose status are undecided (testimonial beliefs), or input-beliefs that are non-basic (reasoning beliefs), what I have said about basicity suffices. IMJ\* doesn't need any further constraint, at least, not in view of accommodating non-basic beliefs. The reliability of the imagination system can be (and is often) sustained, even when input-beliefs into the system are non-basic, for most of those non-basic beliefs are justified in virtue of being based on some basic beliefs.

IMJ\* might still need a further constraint, however. It isn't equipped to block at least one notable challenge. Given the story I have told so far, which culminated in IMJ\*, it seems that the conclusion that imagination systems are reliable relies on self-verifying evidence. I seem to have begun from a question about whether imagination is a reliable belief-forming process, and arrived at an affirmative response, all the while using experiences of when the imagination system was reliable. This is the problem of bootstrapping (Vogel 2000; 2008). But I think the account of imaginative modal justification just defended is sufficiently equipped to avoid this problem. I will show how it does so in the next section.

### 3.4 Imaginative Modal Justification: Against Bootstrapping

Epistemic bootstrapping is when an agent moves from experiences about a belief-forming process to the reliability of that process without any external check. Here is a clear example with which we can begin our discussion:

*The Gas Gauge Case.* Roxanne drives a car with a well-functioning, reliable gas gauge. She has never looked into the status of the gauge or others like it; she has no information whatsoever on the subject. Rather, Roxanne automatically forms beliefs about the level of gas in the car's tank simply by consulting the gauge. For example, if the gauge reads "F" she immediately and directly forms the belief that the car's tank is full. Given that the gauge is reliable, it seems clear that Roxanne's belief that the car's tank is full is formed by a reliable process. Now, Roxanne can also observe what the state of the gauge itself is, if she chooses to. Roxanne notes that the needle reads "F" at the time when she believes, by reading the gauge, that the tank is full. Roxanne conjoins her belief

that the gauge reads “F” with her belief that the tank is full and deduces that the gauge reads accurately on this occasion. We can suppose that Roxanne repeats this strange procedure a good number of times, accumulating beliefs that the gauge reads accurately at various times  $t_i$ . Roxanne goes on to conclude by induction that the gauge is accurate in general, that is, that the gauge is reliable (Vogel 2008: 518–519).

The problem with Roxanne’s method is that she has promoted all her beliefs about the gauge to knowledge that the beliefs were formed through a reliable process, without any sort of evidence (Vogel 2000: 614). Had Roxanne performed some independent check, perhaps by using a dipstick, her reasoning would have been legitimate.<sup>23</sup> When bootstrapping occurs, it is epistemically defective, not just because of this lack of independent evidence, but also because were the process unreliable in actual fact, the agent would have come to the same conclusion that it is reliable. Roxanne would have arrived at the reliability of the gauge even if the gauge had never matched the contents of the tank.

As the above example makes clear, bootstrapping typically works by induction: from particular cases of when the process was reliable to a conclusion that the process is reliable.<sup>24</sup> Earlier (section 3.3), I said that despite the speculative nature of imagination, our intuition about it is that it is reliable in the actual world. I then proceeded to defend this reliability by saying imagination has the capacity despite being a non-factive mental state. I said that imagination can be characterised as *true* in terms of the imaginer’s epistemic possibilities. This is clearly a plausible story for the reliability of imagination *for an imaginer*, but not so clearly for the reliability of imagination *simpliciter*. And it seems my arguments in section (3.3) only managed to make the former case clear. For it seems I have inductively moved from the cumulative experiences of different independent imaginers to the conclusion that imagination itself is reliable. (Think of these imaginers as the accounts I cited in section (3.3) with which I explained that our intuition about imagination is that it is a reliable process in our world at least.) There seems to be no independent, external, and non-inductive reason for why imagination is reliable, given what I have said.

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<sup>23</sup> Building on this constraint, Cohen (2002) argues that bootstrapping isn’t just a problem for reliabilist epistemologies, but also for any foundationalist ones insofar as they downplay having prior knowledge of the reliability of a process.

<sup>24</sup> Consequently, Weisberg thinks bad inductive reasoning is what makes bootstrapping bad: “The moral will be that the issues raised by bootstrapping are orthogonal to questions about internalism and basic knowledge, having more to do with the nature of good inductive reasoning” (2010: 526). But see Titelbaum (2010) for how bootstrapping can still occur in the face of deductive reasoning.

It might be argued that, like Roxanne, none of those individual imaginers had any independent evidence for claiming that their imaginative process was reliable besides their own imaginative experiences. Such that, my move from those individual cases to the reliability of imagination seems illicit. The challenge then is this: The fact that the literature on the philosophy of imagination is replete with accounts from which the reliability of imagination is inferable (e.g., Moran 1994; Sheppard 1991; Chalmers 2002; Pouivet 2002; Funkhouser and Spaulding 2009; Nanay 2016) is insufficient to establish the reliability of imagination. Precisely because, were imagination completely unreliable, we wouldn't be able to tell given the contents of these accounts. In short, my basing the conclusion that imagination is reliable on the accounts is self-verifying. But what exactly is bad about an analysis that self-verifies? It gives a *no-lose analysis* (Titelbaum 2010).<sup>25</sup>

Simply, a no-lose analysis is one in which the agent knows in advance that their conclusion cannot be undermined. Put more sophisticatedly, a no-lose analysis is one in which, for all the ways things could be for an agent, the agent already knows that his conclusion cannot be undermined. The way Titelbaum tells the story, any epistemological account that's worth its salt shouldn't allow a no-lose analysis, because if "an [analysis] can't undermine a conclusion, it can't support it either [and] an epistemological theory that allows Roxanne to bootstrap permits a no-lose [analysis]" (2010: 122).<sup>26</sup> No-lose analysis is particularly a concern for the account of imaginative modal justification I've just defended. I have said that the relevant notion of truth for imagination, when used for PM-reasoning, is characterised in terms of the agent's epistemic possibilities, and 'epistemic possibilities', as we have just seen above, is part of the definiens for what a no-lose analysis is.

Here, then, is the problem: If, as I have argued, an imagining is true only when it coheres with all the ways things could be for an imaginer, then there had better be independent reasons for why imagination is a reliable process. Because, if there aren't, then it seems the imaginer already knows, given all the ways things could be for them that their imaginings will come out true, in which case their imaginative process isn't reliable. The challenge, then, for my imaginative modal justification

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<sup>25</sup> Titelbaum's preferred terminology is 'no-lose *investigation*'. I have replaced 'investigation' with 'analysis' here, because I want to skirt the logical details he gives for what counts as a no-lose investigation. In addition, because I want to speak in terms of 'accounts' rather than 'epistemic agents'. It seems that epistemic agents make *investigations*, but accounts make *analyses*. Titelbaum speaks in terms of epistemic agents.

<sup>26</sup> That bootstrapping is bad because it allows no-lose analysis isn't entirely undisputed. Different philosophers give different diagnoses. For instance, we saw Weisberg's (2010) argument that what is wrong with bootstrapping is just bad inductive reasoning (fn. 24, above). In fact, Van Cleve (2003) seems to urge us to welcome bootstrapping because, as he argues, any theory immune to it will be susceptible to overt scepticism. I am not welcoming overt scepticism because my account isn't *immune* to bootstrapping; but, as I will argue, it can avoid bootstrapping.

account can be stated in clear terms: Given the story told so far, it seems the conclusion reached about imaginative modal justification that culminated in IMJ\* cannot be undermined; it seems I know in advance that my analysis will yield the reliability of the imagination system, and, moreover, that it won't yield its unreliability; in short, it seems my imaginative modal justification account makes a no-lose analysis, and this, we have seen, is epistemically pernicious.

### 3.4.1 Avoiding No-lose Analysis

"If we want to avoid both overt scepticism and no-lose investigations, we must drop either Closure or epistemological externalism", Titelbaum (2010: 133) says. Since my account is externalist, I can't drop epistemological externalism, in which case, I am left with Closure. But what is Closure? Titelbaum answers: "*Closure*: If each premise in a set is justified, any proposition jointly entailed by the set is justified as well" (2010: 121). Put differently, if the analysis offered by an account about the reliability of a process is true, then the conclusion of that analysis, that the process is reliable, is true as well. Simply, Closure ensures that the reliability of a process is relative to what the process reports.

Closure, in itself, isn't epistemically pernicious. For instance, perception is a reliable process and there seems to be nothing besides perceptual reports that can legitimise the reliability of perception. (I will return to this shortly.) Thus, Closure seems to be why reliabilism is epistemologically sound. In fact, the importance of Closure may be extended beyond reliabilism to any foundationalist epistemological account, insofar as the account explains how a process is justification-conferring using only what the process reports.<sup>27</sup> For instance, my account of perceptual justification (Chapter 2) is reliabilist, and, in a weak sense, also foundationalist, and, so, it embraces Closure. I relied solely on perceptual reports to explain how perception justifies BM-beliefs. But the account doesn't allow anyone to bootstrap, even though it embraces Closure (see the next paragraph and fn. 28, below).

But, if it is true that Closure is why reliabilism and even some strands of foundationalism are sound, then it seems any reliabilist or foundationalist account that rejects Closure would be doing something bad. This is the point of Brueckner and Buford (2009). They argue that Zalabardo's (2005) solution to bootstrapping is problematic because it entails the outright rejection of Closure. They write: "[Zalabardo's] principle seems to be instrumental in generating the sceptical conclusion that perception is not a source of knowledge ... Since perceptual evidence is the only evidence available for warranting the claim that perception is reliable (no *a priori* warrant is

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<sup>27</sup> This seems to be why Cohen (fn. 23) was able to extend bootstrapping to foundationalist epistemologies.

available), and since this evidence cannot do the job in a non-circular manner, the reliability claim cannot be warranted.” (2009: 408–9).<sup>28</sup> Won’t my manoeuvre of rejecting Closure face a similar problem then? I think not. Unlike Zalabardo, I won’t be rejecting Closure outright; rather, I’ll only be rejecting it within my account of imaginative modal justification. To be clear, Closure can’t be denied for some reliable processes, like perception; but it can surely be denied for some others, like imagination. Recall that imagination is not on a par with perception in terms of reliability.

Now that we know what Closure is, we can ask how we should go about dropping it. Titelbaum gives a clue: “one might have a theory on which an agent’s justification for a proposition is always relative to a set of alternatives. If moving from premises to entailed conclusion changes the set of relevant alternatives, justification may not be preserved, and Closure may be violated” (2010: 128). For example, if the relevant alternatives for Roxanne include cases when the gauge reading fails to match the contents of the tank, then Roxanne shouldn’t infer the reliability of the gauge from only her experiences of when the gauge was reliable. This is because the alternatives—when the gauge reading failed to match the contents of the tank—would have made her see that the gauge isn’t reliable, as she thought it was. Put simply, a process must report on some matter other than its own reliability, such that inferring only from cases when it is reliable to a conclusion about its reliability becomes illicit. I think my account of imaginative modal justification is equipped to accommodate this way of rejecting Closure.

There are independent reasons, besides my arguments in section (3.3), why imagination is reliable. But despite the independence of these reasons from my arguments, they are entailed by them. This entailment ensures that the reasons are, in some ways, parts of what my account *reports*. The relevant question then becomes: What other matters does my imaginative modal justification account report? I will emphasise one such matter: the systematic similarity between imagination and belief. The way Nichols and Stich (2003) tell the story about the architecture of imagination, we can get a glimpse into what happens in the imagination box by taking a closer look at what happens in the belief box. This is because the updater also works in non-imaginative everyday episodes; i.e., in normal belief-formation processes. Nichols and Stich explain that this is so because, intuitively, some newly formed beliefs will be incompatible with our pre-existing beliefs. This much I have covered (section 3.2.1). What I didn’t say earlier, which I didn’t need to arrive at IMJ\*, is what follows from this thought that the updater works in both imaginative episodes and in non-imaginative episodes.

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<sup>28</sup> This is why I didn’t discuss bootstrapping as an objection to my perceptual modal justification account (see section 2.4.2, fn. 37).

According to Nichols and Stich, it follows that the updater treats imaginings in much the same way as it treats beliefs—this is why it can work in both imaginative and non-imaginative episodes in the first place. In addition, they argue that since the updater is part of the inference mechanism (see fig. 3.1), the inference mechanism will also treat imaginings and beliefs in much the same way. The lesson they take from this is that “the representations in the [imagination box] have the same logical form as representations in the Belief Box, and that their representational properties are determined in the same way [such that] the representations are in the same code” (Nichols and Stich 2003: 32). In a standalone work, Nichols (2004) goes on to call this the *single code hypothesis*.

The single code hypothesis generalises from this fact about the updater and the inference mechanism, to any other mechanisms or systems that take representations from both the imagination box and the belief box as input: “More generally, for any mechanism that takes input from both the [imagination] box and the belief box, the [imagination] representation  $p$  will be processed much the same way as the belief representation  $p$ ” (Nichols 2004: 131). Nichols has consequently put the hypothesis to much use: in resolving imaginative resistance in fiction (Nichols 2004), and in mathematical/logical cases (Nichols 2006a). (I will return to the latter case in section (4.3.2).) In short, despite the systematic dissimilarities between imagination and belief, the single code hypothesis offers an important way imagination and belief are systematically similar.

Even though I didn’t rely on the single code hypothesis in defending my account of imaginative modal justification, there is a sense in which the hypothesis is foreshadowed by what I said. I relied on the cognitive architecture of imagination, and, as Nichols makes clear: “the hypothesis can *only* be framed against a background of cognitive architecture” (2004: 131, my italics). Thus, by building my account of imaginative modal justification on the cognitive architecture of imagination, the account reports, in some sense, the single code hypothesis even though it doesn’t rely on it. What is left then is for the hypothesis to be useful in disavowing Closure. I think it manages just that.

The single code hypothesis can serve as a relevant alternative from which the reliability of imagination can be inferred. Since the hypothesis captures the systematic similarity between imagination and belief, and we know that belief is indispensable to our epistemic framework, we can infer from that indispensability to the reliability of imagination. But not just that, the beliefs that are structurally similar to imaginings will be all and only those that are well-formed. This rules out beliefs that aren’t well-formed; e.g., wishful thinking beliefs. This, in part, is why imagination produces true beliefs rather than false ones (section 3.3.1). Besides serving as an alternative from which we can infer the reliability of imagination, the single code hypothesis can constrain any sort

of bad inductive reasoning that might generate bootstrapping in my analysis. For we can now add this further constraint to our imaginative reasoning process:

*Non-imaginative premise:* If an imagining isn't treated in the same way a belief would be treated by any mechanism or system that takes imaginings and beliefs as inputs, then the imagining lacks the right representational properties, in which case the imagination system that yields it isn't reliable.

With this non-imaginative premise, Closure is denied. For even if my analysis allows bootstrapping, the faulty reasoning that led to bootstrapping is now constrained by this non-imaginative premise. The point here is that we can move from this non-imaginative premise to the reliability of imagination; i.e., we can move from the representational properties of beliefs, through the single code hypothesis, and arrive at the reliability of imagination. And this works either independently of my arguments in section (3.3) or in addition to it. Thus, we can add a clause for inferential support from non-imaginative premises to our specification of the reliability of imagination systems:

IMJ: a PM-belief is justified if the imagination system that outputs it is either epistemically intentional or has some basic input-beliefs and is inferentially supported from non-imaginative premises.

I think IMJ covers the required grounds. It gives the conditions that the imagination system must meet for it to be reliable. And I have argued that these conditions, when met, enable the PM-beliefs that are output by the imagination system to be justified. By considering the process with which we form PM-beliefs, we can see whether or not we are justified in holding the beliefs. Importantly, IMJ easily avoids the problem of bootstrapping, since it can be complemented to block a no-lose analysis. Does IMJ still require an account for defeaters? I think such an account would be superfluous, not least because bootstrapping is defeating.

### 3.4.2 Defeat is Superfluous

Reliabilist epistemologies are keen on accounting for defeaters in terms of a defeating alternative process. Here is Goldman: "The justificational status of a belief is not only a function of the cognitive processes *actually* employed in producing it; it is also a function of processes that could and should be employed" (1979: 102, original italics). That is, a justified PM-belief would be defeated, if there were alternative reliable systems that were available to the believer, such that, were they used in addition to or instead of the imagination system, they would have resulted in the believer not holding the PM-belief.

The relevant question then becomes: What other alternative cognitive systems are available to believers that could be used instead of or in addition to imagination? A few: counterfactual reasoning systems (see, Williamson 2007) and intuition systems (see, Sosa 2000), for example. For simplicity's sake, let us focus on counterfactual reasoning systems. Even though counterfactual reasoning is typically rationalistic in nature, as is evident in its close association with counterfactual-based rationalist modal epistemology (section 1.2), I have said that there is no reason why it cannot be empirically studied (section 1.3). For example, Kroedel (2017) already shows that an empiricist account of counterfactual reasoning as an epistemic access to modal facts can work. Getting to a naturalist account of how PM-beliefs are justified through counterfactual reasoning from where Kroedel stops shouldn't take much work.<sup>29</sup> Thus, in principle, the systems that output counterfactual reasoning can be alternative systems that are available to any believer who forms PM-beliefs through her imagination. The challenge, however, is that, given what I said in this chapter, the systems that output counterfactual reasoning have already been used *in addition* to the imagination system, by the epistemic agent during PM-reasoning.

As I have argued, many input-beliefs into imagination systems are output-beliefs from some reasoning systems (section 3.3.2), such that counterfactual reasoning systems must already have been used, in addition to the imagination system, by an epistemic agent during PM-reasoning. If so, and since 'being used in addition to' is part of the explanans of Goldman's theory of defeat, it follows that counterfactual reasoning systems can't serve as defeaters to the justification of PM-beliefs. That is, counterfactual reasoning systems have already been used in addition to the imagination system in the formation of PM-beliefs, and, as I have argued, the imagination system already came out as reliable (sections 3.3 and 3.4.1). This inability of defeaters to do their job is the major reason bootstrapping was a significant problem for the defended account of imaginative modal justification—defeaters have been incorporated in its favour. But, as we have seen, the problem of bootstrapping isn't fatal to the account at all. With some minor modification, the problem was avoided.

I am not saying that what is possible when imagination is being used as the epistemic access to philosophical modality is also possible when any other alternative cognitive faculty replaces imagination as the epistemic access to philosophical modality. If the epistemic access to philosophical modality for me is imagination, but counterfactual reasoning for you, then zombies might be impossible for you, and possible for me, or vice-versa. In such cases, what I have said in

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<sup>29</sup> See section (1.3) for a distinction between empiricism and naturalism. As a brief reminder: all naturalists are empiricists, but not all empiricists are naturalists.



this chapter doesn't apply. There are no common grounds to facilitate any substantive discussion. To reiterate: my aim is to give a psychological explanation of what happens when we use imagination for PM-reasoning. That is, my aim is limited: it is directed only at those occasions when imagination is being used for epistemic access to philosophical modality. And, on those occasions, I have said that imagination recruits the cooperation of other cognitive faculties, which could be used as epistemic access to philosophical modality.<sup>30</sup> Does the converse hold? Is the cooperation of imagination recruited when other cognitive faculties are used as the epistemic access to philosophical modality? Only after an extensive study of those faculties (like the one I embarked on here for imagination) has been undertaken can this question be answered. In sum, IMJ doesn't need an additional theory of defeaters. It's just fine as it is.

### 3.5 Summary

In this chapter, an account of imaginative modal justification was the target. The chapter began by considering whether philosophical modality can be explained in terms of the cognitive architecture of imagination. It was argued, by way of psychologising philosophical modality, that philosophical modality can be explained in terms of the architecture of imagination. A belief-forming module was then postulated to explain the formation of philosophical modal beliefs in terms of this architecture, such that the imagination system described by the architecture becomes a belief-generating system and not just an imagining-generating system. This then enabled justification-talk via reliability. The reliability of the imagination system was defended, such that its reliability explained how it outputs justified PM-beliefs. The end point was an account of imaginative modal justification that is non-experientialist, non-foundationalist, non-phenomenalist, but reliabilist, inferentialist, doxastic, and partially coherentist.

As I mentioned earlier (section 3.2), some aspects of this chapter might come off as overly optimistic, perhaps because most of its theoretical assumptions are hypothesis from speculative theoretical psychology, not findings from neuroscience. What I did in this chapter was to look at some accounts that tried to make sense of imagination and see whether they can illuminate the epistemic role imagination plays in philosophical modalising. Consequently, the argumentations and conclusions in this chapter are unavoidably less forceful and are also not as direct as those in Chapter 2, where we used neuroscientific findings to defend the reliability of perception when

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<sup>30</sup> Does this mean imagination is a better guide to philosophical modality than those other cognitive faculties? It might; it might not. Nothing in what I have said suggests that it is.

used BM-reasoning. Nonetheless, both chapters are complementary—the reliability of imagination when used for PM-reasoning is bolstered by some BM-beliefs that are already perceptually justified. The resultant account of imaginative modal justification nicely explains how PM-beliefs are justified, despite having less BM-beliefs featuring in them.

I must say that it is possible that some details in the defended account of imaginative modal justification be replaced or defeated as ongoing empirical researches on imagination produce findings that have less speculative and more neuroscientific bases. The conclusions reached in this chapter, then, might not be as secure as one would want, but they are still interesting and promising vis-à-vis explaining the justificatory role of imagination in philosophical modalising. In fact, even though I haven't considered it in detail, the conclusions reached in this chapter support what Timothy Williamson has been saying for a while now about the epistemic role of imagination in modalising. He has repeatedly argued that imagination plays fundamental roles in modalising, not just by being integral to survival during the earliest days of reasoning (2016a), but also by facilitating counterfactual reasoning (2007). Also, the conclusions reached in this chapter complement rationalist defences of the justificatory role of imagination in modalising (e.g., Geirsson 2005; Ichikawa, and Jarvis 2012).

This concludes the research questions that this dissertation sets out to answer. To remind ourselves, the questions were: In what ways does (i) perception justify BM-beliefs, and (ii) imagination justify PM-beliefs? I addressed (i) in Chapter 2 by way of defending an account of perceptual modal justification. I addressed (ii) in this chapter by way of defending an account of imaginative modal justification. Although not directly an extension of each other, these two accounts show that experience, via perception and imagination, does play a necessary role in the formation and justification of our modal beliefs. And this is the task I set for myself in this dissertation. But there are areas of the arguments I gave in these research chapters, which require clarification, but didn't get one. General objections to my naturalistic project as a whole, and implications of the project have also been left unaddressed. These will constitute the content of the last part of this dissertation.

## **PART III**

# Chapter 4

## Modal Psychology: Clarifications, Objections, and Implications

### 4.1 Introduction

This chapter rounds off this dissertation. In section (4.2), I clarify some issues about the account of perceptual modal justification defended in Chapter 2, and the account of imaginative modal justification defended in Chapter 3. This way, I hope to fortify the modal psychology project that was the goal in this dissertation. In section (4.3), I respond to some objections that the project faces. In section (4.4), I discuss some important implications of the project. I then give a general conclusion in section (4.5).

### 4.2 Clarifications

Some aspects of the arguments in Chapters 2 and 3 are potentially damaging to the conclusions reached in those chapters if left unclarified. However, they were postponed because it would make more sense to clarify them once we have concluded the arguments in those chapters. Clarifying them is the task in this section. Thus, an inventory of such obscure issues will set things up for this section.

In Chapter 2, in a bid to defend an account of perceptual modal justification (PMJ), I rejected the Humean metapsychological thesis. To reject the thesis, I relied on the Gibsonian notion of affordances to provide empirical evidence for my account. What I couldn't do then was to respond to one objection concerning the metaphysics of affordances, which would block affordances from being evidence for any argument that aims to reject the Humean metapsychological thesis. I will respond to this objection in section (4.2.1).

In Chapter 3, in a bid to defend an account of imaginative modal justification (IMJ), I endorsed cognitive-architectural constraints for imagination. This provided an easy way to psychologise philosophical modality. I proceeded from this psychological analysis of imagination when used for philosophical modality, to the reliability of imagination when so used. This is where scepticism might arise. Such scepticism might be that when we lay out the cognitive-architectural constraints of imagination when used for philosophical modality, we might see that we shouldn't trust the verdicts of imagination when so used. I will respond to this sceptical challenge in section (4.2.2).

Since IMJ and PMJ both build on some cognitive-architectural constraints, they face a general worry, which is that, whatever the relevant cognitive systems dictate is what is correct. And, if this is the case, such that there are no objective standards with which modal judgments can be appraised, then I am committed to some form of anti-realism about modality. However, since the idea in this dissertation was to begin with a working commitment of modal realism and consider whether psychology can help us find good epistemic reasons for our modal beliefs (section 1.1), winding up with an anti-realist commitments would defeat the whole project. Thus, if this general challenge is right, then this project has failed by its own standards. I will respond to this challenge in section (4.2.3), by explaining how PMJ and IMJ mesh with my modal realist metaphysical framework.

#### **4.2.1 Perceptual Modal Justification**

Conceptualising the appropriate metaphysics for affordances is a difficult task, partly because Gibson himself wasn't interested in any metaphysics, even though he made some metaphysical remarks about affordances. For example, he says: "An important fact about the affordances of the environment is that they are in a sense objective, real, and physical, unlike values and meanings, which are often supposed to be subjective, phenomenal, and mental. But, actually, an affordance is neither an objective property nor a subjective property; or it is both if you like" (1979: 129). This unclarity about the metaphysics of affordances has spiralled into a debate between dispositionalism and relationalism about affordances. Affordance dispositionalism is the view that affordances are dispositions; i.e., aspects of the environment that are related to agents, which simultaneously have independent existence (e.g., Turvey 1992; Scarantino 2003; Heras-Escribano 2017, 2019). Affordance relationalism is the view that affordances are relations between features of the environments and abilities of organisms (e.g., Chemero 2003; Stoffregen 2003; Prosser 2011).<sup>1</sup>

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<sup>1</sup> See Wells (2003) for a critical review of the existing accounts of affordances.

PMJ doesn't face any problem with affordance relationalism. This is because affordance relationalism is compatible with modal realism. Relations are just *properties* with more than one adicity, in that they require more than one particular to manifest; e.g., *being taller than*. And property-talk entails modal realism in one way or other. It may, however, be said that one can be anti-realist about properties as well, perhaps by being nominalist, such that affordance relationalism becomes incompatible with modal realism. But this isn't completely true: nominalism, in its various forms, seems unable to be expressed without the possible worlds framework<sup>2</sup> (see, Rodriguez-Pereyra 2019). And since the possible worlds framework cannot be used without realist commitments, either in a genuine way á la Lewis (1986) or in an ersatz way á la Sider (2002) for example, nominalism about properties doesn't really entail anti-realist commitments. It is a mistake to say it does. Thus, I will skip affordance relationalism here, since it doesn't pose any problem to PMJ.

Affordance dispositionalism can be realist or anti-realist. When it is realist, affordances exist whether or not they manifest at any given time. When it is anti-realist, affordances exist only when they manifest at a given time. Since I have endorsed modal realism as my metaphysical framework in this dissertation (section 1.1), PMJ faces no problem with affordance dispositional realism also. For the same reason of endorsing a realist metaphysical framework in this dissertation, PMJ faces a problem with affordance dispositional anti-realism. The problem is that, if affordances are taken as dispositions, and dispositions are understood in an anti-realist sense, then affordances would support rather than weaken the Humean metapsychological thesis. For there won't be modal facts in the world, and, so, experiences, as Hume theorizes, will be exhausted by the actual. If so, then we need affordances to be understood in an anti-Humean sense for my arguments in Chapter 2 to work. Heras-Escribano (2019) gives a recent defence of this anti-realist approach to affordance dispositionalism.<sup>3</sup>

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<sup>2</sup> This is roughly because nominalism rejects abstract objects and universals, and both are the kind of entities that are taken to be non-spatiotemporally located. In which case, one way to make sense of them is through the possible worlds framework. To reject something, you have to first explain it in an appropriate way; so, nominalism will have to explain abstract objects and universals appropriately, i.e., in possible worlds framework, before rejecting them. To my knowledge, there is no nominalist account of property that doesn't utilise the possible worlds framework.

<sup>3</sup> Although he doesn't think his account is anti-realist. He argues that dispositionalism divides into factualism and non-factualism. Realism and anti-realism, he argues, are types of factualist dispositionalism. Non-factualist dispositionalism constitutes a *sui generis* kind of dispositionalism. But I think this disambiguation is superficial. The contents of his non-factualist dispositionalism, as we will see, deny explicitly that dispositions are *in* the world, and that is just anti-realism, or, if you want, non-realism. I am aware that anti-realism and non-realism do not necessarily mean one and the same thing, but both anti-realism and non-realism work for our purposes here. They both deny that affordances are in the world. I only use anti-realism to sustain the dialectic that has gotten us this far.

According to Heras-Escribano, affordances may be dispositions, but they aren't dispositions in any metaphysical sense. Rather, they are only dispositions in a conceptual sense. He calls this conceptual notion of dispositionalism, a non-factualist approach to disposition à la Ryle (1949). But what does Ryle say about dispositions? "According to Ryle, dispositions were tendencies and abilities, not facts; that is, they were not entities or 'occult happenings' that trigger manifestations" (Heras-Escribano 2019: 82). This way, dispositions are not referential or denoting terms: they do not point to anything in the world. But, if dispositions aren't extra entities in the world, what are they? "In this sense, dispositional terms are not an expression of occult factual elements like entities or forces, but discursive 'tickets'. These tickets are useful to move from one explanation to another, without needing to commit ourselves to any kind of special entity that causes this change" (Heras-Escribano 2019: 82). Translating this into affordance-talk, he writes:

The main idea is that affordances only make sense within the organism–environment system: the word 'affordance' does not point to something external or internal, it emphasizes the complementarity of the two poles of the system ... The concept, then, does not refer to another entity different from 'organism' and 'environment' that is included within the organism–environment system; on the contrary, the term 'affordance' denotes a special way of complementing capacities of the organism and aspects of the environment that are shaped as a system (2019: 86).

The challenge that PMJ faces with this novel anti-realist construal of affordances is this: If affordances are mere discursive tickets and not referential or denoting terms, such that there is nothing in the world they point to, then affordances can't be part of perceptual content. In which case, perception, contrary to what I said in Chapter 2, lacks modal content, and, so, the Humean metapsychological thesis stands. This then would undermine the reliability of perception when used for making BM-judgments, and since PMJ builds on the reliability of perception when so used, it crumbles. Some clarifications are in order, then.

Firstly, a dismissive response. Although I placed much of the explanatory burden in my defence of PMJ on affordances, I made clear beforehand (section 2.2), that my arguments can be expressed in non-Gibsonian terms. I specified that PMJ is defensible from non-Gibsonian perspectives as well. Nöe's (2004) enactivist and Nanay's (2011a, 2012a) representationalist accounts are alternatives to affordances, which I considered as alternative foundations for PMJ. And this is helpful, because with these alternatives, the defended account won't have this problem that ensues because of the explanatory burden placed on affordances. More importantly, I used affordances

as the foundation for PMJ instead of these alternatives only because it has been more extensively researched than them, and it allows more direct integration of original findings from cognitive (neuro)science, cognitive psychology, and evolutionary psychology. In principle, nothing in my account would have been altered had I used one of these alternatives as the foundation for PMJ.

Moreover, one can talk about the psychology of perception with affordances occupying a central place in such talk, without getting dragged into the debate about the metaphysics of affordances. Gibson himself, as I mentioned earlier in this section, didn't spend much time on the metaphysics of affordances. In addition, many theorists who are interested in what lessons we can learn from affordances about perception (e.g., Nöe 2004; Nanay 2011a; Williamson 2016b; Nolan 2017), go about their analyses without engaging in any metaphysical debate. But I concede that, unlike these theorists, there is a sense in which I engaged with such debate. I not only drew a metaphysical implication from affordances with regards to perceptual content, I also built on the drawn implication in my defence of PMJ. Thus, here is a non-dismissive response to Heras-Escribano's non-factualist affordance dispositionalism.

One major problem the account faces is that it hyper-intellectualises the psychology of perception. What Gibson sets out to achieve is not just how to *make sense of* the psychology of perception, but what the appropriate psychology of perception *is*. This is why his metaphysical remarks about affordances have continued to generate metaphysical debate over the years. It is not clear to what extent Heras-Escribano appreciates this point. His non-factualist dispositionalism seems to revolve around only how to make sense of the psychology of perception. He writes: "Ryle moved the discussion of the explanatory power of dispositions from a metaphysical to a semantic approach, *focusing on what we do when we use dispositional terms for explaining our tendencies and abilities*" (Heras-Escribano 2019: 83, my italics). But this just restricts affordances to philosophy lecture rooms and articles, whereas, affordances clearly outstrip philosophical discussions. Here is one instance of this restriction: "Affordances are not, then, extra entities that proliferate in our world, but *a way to explain* the complementarity of organism and environment" (Heras-Escribano 2019: 87, my italics).

It goes without saying that affordances are not just a way to explain the complementarity of organism and environment, but also what the complementarity is. If there are aliens that have perceptual systems in the universe, and they lack the concepts of 'affordances' and 'dispositions', their complementarity with their environments would still count as 'affordances'. The point here is that perceivers need not have the need or means to explain their complementarity with their environments to perceive the things we call affordances. Non-human animals surely lack the need



or means to give explanations, yet they perceive affordances. This is why I find Heras-Escribano's discussion of minimal cognition (his section 7.1) quite underwhelming. One would expect that he would tackle head-on how his non-factualist affordance dispositionalism works for perceivers who lack the need and means to explain their complementarity with their environment. But he explains only how affordances (and there is no indication that he is even talking about his own non-factualist account) can aid minimal cognition, which is as an underserved field of study. In short, I think Heras-Escribano commits a category mistake.

Thus, whatever the merits of taking affordances as discursive tickets, those merits come at the costly price of hyper-intellectualising the psychology of perception. But hyper-intellectualising the psychology of perception does not merely underserve what affordances are, it also makes them epistemically inert. And I think most cognitive scientists and epistemologists would frown at such a position. Affordances do not just help us to make sense of the perception of non-human animals, they are also epistemically relevant themselves. For instance, if we agree with Burge (2003) that some non-human animals can form perceptual beliefs, and since that means they can form BM-beliefs, then we must expand the class of beliefs we take to be immediately justified to include some non-human animals' beliefs. But we won't be able to do this if we fail to retain a metaphysics for them. More importantly, the retained metaphysics had better be realist, for, as Tugby (2013) says: "I have argued that, if one's allegiance is with the dispositionalist side of the battle, that means accepting a certain Platonic [or realist] view of properties" (2013: 478), or else we must let go of affordance dispositionalism altogether. Thus, the only way I see that Heras-Escribano can sustain his non-factualist affordance dispositionalism is to agree that affordances are epistemically inert. Or else, he must be factualist and realist about affordance dispositionalism, or let go of affordance dispositionalism altogether.

Realism about affordance dispositionalism is the view that affordances are dispositional entities, which are real and concrete in the world. Under this construal, affordances are here with us in the actual world; they are not mere semantic devices, but real facts in the world. For instance, Vetter says: "The disposition itself is there, it is part of actuality ... It's not the kind of property that stimulates our retina, but it is there to be perceived ... I suggest that for this reason, such an anti-reductionist disposition is the best fit for a dispositional account of affordances" (2018: 22). Scarantino (2003) makes a similar point. If so, then affordances do the job I set them out to do in Chapter 2—they serve as an empirical basis in the campaign against the Humean metapsychological thesis. Contrary to the thesis, perception has inherently modal content, and, so, perception plays a necessary role in the formation and justification of modal beliefs.

Should this not be sufficient to assuage the modal sceptic, it still suffices as an empirical study that sets in motion the process of reviewing the long-lasting Humean tradition about the non-modality of perceptual content. For a considerable time, modal sceptics have based their scepticism on the Humean metapsychological thesis, and, in fact, we have allowed the thesis to dictate the pace of modal epistemology (sections 1.2 and 1.3). An alternative picture that changes the narrative is, therefore, worth having.

#### 4.2.2 Imaginative Modal Justification

Scepticism about modality isn't localised to perception; it also extends to imagination. Imagination seems to be inextricably linked with modality. For example, Shalkowski writes: "Certainly, conceivability, broadly construed, plays an important role in forming modal judgements. It is hard to see how we could get started on the modal enterprise without it" (1996: 282). Yet, despite this close association, scepticism about the verdicts of imagination in modal matters abounds. Such scepticism is directed to accounts of the usage of imagination like my imaginative modal justification (IMJ) account.

In a bid to defend the reliability of imagination when used for philosophical modal (PM) reasoning, I endorsed cognitive-architectural constraints for imagination (Nichols and Stich 2003). I consequently showed (section 3.2) how the architecture of imagination can be extended to philosophical modality. Nichols (2006a) doesn't doubt we can do this for philosophical modality, but he warns that when we do it, i.e., extend the architecture of imagination to philosophical modality, we see clearly that imagination isn't reliable when appropriated in the service of philosophical modality. He writes:

[I]f the modal psychology sketched here is right, it might contribute to a sceptical view about the epistemic status of imagination-driven intuitions of absolute modality ... when this imaginative capacity is appropriated in the service of judgments of *absolute* possibility and necessity, it's less clear that we can trust the verdicts. For here the psychological systems are being used outside their natural domain. Hence, there's less reason to think that they will be successful guides in this foreign terrain of absolute modality (2006a: 253, original italics).

If this sceptical view about the epistemic status of imagination-driven intuitions of absolute or philosophical modality is correct,<sup>4</sup> then there is a problem for IMJ. This is because, contrary to what I said in Chapter 3, imagination would turn out to be unreliable when used for PM-reasoning. In which case, IMJ crumbles, since it is built on the reliability of imagination when so used. Some clarifications are in order, then.

From the statement above, it is clear that Nichols holds this sceptical position because he thinks that after we extend the architecture of imagination to accommodate philosophical modality, as I did in Chapter 3, we would see that PM-reasoning isn't the *natural domain* of imagination. In his view, imagination's natural domain is risk and opportunity assessment: "Given certain widely shared assumptions, like the assumption that the future will resemble the past, it's plausible that the imagination provides a good guide to risk and opportunity. That's in part what it's designed to do" (Nichols 2006a: 253). One may say, then, that the following idea underlies his thought: The reliability of a cognitive system, when used for a certain purpose, depends on the functions the system evolved to perform.<sup>5</sup> But this thought just seems wrong.

Consider geometric cognition. It is generally regarded as the product of some basic spatial cognitive capacity (e.g., Spelke et al. 2010), like the one that facilitates our ducking to avoid bumping our heads, reaching accurately for objects in range, etc. The consensus, however, is that this basic spatial capacity might be what got us started in geometry, and also that the transition from the basic spatial capacity to geometry wasn't the achievement of any single individual. As Hohol and Milkowski put it: "[An adequate account of geometry cognition] should recognize "hardwired," or evolutionarily early, cognitive abilities that are necessary to engage in Euclidean geometry, such as natural sensitivity to distance (proximal–distal), sense (left–right) and angle, and thus explain where geometric cognition comes from. The account should describe how these "hardwired" cognitive prerequisites are combined during ontogeny into a system of abstract geometric representations" (2019: 4).

It is clear then that, even though geometry is an elaborated development of a function of basic spatial reasoning, it evidently wasn't what spatial reasoning evolved to perform, and we don't, for that reason, distrust geometry. Both Euclidean and non-Euclidean geometry are presently very important to our understanding of the world and of the universe. In fact, some other sophisticated

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<sup>4</sup> Although there is the challenge that, given what I said in (section 1.4), absolute and philosophical modality do not mean the same thing, but I will take them to be synonymous in this chapter.

<sup>5</sup> It may be said that I am setting up a straw argument, since this thought comes very close to 'exaptation', which is a common concept in evolutionary biology that Nichols must be aware of. But given his statement, which I quoted above, I can find no other reason why he holds such a sceptical position.

aspects of our life, like architecture and engineering, would become unworkable without them. It would be absurd to say that, because our spatial reasoning evolved only to stop us from banging our heads on the tops of caves, we should distrust the verdicts of our spatial reasoning when used for geometric cognition. Yet, geometry isn't the natural domain of our spatial capacity.

Our basic spatial capacity already got us into the geometry game, and, even though the elementary geometry-ish things we were able to do with the basic spatial capacity aren't guaranteed to be right, we have disciplined them to such a degree that we can now do things that the basic spatial capacity could never do. Of course, these elementary geometry-ish things won't get us interesting mathematical facts, like the transcendence of  $\pi$ , but they do get (and have gotten) us to complex mathematical reasoning that yields that kind of interesting mathematical facts. From walking to cut distances between three L-shaped points, we have constructed the idea of triangles, and from there to quadratic equations, trigonometry, and so on. What's more, this complex mathematical reasoning often becomes alienated from the perspective of our spatial capacity that got us into the game in the first place, such that the complex mathematical reasoning needs not always depend on the basic spatial capacity. Indeed, findings from complex mathematical reasoning can (and often do) trump findings from basic spatial capacity. There is a video of the MIT physics professor, Walter Lewin, on the internet, where he stood in front of a swinging big iron pendulum, to demonstrate to his students that a pendulum, when released from a certain location could never swing pass that location. His complex mathematical reasoning is trumping his basic spatial folk intuitions, or else, he would have bolted as the pendulum swings forcefully towards his face.

It may be said that this argument has things the wrong way around. That we have a 'geometric module' underlying spatial navigation (e.g., Cheng 1986), such that saying geometry is a function of basic spatial cognitive capacity inverts things, and, so, the analysis just offered is false. But it seems quite straightforward that, unlike spatial reasoning which everyone (regardless of age) possesses, not everyone has the rigorous knowledge of geometry. This is corroborated by the fact that the existence of a geometric module has recently been criticised by the same theorists who posited its existence in the first place (see Cheng et al. 2013). If so, then we haven't inverted things by saying geometry is a function of our basic spatial cognitive capacity. Spelke and collaborators implicitly express this rejection of a geometry module when they say that geometric cognition, as a whole, "is founded on at least two evolutionarily ancient, early developing, and cross-culturally universal cognitive systems that capture abstract information about the shape of the surrounding world" (2010: 865). We have no geometric module; so, there's no plausibility in saying the module was at work all along in spatial reasoning and ultimately in geometric reasoning.

The point here is that the functions a cognitive system/capacity evolved to perform are not as significant in appraising the verdicts of the system when used for a newly evolved function, as Nichols might think. Certainly, our capacity for PM-reasoning evolved much later, perhaps with the evolution of logical reasoning (see, Woleński 2016), and imagination may have already been doing the job of risk and opportunity assessment at that time, but that doesn't mean imagination is unreliable when now used for PM-reasoning. Like spatial capacity in geometric cognition, we use many cognitive capacities/systems outside of their natural domain, and we should not, thereby, start distrusting their verdicts when so used. Thus, unless arguments that do not build on the 'natural domain' of imagination are given for why imagination is unreliable when used for PM-reasoning, we are within our rights in maintaining in saying that it is reliable when so used. Scepticism about the usage of imagination for PM-reasoning may succeed, but none that trades on the original evolutionary function of imagination can.

### **4.2.3 Naturalism via Moderate Psychologism**

Although the term 'psychologism' can be used or interpreted in a variety of related ways, a general understanding is that the realm of study relies upon, or is constituted by, facts and issues of human psychology (e.g., Nicola 1967). Put simply, psychologism is the view that a realm of study is a function of human psychology. There are four related ways a theory can be regarded as psychologistic: If it "(i) identifies] the target science with how individual people cognise about that science, [(ii) identifies] the target science with some description of the observable performance of people's behaviour in the realm, [(iii) argues] that whatever might be discovered about the target science is a function of the human cognitive machinery that is doing the discovering, and that this machinery itself has been shaped by the world in which it must operate, [and (iv) identifies] the science with what an ideal cognizer would cognize about that science" (Pelletier et al. 2008: 8, my parentheses).

My brand of naturalised modal epistemology falls under (iii): It is founded on the view that there are some specifiable cognitive systems by which the human mind works to form modal beliefs; namely, perceptual and imaginative systems. These systems have access to certain information, and their resulting outputs are to be understood as conditioned by the ways in which the systems operate. But, without clarifications, this sort of general description might problematize my naturalised modal epistemology. This is because, it can be argued that the cognitive-architectural constraints that my naturalised modal epistemology builds on, imply that the field of modal epistemology is determined by perceptual and imagination systems. In which case, the appropriate metaphysical framework should be anti-realist. This is the point of Pelletier and collaborators when

they say that “If one chooses the alternative that there is some external-to-the-module standard, then the theory is no longer psychologicistic, and becomes realistic instead ... But on the other hand, if the field of [study] is determined by the workings of the [relevant] module, then the notion of an error becomes quite dicey” (2008: 46).

These, then, are the desiderata that my naturalised modal epistemology mustn’t meet, or else the general description above about how it can be termed psychologicistic renders it unworkable:

- (D1): the field of modal epistemology is determined by the cognitive systems at work when we modalise;
- (D2): what is correct or incorrect in modal epistemology is determined by the cognitive systems at work when we modalise;
- (D3): following D1 and D2, one must be anti-realist about modality.

First, D1. No doubt, the relevant modules/systems are carrying the epistemic load in my naturalised modal epistemology—that’s why the epistemology is reliabilist. What I have achieved in this dissertation is that cognitive-architectural constraints on perceptual and imagination systems, which are at work when we modalise, can illuminate the epistemic reasons we have for holding modal beliefs. That is, perceptual and imagination systems only help us to appreciate what good epistemic reasons for modal beliefs are. Psychology doesn’t tell us what counts as good or bad epistemic reasons; that’s epistemology’s job. But psychology can help us see how we are able to appreciate (being responsive to some) epistemic reasons. In fact, if psychology someday comes good on what the nature of representations of facts is in the brain, we might be able to appreciate why we are resistant to some epistemic reasons, and why some philosophers are resistant to the empiricist analyses of modal justification. In short, my naturalised modal epistemology only takes psychology to be instrumental to modal epistemology.

Modal epistemology still concerns facts that are real, and their reality doesn’t mean we can’t explain, using the relevant scientific findings, how we come to have beliefs about such realistic facts, whether or not our beliefs about them are justified. Thus, we can respect the intuitive sense in which it isn’t the function of anyone’s psychology that ‘ $2+2 \neq 5$ ’, yet explain how we come to have beliefs that ‘ $2+2 \neq 5$ ’ using facts about our psychology. Consequently, I also endorsed a moderately psychologicistic framework (section 1.1), to sustain this intuitive sense in which some modal facts aren’t the function of our psychology. How is my naturalised modal epistemological theory moderately psychologicistic, then? By not taking all questions about modal epistemology to be psychological questions. The opposite of this is what D1 says. But that isn’t true according to

my naturalised modal epistemology. That my naturalised modal epistemology builds on cognitive-architectural constraints on perceptual and imagination systems doesn't mean that the systems determine the field of modal epistemology. What perceptual and imagination systems determine are our credence regarding the epistemic reasons we have for modal beliefs. To reiterate, I only take psychology to be instrumental to modal epistemology. Thus, D1 isn't met.

Second, D2. Do perceptual and imaginative systems determine what is correct or incorrect in modal epistemology? A straightforward answer follows immediately from the clarification of D1, but this answer also requires clarification. The straightforward answer is this: "What perceptual and imagination systems determine are our credence regarding the epistemic reasons we have for modal beliefs." But it can be argued that, if perceptual and imagination systems determine our credence about the epistemic reasons we have for modal beliefs, then such credence had better not be arrived at through reliance on the systems. This is what Pelletier and collaborators mean when they say that "if the field of [study] is determined by the workings of the [relevant] module, then the notion of an error becomes quite dicey ... it seems impossible for there to be error, since by hypothesis all people act in accordance with their architectures and the architectures define normativity. How then, can some people 'get it right' while others 'get it wrong'?" (2008: 46 and 48). But I think this challenge can be quickly dealt with.

Even though my naturalised modal epistemology is cognitive-architecturally based, it explains how epistemic agents get modalising right or wrong. My modal psychology isn't an infallible account of modal justification. I will reiterate how PMJ and IMJ individually achieve this. First, PMJ: In section (2.4.2), after defending PMJ, I explained that the BM-beliefs of an epistemic agent may be unjustified if, for instance, the beliefs are cognitively penetrated by expectations. Here is what I said: "If, by *wishing* that I am an expert rock climber, I perceptually believe that 'the famed El Capitan 900m vertical rock surface is climbable by me', then my BM-belief is intuitively *prima facie* unjustified. That I can climb the El Capitan's surface shouldn't be justified by my expectation. Expectations do not make things happen, and I surely won't be able to climb the El Capitan's surface just because I wish I can."

Second, IMJ: In section (3.3.1), in the course of defending IMJ, I explained that an epistemic agent can err in how she imagines a certain scenario, since she is being judged for consistency based on her own epistemic possibilities. Here is what I said: "If you and I are reasoning about zombies, and we are using words like 'consciousness' in some physicalist sense, then my imagination that 'zombies can feel pain' will come out defective. Pain can be felt if consciousness is defined in physicalist terms, whereas, zombies are only possible if consciousness isn't defined in physicalist

terms. Bringing these two together is indicative of a contextual shift, and contextual shifting in imaginative acts violates the principle of adjunction and simplification, which the logic of imagination prohibits.”

Thus, even though evidence for modal beliefs is clarified by the constraints on perceptual and imagination systems, it is clear that epistemic agents can err about whether or not their modal beliefs are justified. Cognitive-architectural constraints may play necessary roles in modal justification, but we can certainly explain how some epistemic agents get modalising right and how some get it wrong. Error isn’t dicey at all by my naturalised modal epistemological accounts. I take this analysis to be plausible, because Pelletier and collaborators leave room for it: “We wonder if this self-verifying circularity is simply inherent in any cognitive architecture position, at least as we have defined it here” (2008: 46). Cognitive-architectural constraints may play necessary roles in modal justification, but they don’t determine what is correct or incorrect in modal epistemology. D2 is avoided.

In sum, my naturalised modal epistemology doesn’t meet D1 and D2. But, if so, then D3, as it is relevant to our purposes, isn’t also met, since, for us, D3 follows from D1 and D2. That my naturalised modal epistemology builds on cognitive-architectural constraints doesn’t mean that it is anti-realist about modality. This is one reason I earlier said (section 1.1), that being anti-realist about modality involves too much psychologism. In fact, I think an epistemology of modality that operates with an anti-realist metaphysical framework would be susceptible to a category mistake. This explains why I think Heras-Escribano’s anti-realist (or non-realist) construal of affordances (section 4.2.2) leads one to a category mistake—it hyper-intellectualises affordances by removing it from a metaphysical category to a semantic one. In short, my naturalised modal epistemology isn’t psychologistic. But if it isn’t psychologistic, what is it? I have said it is moderately psychologistic, and I have clarified what this entails when I discussed how my naturalised modal epistemology doesn’t meet D1. But since, generally, terming a theory ‘psychologistic’ elicits an undesirable connotation among philosophers, let us shed the terminology completely.

In section (1.3), I explained that there, at least, three forms of naturalised modal epistemology—modal psychology, modal linguistic, and scientism. Briefly, modal psychology attempts to naturalise modal epistemology by considering the psychological underpinning of modalising; modal linguistics and modal scientism attempt to do the same by considering the behaviour of modal terms in our natural languages, and by considering the role modality plays in scientific theorisations, respectively. In principle, all three forms can be termed psychologistic, since modality would become, by their standard, a function of our psychology. Thus, for a theory of



naturalised modal epistemology not to be psychologistic, it must be clear on how it won't be. I have been clear. I have said I do not think all traditional problems of modal epistemology are psychological problems. Rather, I think psychology can illuminate some traditional problems of modal epistemology. Thus, I take my naturalised modal epistemology to be psychological not psychologistic. Only a psychologistic theory would meet D1 to D3; a psychological theory need not meet any.

This, then, is the guiding principle my naturalised modal epistemology conforms to: If by probing our psychology we discover that the alethic modalities that are illuminated by such psychological investigations are those that modal realism countenances, then we have a plausible empiricist account of modal epistemology that doesn't offend against the reality of some modal facts.<sup>6</sup> Hence, I am a realist about modality, but I have been careful not to allow my realist assumptions to interfere with my arguments in this dissertation; neither have I relied on them. One reason for this is that I want to engage in modal epistemology independently of modal metaphysics (section 1.1). And I take this to be a virtue of my (or any other) modal epistemology, precisely because epistemology, we were taught in our undergraduate days, is an independent branch of philosophy in every respect that metaphysics is. Modal epistemology can and should be engaged in, with the sole purpose of making sense of how we come to have modal beliefs and whether or not those beliefs are justified. And we can do this by investigating our psychology when we modalise. In short, my modal epistemology is naturalistic in that it is psychologically well-informed, but moderately so, in that it countenances modal realism.

## 4.3 Objections

I have discussed the objections that PMJ and IMJ individually face in their respective chapters, and I have just clarified some obscurities about each of them (sections 4.2.1 and 4.2.2). But I haven't discussed the objections that they might collectively face; i.e., I haven't discussed the objections that modal psychology as a research field might face. Since modal psychology seeks to investigate some traditional modal epistemological problems from the perspective of the psychology of the epistemic agents, relevant objections would be all and only those that make psychological claims about our competence for making modal judgments.

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<sup>6</sup> See section (1.3) for a distinction between empiricism and naturalism. As a brief reminder: all naturalists are empiricists, but not all empiricists are naturalists.

This streamlines the list of putative objections. For instance, van Fraassen's (1980) scientific anti-realism about modality drops out, since his modal scepticism isn't psychologically-oriented. But I concede that there is a sense in which van Fraassen's position conflicts with what I have said in this dissertation, such that not discussing him may come off as evasive. Van Fraassen prides himself as an empiricist (this is, arguably, one reason he calls his position 'constructive *empiricism*'), and he thinks being an empiricist about modality comes with rejecting anything that isn't observable. Electrons, modality, and anything unobservable are fair game. One can say, then, that he takes the Humean metapsychological thesis for granted, in that he takes experience to be exhausted by the actual. We should be sceptical about anything non-actual. Thus, the epistemology of unobservable entities<sup>7</sup>, as given by van Fraassen, even though non-psychological, conflicts with my modal psychology, and this conflict may require that I give him a detailed response, but I won't get into such detail here.

This is because, if the main arguments of my modal psychology are correct; i.e., if the Humean metapsychological thesis is false, if experience isn't exhausted by the actual, and if perception and imagination play necessary roles in the justification of modal beliefs, then *pace* van Fraassen, being an empiricist doesn't come with the requirement of rejecting anything or everything that isn't observable. Simply, the modal psychology I embarked on in this dissertation presents an alternative picture to what we would get if we take experience very seriously. This way, Hume (and some of his empiricist precursors), van Fraassen, and perhaps anyone who wants to get to modal scepticism from taking experience seriously must be cautious of the entailment they draw from experience. If what I say in this dissertation is correct, then taking experience seriously gets us to an empiricist account of modal justification, rather than to modal scepticism, and this alternative picture is worth having. After all, if we are to take experience very seriously, then we must embark on some psychological investigations, or, at least, listen to what the psychological studies of experience are saying (see section 2.4.2). None of those who wants to get to modal scepticism from taking experience seriously have done this. I have. This alternative picture that my analysis provides should, therefore, be taken more seriously than what Hume, his empiricist precursors, van Fraassen, and others are saying.

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<sup>7</sup> Ladyman clarifies that constructive empiricism is more an epistemological theory than a metaphysical one. He writes: "constructive empiricism is fundamentally a view about the aims of science and the nature of 'acceptance' of scientific theories, rather than a view about whether electrons and the likes exist" (2000: 839). In fact, he concludes that being a constructive empiricist comes with some modal commitments, such that it can't be correct that constructive empiricism denies the reality of modality. But, see Monton and van Fraassen (2003), for why Ladyman gets things wrong, and how being a constructive empiricist doesn't come with any modal commitments.

Even though van Fraassen doesn't make psychological claims about our experience of modality, there are others that do. Most notably, Nozick's (2001) psychological/evolutionary scepticism about necessity, and Blackburn's (1987) antinaturalism about necessity.<sup>8</sup> Since these objections are psychologically-oriented, they directly block the main arguments in this dissertation, and, so, I will focus on them in this section. I will address Nozick's challenge in section (4.3.1), and Blackburn's challenge in section (4.3.2).

### 4.3.1 Nozick's Scepticism about Necessity

Robert Nozick's (2001) scepticism about necessity comprises psychological, evolutionary, and metaphysical arguments. The psychological and evolutionary arguments are linked, and since I want to focus on only psychological objections, I will be concerned with his psychological and evolutionary arguments in this section. Another reason I will skip his metaphysical arguments, even though they shed light on the psychological and evolutionary ones,<sup>9</sup> is that I want to separate modal epistemology from modal metaphysics in this dissertation. In what follows, I will consider his psychological and evolutionary arguments concurrently, although, they can be separated if given due attention.

Nozick begins by saying that the move from countenancing some truths as necessary to a notion of metaphysical necessity is unmotivated. And since this is how most philosophers arrived at the notion of metaphysical necessity in the first place, one straightforward way to undermine the notion is to ask how philosophers come to know whether any truth is necessary. He writes: "I am sceptical about the extent of necessary truths, and about their status. And I shall maintain that there are no interesting and important metaphysical necessities" (2001: 120). So, how do philosophers know that some truths are necessary? Nozick responds: "A general statement *S* will be a candidate for being a necessary truth when it is, so far as we know, true, and we do not see how it could be false. We test its candidacy for necessity by trying to think up counter-examples to *S* ... If strenuous efforts by ourselves and others fail to find such a possible counterexample, we tentatively conclude that *S* is a necessary truth" (2001: 121). Disagreements about the necessity of a truth, he argues, ensue from debates about the possibility of putative counterexamples.

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<sup>8</sup> That these objections are directed only toward necessity may make one ask: What about possibility? Is it, unlike necessity, immune to psychologically-oriented scepticism? It is difficult to give a general answer to this question. This is because, while there are those who think that the notion of modality, in general, is suspect (e.g., Quine 1966, 1970), there is little doubt that making possibility statements is part of our basic linguistic and cognitive repertoire. See Fischer (2017) for an epistemology of ordinary possibility claims. As a result, there isn't much psychologically-oriented scepticism about our competence for making possibility judgments.

<sup>9</sup> For instance, he argues at length, using possible-world semantics, against the Kripke-Putnam necessity of water's being H<sub>2</sub>O, the necessity of origin, the necessity of rigid designation, and so on.

This, in Nozick's view, shows that what is necessarily true is just what can't possibly be false: "We might construe this inference as an inductive one. (All the possibilities we have examined fit *S*; therefore, all possibilities do.) Or we might construe it as an inference to the best explanation. (The best explanation of why we have failed to find a possibility where *S* is false is that there is no such possibility.)" (Nozick 2001: 121). This, for him, shows that the claim that the cognitive faculty we most certainly have, is the one that helps us directly assess some possibilities, but not all of them. He writes: "A roughly accurate faculty for generating or imagining possibilities might have served our ancestors well in deciding upon actions, but there would not have been selection for a faculty powerful enough to generate *all* logical possibilities" (2001: 122, original italics). More importantly, if we press this evolutionary argument further, Nozick argues, we can explain why we standardly take necessity as exhibiting the strongest sense of invariance.

In Nozick's view, we take necessity as exhibiting the strongest sense of invariance because evolution has, over time, perhaps through the Baldwin effect<sup>10</sup>, hardwired us to see what we regard as *self-evident* to be 'necessary'. But he writes: "Something's seeming self-evidently true to us does not guarantee that it ever was, strictly, true. Consider, by analogy, what we now say of Euclidean geometry: that it is true enough for almost all practical purposes, that it is undetectably different, in the small, from spaces of small curvature, but that, strictly, it is not true (of, as we say, "physical space")" (2001: 124). Consequently, he takes this argument to explain away the necessity of many truths, even logical and mathematical ones: "According to [this] evolutionary explanation, some general truths (or propositions close enough to the truth), although themselves contingent, would be instilled to have the patina of necessity ... To explain why such principles seem self-evident to us, one need not invoke their necessity" (2001: 142 and 125).

It is clear from the way Nozick sets things up that much about his psychological/evolutionary argument turns on us lacking a faculty with which we can directly assess the necessity of some truths. Recall that our disagreements about the necessity of some truths arise because we doubt the possibility of some putative counterexamples. These disagreements, he stresses, "would be avoided if we possessed a faculty of reason that could directly assess the possibility of general statements and of their denials ... However, we do not appear to have such a faculty, and it is implausible that evolutionary processes would instil that within us" (2001: 122). This would be detrimental to my modal psychology were it true, for my modal psychology seems to imply that we have faculties with which we can directly assess basic and philosophical necessity. But not only

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<sup>10</sup> The Baldwin effect is, roughly, an evolutionary mechanism which transforms a culturally invented and acquired trait into an instinctive trait by the means of natural selection (Baldwin 1896; Godfrey-Smith 2003).

is Nozick's position not true, we need not have any such faculty for directly accessing either basic or philosophical necessity. I will begin with how Nozick's position isn't true, then segue into how we need not have necessity-sensitive faculties.

I think we can dismiss Nozick's position outright. There are many things we do, for which we lack cognitive faculties. For instance, we compose symphonies, yet there is no faculty for music composition; we write fantastical novels, yet there is no faculty for writing books; we do sophisticated Euclidean and non-Euclidean geometrical calculations, yet there is no geometry module. Let me use this example of geometry to make my point. In section (4.2.2), I explained that geometric cognition is now regarded as the product of some basic spatial cognitive capacity (e.g., Spelke et al. 2010), as against being the outputs of a geometry module (see, Cheng 1986). I also explained that the transition from this basic spatial capacity to geometry wasn't the achievement of any single individual, but of a community that jointly constructed, explored, and reconfigured spatial representation tokens (Hohol and Milkowski 2019). Put simply, despite our lack of a geometry module, our basic spatial cognitive capacity already got us into the game of geometric reasoning.

Our basic capacities need not deliver the whole thing, insofar as those extra add-ons, whatever they might be, aren't pivotal for survival. Sophisticated geometric reasoning is certainly not pivotal to survival,<sup>11</sup> and, so, our basic spatial reasoning need not be able to deliver it. In short, evolution need give us only the basic capacities to get us into the game, and all other sophisticated (and sometimes alienated tasks, like geometric reasoning, which has become alienated from the perspective of our basic spatial reasoning) tasks that such basic capacities lay the foundation for, can be achieved through cultural innovation and shared technology (Dennett 1996).

In this way, our possibility faculty, which Nozick doesn't deny that we have, already got us into the game of modalising. Evolution has already given us the basic tool we need to get into this game, and our social interaction can get us all the way to necessity. (In a sense, Nozick's error is of the same species as Nichols' (2006a) scepticism about whether imagination is a good guide to absolute modality, which was addressed in section (4.2.2).) In short, we need not have any faculty for directly assessing necessity independently of the one we have for assessing possibility. In fact, nothing in my arguments in this dissertation implies that we do. The same cognitive faculties—

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<sup>11</sup> Compare our basic capacity for sugar digestion. Even though it is basic, it has to deliver the whole package; i.e., helps us identify which food is rich in sucrose and its ilk, and which food isn't. If it fails to deliver this add-on, we die off. Modalising isn't like this; we certainly won't die if we stop to modalise. Quine certainly thinks we can and should. Modalising is more like geometry and music composition. It is an add-on, which the basic capacity that got us into the game of modalising need not deliver.

perception and imagination—I argued, are our epistemic access to basic and philosophical modality, respectively. This is plausible because, take perception, for instance: From an evolutionary point of view, our ancestors’ ability and success to perceptually tell the difference between a tree-branch that *can* hold them and one that *can’t* hold them was pivotal to their survival, such that getting from this possibility notion to a notion of proto-morality about what can and can’t be done isn’t so far-fetched (see, e.g., Garvey 2018), and from proto-morality, a notion of necessity is just by the corner. Williamson (2007, 2016a, 2016b) has been hawking versions of this idea for a while now.

In sum, the relationship between evolved cognitive faculties and our cognitive achievements leaves room for the kind of transition that got us from basic spatial reasoning to geometric reasoning, without the need for a geometry module. A similar transition for modalising could as well have been made available by evolution, without the need for a necessity faculty, since evolution already gives us the basic tool we need to start modalising; namely, our possibility faculties. To reiterate: evolution already gives us the tool we need to access possibility (perception and imagination, for example), such that we don’t need a separate faculty to access necessity; perception and imagination, though evolutionarily designed for directly accessing possibility can get us all the way to necessity. I take this to be a *reductio* of Nozick’s scepticism about necessity. For, if it is correct, then it takes geometry, music composition, book writing, and many other things we do and for which we lack cognitive faculties, down with it.

#### 4.3.2 Blackburn’s Anti-naturalism about Necessity

Over the years, Simon Blackburn has pushed for a project he calls *quasi-realism*, which he claims offers plausible treatments of a range of philosophical topics. Quasi-realism, as he explains it, takes anti-realism seriously by rejecting the existence of a third realm, but it retains the explanatory power of realism. This, he says, generates a mid-way between realism and antirealism: “This result accords with what I call ‘quasi-realism’, for it is another respect in which someone who approves of the anti-realist instinct over the priority of truth or virtue still ends up with the very thoughts that the realist took for his own” (Blackburn 1987: 48).<sup>12</sup> Quasi-realism, therefore, becomes a pragmatic program, asking “broadly anthropological questions: How are we to understand the roles and functions of the behaviour in question, in the lives of the creatures concerned? What is its practical significance? Whence its genealogy?” (Macarthur and Price 2007: 95).

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<sup>12</sup> All references to Blackburn are from his (1993) work, but I retain the original date of the published papers reprinted in that (1993) work. Where I reference his (1993) directly, I refer to the introduction of the book.

Modal quasi-realism is Blackburn's attempt to apply his quasi-realist project to modality. According to him, one of the inevitable consequences of modal quasi-realism, is that absolute necessity<sup>13</sup> cannot be naturalistically explained. This is because when we run modality through the pragmatic and anthropological questions that quasi-realism asks, we see that the whole point of modalising is to vary our beliefs with circumstance. That is, modalising helps us make sense of the constant changes in our knowledge as we interact with the world, and since this is beneficial to our overall social and cognitive life, we have evolved to effortlessly and non-collusively modalise. This mental act Blackburn calls *make something of*, and he defines it thus: "Here 'make something of' will include being able to explain how such a way of thought might arise, knowing how it might be rectified, understanding the practices of those whose thought it is, and so on" (1987: 66). 'Make something of', therefore, captures the pragmatic and anthropological spirit of modal quasi-realism, such that much about modal quasi-realism turns on the idiom.

The relevant question then is this: How does 'make something of' lead Blackburn to his anti-naturalism about necessity? In his view, 'make something of' gives us a sense of what counts as recalcitrant experiences, the kind we can't provide pragmatic and anthropological answers for: "And, given that there is a residual class of apparent beliefs where he cannot [make something of them], he will have a working substitute for the necessary and the impossible" (1987: 66). This way, 'make something of' constitutes the essence of naturalisation in modal epistemology: "naturalised [modal] epistemology is largely a study of the variation of belief with circumstance. It can be done by us only when we can *make something of* the variation of belief involved. In some cases, we can; in residual cases such as logic and mathematics we characteristically cannot. This difference can be used naturalistically to explain our tendency to make modal divisions" (1987: 66, *my italics*).<sup>14</sup>

To make something of a necessarily true belief, he argues, we must be able to bring ourselves to understand how things would be were the belief false; i.e., we must be able to vary the belief with circumstance. For instance, to make something of  $1+1 \neq 3$ , we must be able to bring ourselves to understand what it would be for  $1+1=3$ ; i.e., think the other side of the boundary. Blackburn writes: "when someone says 'if  $1+1=3$  then . . .' and essays to show how, if this were true, we would be in a bad position to appreciate it, the thought experiment breaks down, for we cannot properly work through what is being supposed and how we might be in a world of which it is true"

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<sup>13</sup> Despite their differences (see section 1.4), I have said (fn. 4, above) that I will take absolute and philosophical modality to be one and the same thing in this chapter.

<sup>14</sup> These 'residual cases', he explains, mark an asymmetry between moral necessity and absolute necessity. Moral necessities lack this recalcitrant nature: we can make something of both what is morally contingent and necessary.

(1987: 71). As he explains it, we are unable to do this precisely because the imaginative block we face when we endeavour to do so, is not a contingent fact about us: “But it goes a little further, for in the light of what we have said, it will also be so that we cannot see the incapacity as *just* one we happen to be subject to; we cannot deem it a *mere* fact about ourselves, here, now” (1987: 71, original italics).

Necessity has to be resistant to naturalistic explanations for it to remain a good candidate for modal commitment, he concludes: “In the case of the modal, the phenomenon is antinaturalistic at its core” (1987: 72). And it is in this anti-naturalism that absolute necessity is *necessary*, according to Blackburn: “On this account, part of what it is for us to make nothing of the truths that we deem impossible is that we cannot explain naturalistically our own failure to see what it would be for them to be true. When we can see how, if a proposition were true, we might nevertheless be in bad circumstances to appreciate how it might be, we release it from impossibility. It does not deserve ruling out anymore” (1987: 70). If this anti-naturalism about necessity is correct, then the prospects of modal psychology should be limited to possibility. In which case, most of what I have said in this dissertation, particularly regarding philosophical necessity, is false. But Blackburn’s anti-naturalism about necessity doesn’t tell the complete story. Nichols (2006a) shows why.

Nichols thinks that, “*Pace* Blackburn, a naturalist might be able to explain why we have an imaginative block against the proposition  $1+1=3$  without being able to make anything out of thought that  $1+1=3$  might be true” (2006a: 247). Nichols uses the single code hypothesis. As discussed in section (3.4.1), the single code hypothesis concerns any mechanisms that takes representations from both the imagination box and the belief box as inputs. The hypothesis is that for “any mechanism that takes input from both the [imagination] box and the belief box, the [imagination] representation  $p$  will be processed much the same way as the belief representation  $p$ ” (2006a: 249). Consequently, the reason we face imaginative blocks when we endeavour to think how a patent contradiction can be true, according to Nichols, is a consequence of the single code hypothesis. He writes: “On the single code hypothesis, this block is explained by the fact that the [imagination] representation that  $p \leftrightarrow \sim p$  would engage our normal inferential systems. And just as our inferential systems would expel the belief representation  $p \leftrightarrow \sim p$ , so too do they expel the [imagination] representation that  $p \leftrightarrow \sim p$ ” (2006a: 250). If so, then ‘make something of’ doesn’t seem to capture the essence of naturalised modal epistemology.

Nichols’ explanation seems largely correct to me, because it is exactly the kind Blackburn demands, in that it relies on facts about our psychology. But we can envisage that Blackburn might take Nichols’ strategy to sideline ‘make something of’, as vindication that we can’t, after all, make



anything of necessity. That, despite having a naturalistic explanation for the imaginative blocks that issue judgments of absolute modality, we still can't entertain a way of thought where  $1+1=3$ . Yes, Nichols has said we are not obliged to understand such a way of thought—that explaining how the blocks arise is what matters. But Blackburn may persist that an explanation of why the blocks arise is insufficient; that we must, at least, be able to explain why our inferential systems rebel at patent contradictions, and this would, in some way or other, involve understanding a way of thought where patent contradiction is true. Recall that he thinks he's not being unduly pessimistic because, "Eventually we voice an inability to make anything of transgression against the norms ... we suppose essential to any scheme of thought (such as some distinction of truth and falsity, some stability of content, some embargo on contradiction)" (Blackburn 1987: 72). Our inability to explain why our inferential system rebel at patent contradictions, then, he would say, is part of the final surd that remains, and, as we have seen, he takes the necessity of absolute necessity to consist in the incorrigibility of this remaining final surd.

Similar problems combat any response to Blackburn that is silent about 'make something of' like Nichols'. For instance, one can argue that since 'make something of' is essentially psychological, it is only implicated in modal psychology, but not in modal scientism and modal linguistics. Recall that modal psychology, modal linguistics, and modal scientism are the three forms of naturalised modal epistemology (section 1.3). Modal psychology attempts to naturalise modal epistemology by considering the psychological underpinning of modalising. Modal linguistics and modal scientism attempt to do the same by considering the behaviour of modal terms in our natural languages, and by considering the role modality plays in scientific theorisation, respectively. But, despite this specification of the aspect of naturalised modal epistemology where 'make something of' is implicated, Blackburn could respond that his anti-naturalism carries through in both modal linguistics and modal scientism as well.

Blackburn could say that making sense of our use of modal language presupposes making sense of the mental states involved in modalising, such that if there is a problem in naturalistically explaining states of not being able to make anything of a necessity claim, then those problems would resurface in modal linguistics also. Similarly, for modal scientism. Blackburn could also give an account of the role modality plays in science quasi-realistically. He could say that when we treat some scientific claims as objectively necessary, we would be regarding the world as such that we cannot make anything of such necessary claims being false, independently of what any agent may think. Thus, it would be problematic to explain naturalistically the states involved in treating a scientific theory as involving necessary truths. He would insist, ultimately, that 'make something of' shines through in both modal linguistics and modal scientism.

What is needed, then, is not being silent about or explaining away ‘make something of’, but to show, despite the implications of ‘make something of’ that naturalistically explaining a necessary truth doesn’t thereby render the truth contingent for us. This is because the reason Blackburn could press on, despite this tack of explaining away ‘make something of’, is that the tack doesn’t address what seems to be Blackburn’s main concern. To reiterate, his main concern is that naturalistically explaining necessity would render the necessity contingent for us.<sup>15</sup> But this concern can be addressed by way of a clear and uncontroversial example—squaring the circle. Squaring the circle is an absolute impossibility, which, even though it has become explicable, has not in any way become contingent for us. Let me run through a brief history of the problem and what lesson we can learn from it regarding Blackburn’s anti-naturalism about necessity.

To square a circle, one would have to use only a compass and straightedges, and construct, for any given circle, a square with the same area as the circle. Since the earliest days of mathematics<sup>16</sup>, renowned mathematicians like Anaxogoras, Euclid, Archimedes, Leonardo da Vinci, and Descartes, to mention but a few, laboured inexorably to square the circle.<sup>17</sup> But we have had proof, since the late 19th century, that this task is impossible, thanks to the knowledge that  $\pi$  is a transcendental number; i.e.,  $\pi$  cannot be a root of any algebraic equation. The transcendence of  $\pi$  proved monumental in deciding the impossibility of squaring the circle, because how to determine whether a proposed Euclidean problem is possible or not has been established. For a proposed Euclidean problem to be possible, each of the data of the problem must be a root of one algebraic equation or other. In the case of squaring the circle,  $\pi$  features as one of the data of the problem, and, since  $\pi$  cannot be a root of any algebraic equation, squaring the circle is not determinable by Euclidean construction.

Despite this explanation for why squaring the circle is absolutely impossible, Blackburn might press on that the explanation doesn’t rely on any psychological fact about us, and, so, it doesn’t count as a naturalistic explanation. But, should he make this move, he would be committing an error of the same species as Nozick (section 4.3.1). Blackburn would be saying that the only way an epistemology of mathematics can be psychological is for it to rely on some phylogenetic or

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<sup>15</sup> Traces of this can be seen in Nozick’s objection also. He argues that metaphysical/absolute/philosophical necessity is vacuous because it depends on schemes of thoughts, and, so, is contingent. This is one of the metaphysical arguments he gives for his scepticism about necessity, which I skipped. For a discussion of his psychological arguments, see section (4.3.1).

<sup>16</sup> At least, one source (Hobson 1913) traces the first appearance of the problem to the Papyrus *Rhind* (ca. 1650 B.C.E.), which is preserved in the British Museum.

<sup>17</sup> See Fletcher (2007) for a review of the different approaches used over the years in trying to square the circle.

ontogenetic facts about our psychology. But this, as I have already made clear (sections 4.2.2 and 4.3.1), is no longer the standard view about mathematical cognition: “The typical view in cognitive science is that mathematical cognition should be studied as a purely individual achievement. In contrast, we point out that mathematical justificatory practices may be understood in terms of repeatable public procedures that rely on the capacities of cognitive agents to jointly construct, explore and reconfigure representational tokens” (Hohol and Milkowski 2019: 2).

Under this construal, this sort of explanation, which we now have for why squaring the circle is absolutely impossible, will count as psychological in all relevant senses. Yes, the explanation doesn’t rely on any phylogenetic and ontogenetic psychological facts, but it relies upon some *cognitive artefacts* that have become reified in our evolutionary history, perhaps through the Baldwin effect<sup>18</sup>, where cognitive artefacts are entities that “maintain, display, or operate upon information in order to serve a representational function and that affect human cognitive performance” (Norman 1991: 17). As things stand, a plausible account of the evolution of mathematical cognition relies on cognitive artefacts (e.g., Gureckis and Goldstone 2006; Clark 2006; Hohol and Milkowski 2019). Our psychology has been constrained by the relevant cognitive artefacts in such a manner that, had we evolved outside the cognitive niche structured by the artefacts, we wouldn’t have the same mathematical cognition that we now presently have. If this is not a psychological explanation, then I don’t know what is. But, if it is psychological, then it qualifies in all relevant aspects as naturalistic.

If the above is correct, then we have a naturalistic explanation for why squaring the circle is absolutely impossible, and we do not thereby lose our right to regard squaring the circle as necessarily so. No one who understands why squaring the circle is absolutely impossible, in the manner adumbrated above, now claims as a result of that understanding, that squaring the circle has become contingent for them. No one can square the circle; it is pointless for anyone to try. But Blackburn might respond that, even though it is impossible to square the circle, anyone can now utter this counterfactual: “... had  $\pi$  been a countable and rational number, we would have been able to square the circle”. And that, since this is just what variation of belief with circumstance entails, the counterfactual captures an imaginable scenario where squaring the circle is possible. Even so, this doesn’t reduce the force of my argument. For not only is this counterfactual sound reasoning (at least, by the standard of paraconsistent logic), everyone, Blackburn included, agrees that we do this sort of reasoning all the time.

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<sup>18</sup> See fn. 10, above, for a rough definition of the Baldwin effect.

For example, Blackburn writes: “Some relief might be got by teasing out more aspects of the core inability to ‘make anything of’ a way of thought that accepts a putative impossibility. Obviously, there are enterprises of thinking through what modifications in logic are possible or what would be missing in a way of thought that consistently tried to make  $1+1=3$ ” (1987: 72). Despite this caveat, I doubt that the counterfactual really captures a scenario where squaring the circle is possible. Perhaps what Blackburn has in mind is not that squaring the circle would become nomologically possible for his character, but only epistemically so. But that isn’t what we mean when we rule out a scenario as *absolutely* impossible. We certainly just don’t mean that  $1+1\neq 3$  in an epistemic sense—as we have seen, paraconsistent logic allows it, and even Blackburn agrees that we can have substantive discussion about a way of thought that countenances  $1+1=3$ . Rather, we also (if not, specifically) mean that  $1+1\neq 3$  in a nomological sense. No one *can* construct using only a compass and straightedges for any given circle, a square with the same area as the circle

What is important then, is that, even though the counterfactual above is meaningful, it still doesn’t render squaring the circle contingent for anyone. Again, not even Blackburn’s character who can utter the counterfactual can square the circle. To reiterate: no one can, and it is pointless for anyone to try. But if the counterfactual doesn’t render squaring the circle contingent for us, then by Blackburn’s standard, it only captures an imaginable scenario which has the patina of varying beliefs with circumstance. We aren’t really varying the belief that ‘squaring the circle is possible’ with circumstance, because we can’t understand a way of thought that builds on such possibility. In short, we aren’t really varying the belief with circumstance because we can’t make something of how squaring the circle is possible.

Thus, we can agree with Blackburn that we can’t make something of necessity but disagree that ‘make something of’ captures the essence of naturalised modal epistemology. Our tack for arriving at this conclusion would, however, be an improvement on the one taken by Nichols. Recall that, despite Nichols’ success in showing how naturalistic explanations can be given without ‘making something of’, Blackburn could counter that Nichols doesn’t address why our cognitive mechanisms rebel at patently contradictory representations, and this allows Blackburn to maintain that the final surd would remain, or else necessity becomes contingent for us. I explained that this last part—the remaining final surd which seems to secure the necessity of necessary truths—seems to be Blackburn’s main concern. However, if by showing that no final surd remains in some cases where we have naturalistic explanations for absolute necessity, as above with the case of squaring the circle, then Blackburn’s main concern is explained away. At least, in the case of squaring the circle, absolutely necessity does not become contingent for anyone because we have naturalistic explanations for why squaring the circle is absolutely impossible.

The way I see it, Blackburn wants to retain a ‘brute fact’ element for absolute necessity, but I don’t think absolute necessity owes its necessity to such an element. Not unless other kinds of necessity lose their necessity if they lose or lack this brute-fact element, which they don’t. There are at least five kinds of necessity—epistemic, nomological, deontic, conceptual, and metaphysical—and only metaphysical or absolute necessity seems to stand or fall with this brute-fact element. Everyone seems to agree that the epistemic, nomological, and deontic kinds of necessity do not have such an element at all. The conceptual kind seems to have it, but no one bats an eye when it is explained away. For instance, in section (1.1), I explained that Lewis (1969) rejects the idea that analyticity adequately captures necessity, yet no one cries foul. Thus, only metaphysical or absolute necessity, to the extent to which mathematics and logic are classified as such, seem to have this element. But, if all other kinds of necessity lack a brute-fact element, and we do not thereby lose track of their necessity, then there is no apparent reason why we must enforce a stance that ties the nature of absolute necessity to it. This seems to be Nolan’s (2011) point in his argument that absolute necessity is, in fact, a species of restricted modality.

Blackburn might respond that it is precisely because other kinds of necessity *can* lose this brute-fact element that makes us intuitively take them to be of lesser degrees than absolute necessity. But this would be question-begging. What needs elucidation is why we must hold onto the brute-fact element. So, the brute-fact element can’t be presupposed in explaining why absolute necessity is of a higher degree than other kinds of necessity. I do not claim to know what makes absolutely necessary truths necessary, but I doubt that they lose their necessity if they lose the brute-fact element that we associate with them. Certainly, the brute-fact element is lost if we now have naturalistic explanations for absolutely necessary falsehoods or truths, in that we can see how they falsehoods could be otherwise, even if what we can now see only has the patina of being otherwise. Nonetheless, there’s no apparent reason to move from the loss of this brute-fact element to a loss of the involved necessity.

Probing our psychology may yield the knowledge of why absolutely necessary truths/falsehoods are necessary, but this doesn’t mean we would lose our right to regard them as necessary as a result of possessing such psychological explanations. Also, it doesn’t mean we should give up trying to find such psychological explanations for fear of losing our right to regard absolutely necessary truth/falsehoods as necessary. In short, even though we can’t make anything of absolute necessity, modal psychology, as Nichols argues, isn’t defeated. Not only can we give a naturalistic explanation for the imaginative blocks we face when we try to make something of an absolutely necessary claim, à la Nichols, we can also show that such explanation may not come with the forfeiture of the necessity of the claim.

## 4.4 Implications

Modal psychology is a relatively novel area of research in the philosophy of modality (section 1.4). In fact, according to Nichols (2006a), who coined the term, philosophers ought to place modal psychology on a par with modal metaphysics and modal epistemology, and not treat it as a shameful relative of the duo. But almost two decades have gone by since his trail-blazing account and modal psychology is not close to being fully established as a philosophical enterprise. The way I see it, the two most important stumbling blocks are: firstly, a dearth of contents for modal psychology, and, secondly, the assumption that any plausible research in the philosophy of modality must engage some metaphysical machinery, particularly the possible-world semantics.

Since modal psychology is a relatively novel area of research, it isn't surprising that the literature is not replete with different accounts of modal psychology. In fact, as far as I am aware, Nichols' (2006a) is the only substantive account of modal psychology on offer. The account leaves much uncovered, however. Particularly, it concerns only the characterisation of the psychological source of our modal intuitions, from which harder questions about modality, like why we encounter imaginative blocks when we entertain the truth of necessary falsehoods (section 4.3.2), can be explored. While it does a good job on this front, there are other still harder questions about modality that it doesn't cover; for example, the question of modal justification, which has plagued modal philosophy for a considerable period.

I have tackled this problem head-on in this dissertation. In a bid to address it, I also addressed how the cognitive processes, which are often taken to feature in the etiology of modal beliefs, like perception and imagination, produce modal beliefs. These analyses of the justificatory sources of modal beliefs contribute in no small way to Nichols' trail-blazing account. I do not mean that my contribution bolsters the contents of modal psychology to such a degree that it can now be placed on a par with modal metaphysics and modal epistemology; far from it. What I mean is that my contribution certainly fosters that task. If other harder questions about modality, for instance, the problem of empirical conservativeness,<sup>19</sup> can be tackled by future modal psychological accounts, then the course of establishing modal psychology as a legitimate branch of modal philosophy would be significantly advanced.

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<sup>19</sup> The problem, as developed by McGinn (1999), is that experience cannot distinguish between modal claims, such that it is difficult to see how experience can provide evidence for one claim over the other. So, if modal empiricism is true, we ought to be modal sceptics. But, on the assumption that we shouldn't be modal sceptics, we should reject modal empiricism. However, see Fischer (2017) for a response.

By tackling the problem of modal justification, this dissertation offers a naturalistic sketch of a portion of our modal psychology. Humans clearly have cognitive processes with which they form beliefs, and these processes serve, I have suggested, as the justificatory sources for modal beliefs. Perception and imagination, I have argued, are examples of such processes. Consequently, I defended a perception-based account for the justification of BM-beliefs (Chapter 2), and an imagination-based account for the justification of PM-beliefs (Chapter 3).<sup>20</sup> The end result is a general account of modal justification that lends no support to any prominent metaphysics. No appeal to causal relations or psychological associations to possible worlds was relied upon throughout.<sup>21</sup> Rather, modal judgements were explained in virtue of cognitive processes that are metaphysically humdrum. Thus, this dissertation questions the propriety of using such metaphysical machinery to explain the justification of modal beliefs.

Granted, the theory of modal justification defended in this dissertation is novel and controversial. Hence, the widespread scepticism about the reliability of our everyday cognitive processes when appropriated in the service of modality (see sections 4.2.1, 4.2.2, 4.3.1, and 4.3.2). But the theory has something going for it that earlier traditional theories of modal justification lack. Earlier traditional *a priori* theories of modal justification do not take into consideration original empirical findings from the relevant sciences (sections 1.2 and 1.3). If perception and imagination are our epistemic accesses to modality, then we must listen to what the sciences that study them have to

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<sup>20</sup> It might be important to note a remark by Goldman (1992b), which seems to lend support to my imagination-based justification account for PM-beliefs. He agrees that a psychological account can be offered for the justification of PM-beliefs but seems to say that the only way such an account would fail is if it is an *intuition*-based account. He writes:

The problem of epistemic access to modal facts appears most pressing for an extreme realist like Lewis. Lewis claims that this difficulty is exaggerated by wrongly insisting on a *causal* account of modal knowledge ... But I do not mean to defend a purely causal theory of knowledge. I endorse a *reliabilist* account, which presumably can accommodate mathematical knowledge along with the rest. Specifically, I do not mean to require for modal knowledge that our modal intuitions causally interact with modal reality. I do insist, however, that our modal beliefs be reliably formed. If these beliefs are based primarily (or exclusively) on modal intuitions, these intuitions have to be reliable indicators of modal facts. That, however, is problematic (1992b: 64–5, original italics).

Since my psychological account is imagination-based and not intuition-based, it might get a nod of approval from Goldman, and that nod would be a colourful feather in its cap. The point here is that I haven't conjured up the idea that philosophical modality can be psychologised.

<sup>21</sup> But I clarified that I do have realist assumptions about modality. My realist assumptions accentuated my arguments in that they explain why perception could have modal contents and why imagination can get us to philosophical modality. That is, basic modality is here with us in the actual world and that is why we can perceive it, and, even though philosophical modality isn't here with us in the actual world, we can imagine it (sections 1.1 and 4.2.3). Despite my modal realist assumptions, however, the analyses I offered for the justification of modal beliefs did not rely on such assumptions.

say. The theory defended in this dissertation has so listened, and the incorporation of such empirical findings lends it significant credibility. In this way, this dissertation responds to Nolan's clarion call for doing modal epistemology for its own sake, instead of as an appendage of modal metaphysics or philosophy of mind: "Why do most come to the topic from metaphysics or the philosophy of mind? This isn't surprising if metaphysicians and philosophers of mind are the ones advancing controversial modal premises, and thus are the ones interested in criticizing or defending them" (Nolan 2017: 2).

This dissertation also achieves putting into praxis the claim that cognitive science is relevant to theoretical philosophy. While the standard approach is to take the problem of modal justification to be an epistemological problem, it can also be taken to be a metaphysical one. This might be taken to jeopardise the relevance of cognitive science to an account that aims to resolve the problem of modal justification. But there are accounts (e.g., Goldman 1992b; McCoy et al. 2019) of how cognitive science is relevant to resolving traditional modal metaphysical problems. More importantly, this relevance is not blocked even when the metaphysics is realist (e.g., Goldman 1987, 1992b, 2015). One statement from Goldman (1992b), which I quoted earlier (section 1.1), puts this balance between realist metaphysics and cognitive science aptly: "Provision of a psychological explanation [...] is obviously not a proof that there are no (*de re*) modal facts of an extramental sort. Essentialist objectivism is consistent with the availability of such explanations. Extramental modal facts might even stand in some sort of explanatory relation to the events cited in the psychological explanation" (1992b: 62).

Thus, even if modal justification is taken as a metaphysical problem instead of an epistemological one, as most rationalist epistemologies take it to be (see section 1.3), cognitive science is still very relevant to it. Otherwise put, however we interpret the problem of modal justification, either epistemologically or metaphysically, we would do better if we listen to what the relevant sciences have to say. While I have taken modal justification to be an epistemological problem in this dissertation, I have arrived at some metaphysical claims along the way. And the metaphysical claims are not just descriptive about the nature of the world, but also prescriptive and revolutionary. Recall my campaign against the Humean metapsychological thesis (sections 2.2, 2.3, and 4.2.1). Recall also, my extension of the architecture of imagination to philosophical modality (sections 3.2, 3.4.1, 4.2.2, 4.3.1, and 4.3.2). In short, what we now have in place, given the contents of this dissertation, is a picture of the world in which our natural cognitive processes are justificatory sources for modal beliefs, and cognitive-architectural constraints on the relevant processes shed light on what the justifiers for modal beliefs are. Psychologising modality leads us to a resolution of the problem of modal justification.



Thus, while the modal psychology sketched in this dissertation scarcely settles all the big questions in modal metaphysics and modal epistemology, it does hold promise for partly constraining the theoretical space, and for approaching the questions in a very different way. Modal metaphysics and traditional *a priori* approaches taken to resolve the problems in modal philosophy shouldn't be issued a carte blanche. Modal psychology can answer some of those problems and might even give better credible resolutions of the problems. We should take modal psychology seriously in matters of resolving the traditional philosophical problems of modality.

## 4.5 General Conclusion

The aim of this dissertation has been to investigate the claim that experience plays no necessary role in the justification of modal beliefs. Chapter 1 set the stage for the approach taken in this dissertation for the investigation of this claim. I explained that the reason the claim went unquestioned for a considerable period was because of the Humean metapsychological thesis, which was taken to be uncontroversially true. The thesis gave rationalist modal epistemologies a monopoly over the modal epistemological landscape. But I argued that it has been questioned in recent times, following the ground-breaking work of J. J. Gibson on the psychology of perception. Consequently, in Chapter 2, I deployed the theory of affordances, which is central to Gibson's work, to mount a challenge of this Humean thesis. Using original findings from cognitive science, cognitive neuroscience, cognitive psychology, and evolutionary psychology, I repeatedly argued that the thesis is false. To all intents and purposes, perception has inherently modal contents.

After showing that the Humean metapsychological thesis is false, I proceeded to show how perception can justify some modal beliefs. I argued that perceptual systems, understood in the cognitive scientific sense of the term, output some modal beliefs, such that cognitive-architectural constraints on perceptual systems explain how perception plays a necessary role in the formation and justification of most of our modal beliefs. The same approach was taken in Chapter 3, where I argued that the modal beliefs left out by perception can be justified if one considers the cognitive architecture of imagination instead. The end result is a general reliabilist account, which shows how experience, via perception and imagination, plays a necessary role in the justification of modal beliefs. The account is reliabilist, externalist, empiricist, and naturalistic. Its naturalism, however, is largely psychological, and, for this reason, it appears susceptible to some unresolved problems concerning the extent to which we can provide psychological explanations for modal reasoning.

Consequently, Chapter 4 took on some of these problems, precisely the ones that seem to block the psychological explanations offered in this dissertation. I addressed the problems and showed that my psychological explanations weren't defeated. The psychology of perception adequately explains how it is that we can perceive affordances, insofar as the metaphysics of affordances stand. Likewise, the psychology of imagination adequately explains how it is that we can imagine the kinds of possibilities that philosophers and scientists use in their sophisticated theorisations, insofar as we take cognitive-architectural constraints on imagination very seriously. These give a picture of what is going on in our minds when we modalise. A picture that explains how it is that, despite using our natural cognitive faculties, we can successfully form justified modal beliefs. A picture that separates modal epistemology from modal metaphysics by successfully engaging with the problem of modal justification, without reliance on any prominent metaphysics. A picture of what is actually possible from a psychological perspective.

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