



Abduction versus conceiving in modal epistemology

Stephen Biggs¹ · Jessica Wilson²

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Abstract

How should modal reasoning proceed? Here we compare abduction-based and conceiving-based modal epistemologies, and argue that an abduction-based approach is preferable, and by a wide margin.

Keywords Modal epistemology · Conceiving · Abduction · Theoretical virtues · A priority · Semantic indeterminacy · Kant · Carnap

1 Introduction

How should modal reasoning proceed? Here we compare abduction-based and conceiving-based modal epistemologies, and argue that an abduction-based approach is preferable, and by a wide margin. We begin with a brief sketch of each approach, highlighting salient differences (Sect. 2). We then discuss two historical precursors to an abduction-based approach: first, Kant's account of the synthetic a priori as the basis for philosophical (hence modal) belief; second, Carnap's account of explication as a guide to modally relevant intensions (Sect. 3). We then articulate and respond to the main obstacle to an abduction-based approach—namely, the widespread but mistaken assumption that abduction is an a posteriori mode of inference, and as such cannot generate modal beliefs (many of) which are supposed to be justified a priori (Sect. 4). Finally, we argue that an abduction-based approach has three crucial advantages over a conceiving-based approach: first, abduction but not conceiving has the ampliative resources enabling it to overcome widespread modal indeterminacy and associated

✉ Jessica Wilson
jessica.m.wilson@utoronto.ca

Stephen Biggs
biggs@iastate.edu

¹ Department of Philosophy, Iowa State University, Ames, Iowa, USA

² Department of Philosophy, University of Toronto (St. George and Scarborough), Toronto, Ontario, Canada

modal skepticism; second, abduction but not conceiving has the comparative theoretical resources enabling it to overcome errors in dispositions to apply concepts in non-actual scenarios; third, abduction but not conceiving has resources to make sense of substantive philosophical disagreement about, and progress in determining the status of, modal claims (Sect. 5). We have addressed some of this rich set of issues in previous work, including Biggs (2011) and Biggs and Wilson (2016, 2017a, b). Our discussion here synthesizes some of this previous work, while developing and extending its historical connections and argumentative force in several new directions.

Three preliminaries:

1. We use ‘abduction’ to refer not to what Peirce (1931) calls ‘abduction’, but rather to what Harman (1965) and Lipton (1991) call ‘inference to the best explanation’.
2. We presuppose that abduction has epistemic value (contrary to, e.g., van Fraassen 1980), where a mode of inference has epistemic value just in case it is justification-preserving—that is, just in case it is such that (absent defeaters) one’s belief in a conclusion C is justified if one uses that mode of inference to infer C from justifiably believed premises.¹
3. Our comparative assessment concerns modal epistemologies which differ as regards whether abduction or rather conceiving is the ‘ultimate’ arbiter of disputes over the status of modal claims. Informally, a mode of inference M is the ultimate arbiter of disputes in a domain D if and only if we should follow M wherever it leads in D . Somewhat more formally:

M is the ultimate arbiter of disputes in D if and only if for any D -claim P (1) we are justified in believing P if M supports P , and (2) we are unjustified in believing $\neg P$ or withholding belief in P if M supports P , regardless of what other modes of inference (or evidence that cannot be incorporated into M) support.

We take abduction to be the ultimate arbiter of disputes over the status of modal claims, and as per below, many proponents of conceiving-based modal epistemologies are reasonably seen as taking (appropriately idealized) conceiving to be such an arbiter.

Note that to say that mode of inference M is the ultimate arbiter of modal disputes is not thereby to deny that other modes of inference can lead to justified modal beliefs. Rather, it is to say that when we have serious questions about the truth-value of a given modal claim—when there is disagreement, or when we want to be as careful as we can be, or when we want to achieve the best possible justification for our beliefs—we should rely on M rather than on any other mode of inference. Hence even if, as we will argue below, abduction but not conceiving is up to the task of being the ultimate arbiter of modal disputes, a weakened conceiving-based modal epistemology on which conceiving can provide *prima facie* justification for modal claims wouldn’t necessarily be in competition with our view.

¹ Those who prefer talk of knowledge, warrant, entitlement, or some other kind of epistemic goodness can substitute accordingly for our talk of justification in what follows, *mutatis mutandis*.

2 Two approaches to modal epistemology

Abduction is a mode of inference in which one infers the truth (more weakly: likely truth, or rational acceptance; for simplicity we'll henceforth suppress these possible qualifications) of whichever theory best explains a targeted explanandum. The ranking of theories proceeds via the comparative evaluation of how well these do with respect to abductive principles, including, among others, fit with relevant observational data, ontological and ideological parsimony, fruitfulness, explanatory comprehensiveness, and consilience. Although these desiderata are often called 'theoretical virtues', we call them 'abductive principles', in order to emphasize both their connection with abduction, and, more importantly, their nature: they are prescriptions for choosing between, not mere descriptions of, theories.

According to an abduction-based modal epistemology, abduction is the ultimate arbiter of disputes about modal claims. Consider the familiar dispute over the possibility of zombies: physical-functional duplicates of ordinary humans, who nonetheless lack qualitative mental features. On an abduction-based approach, the competing modal claims—*zombies are possible*, *zombies are impossible*—are treated as theories or (perhaps more plausibly in this case) as implications of theories, that aim to explain the relevant evidence. Among the relevant explananda will be the seeming fact that qualitative mental features are actually uniformly spatiotemporally correlated with specific sets of physical-functional properties, the seeming fact that qualitative mental features can enter into causing physical effects, the seeming fact that there is an explanatory gap between qualitative mental and physical goings-on, and (related to the last explanandum) the seeming fact that zombies are conceivable.

For simplicity, suppose that the competing modal claims are taken to be implications of (just) two theories: first, an epiphenomenalist version of naturalistic dualism along lines discussed in Chalmers (1996), which explains the aforementioned correlation by appeal to a contingent law of nature, and hence implies that zombies are possible; second, a reductive version of physicalism along lines discussed in Lewis (1972), which explains the aforementioned correlation by appeal to a necessary identity, and hence implies that zombies are impossible. Assessment of the status of the modal claims would then proceed, on an abductive approach, by ranking the associated 'theories' of whether zombies are possible, as a function of their comparative performance on relevant abductive principles. Each theory might be seen as on a par so far as explaining the correlation at issue. Reductive physicalism might be taken to score higher than naturalistic dualism along the dimension of ontological parsimony, as well as in accommodating mental causation (albeit as a variety of physical causation). Naturalistic dualism might be taken to score higher than reductive physicalism in making sense of the seeming explanatory gap between mental and physical, and the associated conceivability of zombies. These and other comparative abductive assessments then enter into an overall assessment of which theory and associated modal claim best explains the relevant data, with the upshot being that the claim associated with the highest-ranked theory should be taken to be true.

According to a conceiving-based modal epistemology, conceiving is the ultimate arbiter of disputes about modal claims. Consider the above dispute over the possibility of zombies. On a conceiving-based approach, the status of the claim *zombies are*

possible ultimately depends on whether zombies are conceivable (in a way elaborated below): if so, then the claim *zombies are possible* should be taken to be true; if not, then the claim should be taken to be false.² Chalmers (2002) offers a familiar and more specific characterization on which to “conceive of a situation” in a way that justifies belief in a relevant possibility statement *S* “is to in some sense imagine a specific configuration of objects and properties” by either forming “a perceptual mental image that represents *S* as being the case” or having “an intuition ... of (or as of) a situation in which *S*” (pp. 150–151); he moreover maintains that conceiving, properly understood, entails possibility and as such is the ultimate arbiter in disputes over modal claims the truth of which can be known (see again note 2). Many others, including Hume (1739), Yablo (1993) and Gertler (2006), have endorsed relevantly similar accounts of conceiving as the best and indeed the only means of accessing modal truth; as Gertler (2006, 205) puts it, “Conceivability is the only guide to necessity”.

Advocates of a conceiving-based modal epistemology typically take conceiving to involve taking one’s intuitive reactions to reveal (and be necessary for revealing) the extensions of our expressions or concepts in possible cases [see, e.g., Chalmers and Jackson (2001), pp. 320–321 and Gertler (2002), p. 205]. These intuitive reactions, in turn, are naturally taken to reflect one’s internally-available dispositions to apply those expressions/concepts. Hence Melnyk (2008) suggests that advocates of a conceiving-based modal epistemology must maintain that “to possess a concept with a given content is (at least in part) to have a certain set of mental dispositions to use the concept” (p. 271).

This is, of course, the briefest of sketches; and there are important subtleties that we are necessarily glossing here.³ What is most crucial for our contrastive purposes is that abductive principles play no epistemic role in a conceiving-based modal epistemology, as standardly understood. Of course, *qua* strict empiricist, Hume rejects inference to the best explanation as being, in general, a warranted mode of inference. Chalmers ties conceiving to perceptual imagination and intuition (as above), and assigns abductive principles no role in those forms of cognition. Nor do other contemporary advocates of conceiving-based modal epistemologies describe conceiving as deploying abductive

² Some advocates of a conceiving-based modal epistemology deny that inconceivability is a guide to impossibility. Lightner (1997) offers reasons to think that, while Hume took conceivability to be a guide to possibility, he did not take inconceivability (unless indicative of a contradiction) to be a guide to impossibility. Chalmers (2002) suggests that there might be cases of ‘open inconceivabilities’, where a target situation *S* cannot be positively conceived (say, because involving properties “that simply cannot be positively conceived at all”) but where, insofar as there is no apparent contradiction in *S*, *S*’s modal status remains open. These are versions of a conceiving-based modal epistemology provided that they are not conjoined with the further claim that we can know the truth-value of some open inconceivability. Neither Hume nor Chalmers advance that further claim. We could reformulate a conceiving-based modal epistemology accordingly to hold, using the case of zombies for illustration, that we should take the claim *zombies are possible* to be true if zombies are conceivable, and either false or unknowable if zombies are inconceivable (where the choice between the claim’s being false or instead unknowable would depend on whether the claim meets a sufficient condition for being an open inconceivability). We continue to work with the simpler view that we describe in the main text because shifting to the more complex view described here would not impact the dialectic, except to further support an abduction-based modal epistemology (by undesirably further restricting the range of justified modal beliefs that a conceiving-based modal epistemology can deliver).

³ See, e.g., Sober’s (2015) extensive discussion of the varieties of parsimony (‘simplicity’), and Chalmers’s (2002) extensive discussion of the varieties of conceivability. We gloss these subtleties because they have no bearing on the dialectic here.

principles. More explicitly, Chalmers and Jackson (2001, pp. 320–328) argue that abductive principles play no “justifying role” in conceiving, a position that Chalmers rehearses in his (2012) (pp. 167–169). It may be that one background motivation for the common supposition that abduction plays no justificatory role in conceiving is the also-common supposition that, while conceiving is an a priori belief-forming method, abduction is an a posteriori such method.⁴ We will later provide reasons for thinking that abduction is as ‘a priori’ as conceiving; but in any case it remains (as all parties agree) that these methods importantly differ in execution, potential outcomes, and (as will be brought out in Sects. 3 and 5) with respect to whether the belief-forming method at issue is ampliative.

Before continuing, we note four points:

1. Both abduction-based and conceiving-based modal epistemologies typically qualify that the abductors or conceivers whose deliberations serve as a basis for the justification of modal claims are in a relevant sense ‘ideal’, in being appropriately cognitively competent, possessing the relevant concepts, and so on. In what follows we take this assumption as read *vis-à-vis* the ‘end of day’ status of modal claims, although the methodologies are of course intended to be useful working guides to the status of modal claims in good, if not ideal, circumstances.
2. Chalmers’s invocation of imagination and intuition suggest a close affinity between a conceiving-based modal epistemology and modal epistemologies appealing to imagination (e.g., Kung 2010) or intuition (e.g., Bealer 2002). Indeed, with presentational changes, our foil could be an imagination-based or intuition-based modal epistemology. In addition to those already mentioned, modal epistemologies that we take to be either conceiving-based or relevantly similar (in also eschewing abductive principles, and in plausibly facing difficulties similar to those we will raise against conceiving-based approaches in Sect. 5) include, among many others, those operative in Bonjour (1998), Chalmers (2006, 2009), Chalmers and Jackson (2001), Gertler (2002), Jackson (1998), Kripke (1972)/80, Lewis (1994), and Peacocke (1993). Modal epistemologies that are relevantly different from conceiving-based approaches, and so perhaps immune to the concerns we raise against conceiving-based approaches, include, among others, those advanced in Bueno and Shalkowski (2015), Fischer (2016, 2017), Hanrahan (2017), Leon (2017), Roca-Royes (2017), Rasmussen (2014), Strohming and Yli-Vakkuri (2017) and Williamson (2013). We will explore our reasons for preferring an abduction-based modal epistemology to these non-conceiving-based alternatives in future work.⁵
3. Proponents of abduction-based and conceiving-based modal epistemologies maintain that their preferred mode of inference is not just a way to form justified modal

⁴ A belief-forming method is a priori if it can eventuate in justified beliefs that cannot be justified via (relevant kinds of) experience. See, e.g., Bonjour (1998), Casullo (2001, 2003), Russell (2017) and Biggs and Wilson (2017b) for further discussion of which kinds of experience are relevant to assessing whether a given belief-forming method is a priori; we follow standard practice in assuming that perceptual experience is relevant to this determination, but certain kinds of cognitive experience, including experience associated with coming to possess concepts associated with a given belief, and experience of reasoning, are not.

⁵ Other work with which we cannot fully engage here includes Aliseda (2006), Magnani (2017), Woods and Gabbay (2005) and Woods (2013).

beliefs, but is moreover the ultimate arbiter of modal disputes. Consequently, although proponents of a given approach need not deny that the other approach can produce justified modal beliefs, proponents must hold that we are justified in believing the claims that their approach delivers, regardless of what the other approach delivers.⁶

4. Writing on modal epistemology often takes for granted that accounting for justified beliefs about actualized possibilities is much easier than accounting for justified beliefs about necessities and un-actualized possibilities. After all, the line of thought goes, one can deduce that dogs possibly bark from the perceptually justified premise that dogs actually bark, a procedure that invariably fails when necessities and un-actualized possibilities are at issue. Correspondingly, modal epistemologies are often advanced, even if only implicitly so, as epistemologies of necessities and un-actualized possibilities, leaving actualized possibilities aside. Although we doubt that the deduction-from-perception procedure can do as much work as some [e.g., Leon (2017)] think, we henceforth assume this familiar domain restriction.⁷

3 Roots of an abduction-based modal epistemology

Modal epistemologies centering on conceiving, imagination, and intuition dominate the contemporary landscape. With the dominance of conceiving-based views in mind, Yablo (1993) says that “if there is a seriously alternative [epistemic] basis for possibility theses, philosophers have not discovered it” (2). Over two decades later, such a view is still commonly taken for granted, as reflected in Gertler’s (2006) remark above,⁸ and in

⁶ Might abduction and conceiving each be ultimate arbiters of modal disputes? Not if they ever deliver different results as directed at the same claim. For in any such case, and given that we should believe whatever results an ultimate arbiter delivers, we would be forced to believe a contradiction, which even if possible is not advisable. This much is compatible with conceiving and abduction both being ultimate arbiters in non-overlapping domains (e.g., pertaining to abstracta and concreta); but such a view is antecedently unsystematic, and in any case (as we will substantiate in what follows) these forms of modal justification frequently do target the same claims and at least sometimes deliver different results; correspondingly, there can be only one ultimate arbiter. For further discussion of each modal epistemology see Biggs (2011); Biggs and Wilson (2017b).

⁷ Why do we doubt the familiar claim that the epistemology of actualized possibilities is comparatively easy? Suppose that Sam and Fatema attend Ping’s funeral. Sam takes her seeing Ping’s corpse to be her seeing Ping. She then deduces from the belief that she sees Ping (conjoined with her belief that corpses lack minds) that a person can survive without their mind. But surely, it’s not that easy to falsify psychological theories of personal identity! And what are we to do when Fatema denies Sam’s observational premise, claiming to see Ping’s corpse but not Ping himself? The lesson: perception cannot establish the premise about actuality that Sam needs in order to infer her modal conclusion. Although we cannot substantiate the following suspicion here (though see footnote 9 for relevant further discussion), we suspect that most attempts to deploy the deduction-from-perception procedure suffer a similar shortcoming, even if we fail to notice this shortcoming when we agree about what we “see”.

⁸ The quote in full is as follows:

Conceivability is the only guide to necessity; our concepts, and the intuitions about possibility that derive from them, provide our only grip on modal claims. [...] [I]t’s worth mentioning that modal intuitions—intuitions about what is possible and impossible, which it is the aim of conceivability arguments to reveal—are as important to arguments for reductionism as they are to anti-reductionist claims. Again, reductionism entails that it’s impossible for the reduced property to vary independently of the reducing property. Since a

the recent *Stanford Encyclopedia of Philosophy* entry on modal epistemology (Vaidya 2017), which thoroughly explores modal epistemologies centering on conceiving, intuition, and imagination, but merely notes the existence of two such epistemologies appealing to abduction, both recently developed. Notwithstanding its contemporary neglect, however, the suggestion that abduction, not conceiving, is the ultimate guide to modality has historical roots in Kant's account of the synthetic a priori, and in Carnap's explication-based approach to modality. These historical antecedents provide independent motivation for taking an abduction-based approach seriously, and also prefigure certain concerns with conceiving-based accounts that we will develop down the line.

3.1 Kant and the synthetic a priori

Kant (1965) introduces his analytic-synthetic distinction as follows:

In all judgments in which the relation of a subject to the predicate is thought [...] this relation is possible in two different ways. Either the predicate *B* belongs to the subject *A* as something that is (covertly) contained in this concept *A*; or *B* lies entirely outside the concept *A*, though to be sure it stands in connection with it. In the first case, I call the judgment analytic, in the second synthetic. (p. 130, A67)

Kant goes on to elaborate on the notion of containment, saying that a concept contains a predicate if one “need only to analyze the concept [...] in order to encounter this predicate therein”, where analyzing the concept is “merely [drawing] out the predicate in accordance with the principle of contradiction”, thereby revealing the “necessity of the judgment” (p. 130, A7). A judgment is synthetic, then, if justifiably forming it requires doing more than drawing out the predicate from what the subject contains.

Reflecting his skepticism about definitions (pp. 637–638, A727–729), to which we return in Sect. 5.2 below, Kant maintains that analyticity is largely insignificant for purposes of philosophical, hence modal, theorizing. He recognizes, moreover, that perception cannot justify modal beliefs. Accordingly, he maintains that modal judgments are typically synthetic, always a priori, and rarely justified through conceptual analysis, which he thinks of as nothing more than the process of discovering what “is (covertly) contained” in a concept.

Kant's presumption that cases in which one “need only to analyze the concept [...] in order to encounter this predicate therein” are rare, and his corresponding rejection of conceptual analysis (so understood) as a basis for philosophical theorizing, pushes against a conceiving-based modal epistemology. For as previously, the latter similarly aims to uncover, by canvassing one's intuitive dispositions to apply or not apply a concept in a given situation, content that is supposed to be antecedently available to an appropriately positioned conceiver.

Footnote 8 continued

claim of impossibility cannot be established by considering the actual world alone (though of course it can be refuted in this way), the reductionist must consider whether certain non-actual scenarios are possible. And the only way to determine this is to use the method of conceivability. (Gertler 2006, p. 205)

More positively, Kant's invocation of synthetic a priori judgments, and his presumption that they are central to modal theorizing, suggests that modal reasoning should proceed by way of a mode of inference that is both ampliative and a priori—ampliative so that it can deliver results that extend beyond whatever the concepts at issue antecedently contain, and a priori so that it can deliver results that extend (as modal judgements do) beyond what empirical investigation can provide. Indeed, Kant says that one “could call [analytic judgments] judgments of clarification and [synthetic judgments] judgments of amplification” (p. 130, B11).

By Kant's lights, then, conceiving is an inadequate basis for modal reasoning, because such reasoning must be ampliative, and conceiving is not ampliative. Imagination and intuition suffer similar shortcomings, and enumerative induction, while ampliative, cannot [contra Mill (1843)/1973 and Leon (2017)] deliver significant modal knowledge.⁹

That leaves abduction, or something very like it. Notwithstanding that Kant never explicitly says that abduction (or its underlying principles) is operative in forming synthetic a priori judgments, and correspondingly, never explicitly endorses an abduction-based modal epistemology, it is reasonable to see him as being tacitly committed to such a view. Additional motivation for this latter claim is reflected in Kant's frequently taking explanatory considerations to justify philosophical beliefs; indeed, inference to the only possible explanation is a pillar of his transcendental idealism. Nor does the fact that synthetic modal judgements are a priori, for Kant, undercut the suggestion that abduction is centrally operative in the making of such judgements, for as per Biggs and Wilson (2017b) and as we will discuss down the line, abduction is an a priori mode of inference. In any case, Kant's appeal to the synthetic (i.e., ampliative) a priori provides independent motivation for taking seriously the suggestion that modal epistemology requires an ampliative form of inference going beyond conceptual containment, and hence is appropriately seen as an historical precursor to an abduction-based modal epistemology.

3.2 Carnap and the explication of concepts

Carnap (1950, 1963) explicitly develops a modal epistemology centrally appealing to abduction.

Carnap's account of what constitutes semantic knowledge implies that, contrary to Kant, conceptual analysis is central to modal reasoning. Carnap maintains that to know the meaning of an expression or concept (he runs these together) is to know

⁹ One might wonder whether Kant is wrong here: can't enumerative induction provide a basis for ampliative modal knowledge (as per Leon 2017), such that, though Sam is on time for work today, she can infer that she could have been late from the premise that today is relevantly similar to the many days on which she has been late in the past? As we see it, however, this induction presumes, rather than establishes, that Sam is merely contingently on time for work; for it presumes, rather than establishes, that the person who arrived late in the past was Sam, notwithstanding their lateness. It is the presumption rather than enumerative induction that is doing the heavy epistemic lifting here. Nor is it clear that the presumption at issue is justified through (memory plus) observation, as premises in enumerative inductions often are; for we must judge, rather than observe, that the person that arrived late on previous occasions is Sam, notwithstanding their lateness. After all, the world would look exactly the same whether it was necessary or rather merely contingent for being Sam that Sam be on time. See footnote 7 for relevant discussion.

its extension in possible cases, such that “to know the meaning of [a statement or proposition] is to know in which of the possible cases it would be true and which not” (1950, p. 10). Here a possible case is a ‘state description’: i.e., a maximal collection of statements representing a (“Leibnizian”) possible world. According to Carnap, then, conceptual analysis is the basis for modal knowledge: analyzing expressions/concepts allows one to identify their extension in any possible case, hence to know the truth-value of any corresponding statement/proposition in any possible case, hence to know the truth-value of any corresponding modal statement/proposition.

Since Carnap’s account of what constitutes knowledge of meaning implies that conceptual analysis can produce expansive modal knowledge, one might expect Carnap to advocate (or at least presume) a conceiving-based modal epistemology, and correspondingly, to embrace (or at least presume) the anti-Kantian view that philosophically interesting concepts mostly have robust antecedently encoded application conditions that we can discover through conceiving.

This expectation would be incorrect, however. In fact, Carnap agrees with Kant that concepts antecedently “containing” their *definiens*, in the operative sense, are rare. Rather than following Kant in rejecting conceptual analysis as a means to modal knowledge, however, Carnap maintains that conceptual analysis can do far more than merely uncover what a given concept antecedently contains. More specifically, Carnap’s account of conceptual analysis centers on explication:

The task of explication consists in transforming a given more or less inexact concept into an exact one or, rather, in replacing the first with the second. We call the given concept (or the term used for it) the explicandum, and the exact concept proposed to take the place of the first (or the term proposed for it) the explicatum. (1950, p. 3)

For Carnap, then, conceptual analysis is not merely the process of unpacking the content that a given concept antecedently contains, but rather involves a process of explication which adds to and indeed may change the content of the concept, and which results in a filled-in or new concept, as explicatum of the old. Hence while Carnap maintains, contrary to Kant, that modal reasoning proceeds by way of conceptual analysis, Carnap and Kant ultimately agree that the mode of inference operative in modal reasoning must be ampliative.

Yet more crucially for our purposes, Carnap develops his account of conceptual analysis, and hence his account of modal epistemology, by identifying the relevant ampliative mode of inference—that is, by specifying how we should execute the transformation from inexact to exact concepts, such that we will thereby be in position to identify a concept’s or expression’s extension in any possible case. On his account, for any explicandum D and explicata T and T^* , T is superior to T^* to the extent that T scores better than T^* does on the following four desiderata: “(1) similarity to the explicandum, (2) exactness, (3) fruitfulness, (4) simplicity” (1950, p. 5).

Elaborating, T is better than T^* to the extent that (1) T is more similar than T^* to D in that T has the same extension as D across more possible cases than T^* does; (2) T is more exact than T^* in that T has an extension in more possible cases than T^* does; (3) T is more fruitful than T^* in that T figures into more effective

theorizing than T^* does; and (4) T is simpler than T^* , in a way that Carnap does not specify. Because T may be better than T^* in some ways and worse in others, Carnap provides guidance for ranking these desiderata, with fruitfulness being most important (invariably trumping even similarity) and simplicity being least important (used only to choose among explicata that tie on all other desiderata). Later, however, driven by concerns advanced by Strawson (1963), Carnap (1963) hedges on this ranking, suggesting that similarity may be more important than he initially allows; see Biggs and Wilson (2016) for further discussion. Whatever the precise ranking, in any case it is clear that Carnap takes explication to proceed in standard abductive fashion.

Attention to Carnap's account of conceptual analysis as involving explication and associated abductive guidance thus makes clear that abduction, not conceiving, plays the role of ultimate arbiter of modal truths on his account. Now, to be clear, Carnap held that his desiderata provide pragmatic, not epistemic, grounds for choosing one explicatum over another. But this view reflects his now-dated verificationism, which led him to maintain that abductive principles lack epistemic value in all domains, rather than reflecting any compelling reason to think that abductive principles have no epistemic value when deployed during explication in particular. Given that abduction does have epistemic value, as we are assuming and as contemporary philosophers are nearly uniformly willing to grant, Carnap's use of abduction in explication and his associated modal epistemology are reasonably seen as prefiguring an abduction-based modal epistemology.

3.3 Two versions of an abduction-based modal epistemology

Kant and Carnap agree that, due to our concepts' typically failing to 'contain' content suitable for determining a given concept's 'definition' (Kant) or associated range of extensions in non-actual scenarios (Carnap), any adequate modal epistemology must crucially rely on an ampliative mode of inference. For Kant, this is plausibly (if tacitly) abduction; for Carnap, this is explicitly abduction.

Kant and Carnap disagree about whether modal (more generally, philosophical) reasoning proceeds by way of conceptual analysis—a disagreement reflected in Kant's introduction of the notion of the synthetic a priori. This last divide yields two versions of an abduction-based modal epistemology: a broadly Kantian version on which abduction is primarily employed in choosing among competing modal theories [see Biggs (2011) and Fischer (2016, 2017) for contemporary views along this line], and a broadly Carnapian version on which abduction is primarily employed in determining the content and/or extensions of concepts, which extensions then serve as the basis for judgements about which modal claims are correct [see Biggs and Wilson (2016, 2017a) for a contemporary view along this line]. Here we largely remain neutral between these versions, distinguishing them only when need be.

For our purposes, what is most crucial is that for both Kant and Carnap, modal deliberation proceeds by way of an ampliative form of inference which either is or is very like abduction. As such, their views are clear historic precursors of an abduction-based modal epistemology. This fact alone provides some motivation, in our view, for thinking that the contemporary assumption that modal epistemology must proceed by

way of conceiving (or some imagination- or intuition-based variation on the theme) is premature.

Three other points relevant to motivating attention to an abduction-based modal epistemology are worth emphasizing. First, attention to Carnap's explicative understanding of conceptual analysis suggests that the common inference from modal epistemology's involving conceptual analysis to such epistemology's proceeding by way of conceiving [operative in Gertler (2002) remarks, above] is too quick, since on Carnap's understanding conceptual analysis proceeds by way of abduction. Second, and as already observed, attention to Kant's view according to which modal (more generally, philosophical) knowledge is both synthetic and a priori suggests that there are historical precursors to the view [as per Biggs and Wilson (2017b), and as we will discuss below] that abduction is an a priori mode of inference. Third, both Kant and Carnap are led to see modal deliberation as proceeding by way of ampliative inference for reasons that echo contemporary concerns with conceiving as a basis for modal or other philosophical deliberation—namely, that for one reason or another, neither we nor idealized versions of ourselves are plausibly seen as being in position to simply read off the content of concepts to an extent that could serve as a basis for substantive modal (philosophical) knowledge. We see ourselves as following in this underappreciated tradition, along both constructive and critical dimensions.

4 The a priority of abduction

What underlies the contemporary neglect of abduction-based modal epistemologies (whether or not understood as proceeding via conceptual analysis), notwithstanding the historical precursors of such an approach? This reticence primarily stems, we suspect, from two widely held claims which jointly imply that no adequate modal epistemology can be abductive: first, the claim that modal epistemology must proceed, at least for the most part [in particular, modulo the sort of a posteriori contribution highlighted by Kripke (1972)/80], in a priori fashion; second, the claim that abduction is not an a priori mode of inference. To prefigure, we accept the first claim, but reject the second.

Re the first claim: that modal epistemology must proceed (again, modulo Kripkean considerations) in largely a priori fashion is as widely accepted as any philosophical claim.¹⁰

This is, in our view, for good reason. As a matter of fact, and as will be familiar to any philosopher, reasoning about modal claims happens in the armchair; we come to know and to justifiably believe such claims as a result of reflection rather than observation. Of course, such reflection may and often does invoke observations, as when those considering whether zombies are possible invoke the supposition that certain mental features are spatiotemporally correlated with certain physical features. But the conclusions drawn through modal reasoning surpass what relevant observation provides. Consider, again, the question of whether zombies are possible. Bracketing

¹⁰ Possible exceptions to this claim include Fischer (2016, 2017), Roca-Royes (2017), Leon (2017), Williamson (2013), Hanrahan (2017), Bueno and Shalkowski (2015) and Strohminger and Yli-Vakkuri (2017)—though in our view, these proposals succeed to the extent they do in virtue of appealing to an a priori mode of inference (e.g., abduction), notwithstanding their stated claims to the contrary.

the question of other minds (or non-minds), we can observe (let us grant) that there are actually no zombies, and we can moreover observe (let us grant) that qualitative mental features are uniformly spatiotemporally correlated with certain physical features. But such observations don't, of course, settle the modal question of whether zombies are possible, since the actual absence of zombies and the actual presence of certain correlations are compatible with either the possibility of zombies (if, e.g., the correlations are taken to reflect a contingent psychophysical law, as per a naturalist dualist of the sort Chalmers discusses) or the impossibility of zombies (if, e.g., the correlations are taken to reflect a necessary identity, as per a reductionist of the sort Lewis discusses). In this and other cases, modal epistemology must proceed via some or other a priori belief-forming method.¹¹

Re the second claim: the view that abduction is an a posteriori mode of inference is widespread, even hegemonic. As Beebe (2009) notes, “practically everyone who works on abductive inference believes that such inferences are justified empirically and that abductive principles are broadly empirical and contingent marks of truth” (p. 625). Supposing so, then given that (as per the first claim) modal epistemology must proceed in broadly a priori fashion, there is no hope of basing such an epistemology on abduction.

But is there really good reason to suppose that abduction is an a posteriori mode of inference? In Biggs and Wilson (2017b) we argue at length, and from a number of different directions, to the contrary. In this section, we highlight the considerations that we see as most relevant to the question at hand. In Sect. 4.1, we provide a new and more formally explicit presentation of the sort of reasoning that is plausibly taken to underlie the supposition that abduction is a posteriori, and we argue that this reasoning is unsound. In Sect. 4.2, we argue that considerations raised in Sect. 4.1 moreover provide positive reason to think that abduction is a priori. Finally, in Sect. 4.3, we argue (drawing on our 2017b) that abduction is on a par with conceiving with respect to the role(s) that experience plays in these forms of inference. Taken together, these results remove what we take to be the main obstacle(s) to an abduction-based modal epistemology.

4.1 Unsound motivation for the a posteriority of abduction

As in Beebe's (2009) remarks above, the claim that abduction is an a posteriori mode of inference is taken to follow straightforwardly from abductive principles' being “contingent marks of truth”. More explicitly: since abduction is constituted by the application of abductive principles, the epistemic value of abduction hinges on the epistemic value of the principles; but if these principles are merely ‘contingent marks of truth’, then any epistemic value they possess must be a posteriori, not a priori—

¹¹ Similar remarks hold even if, following Lewis (1986), one takes the truth of modal claims to reflect goings-on in possible worlds of the same (concrete, individual) type as the actual world: since no one at a given concrete possible world can observe goings-on at other concrete possible worlds, any modal reasoning on this view must proceed in a priori fashion. Nor will appeal to some other metaphysical property (e.g., essentiality) or relation (e.g., identity) as the empirical basis for modal claims help, for the epistemology of any such property or relation will face the same problem. For example, Sam stands at sixty-two inches whether her height is essential or accidental, and were the person inhabiting Sam's body to grow or shrink, we would judge, not see, that Sam survives (or does not survive) the change; similarly, Mark Twain shares Samuel Clemens's white hair and mustache, whether the two are identical or are merely spatiotemporally coincident.

and similarly for abduction, since constituted by such principles. The principle of ontological parsimony (henceforth, ‘Parsimony’) is the kind of abductive principle that Beebe and others have in mind; so in what follows we focus on this principle as representative.¹² Now, the claim that Parsimony is a contingent mark of truth is invariably taken to be too obvious to require defence, but reading between the lines of, e.g., the discussions in Bonjour (1998), Chalmers and Jackson (2001) and Beebe (2009), the following form of argument is plausibly operative:

1. More parsimonious theories are sometimes actually false.

Therefore,

2. In some world, more parsimonious theories tend to be false.
3. If there is a world where more parsimonious theories tend to be false, then Parsimony is a contingent mark of truth.

Therefore,

4. Parsimony is a contingent mark of truth.¹³

Correspondingly, the line of thought continues, the epistemic value of abductive appeals to Parsimony is a posteriori. Given the foundational status of Parsimony in abductive reasoning, this is enough to show—or so one might think—that the epistemic value of abduction, hence the justification conferred by abduction, must be a posteriori rather than a priori. But in any case, arguments similar to the one for the conclusion that Parsimony is a contingent mark of truth can be canvassed for other abductive principles.

This sort of case for abduction’s being an a posteriori mode of inference has prima facie appeal, whether Parsimony or some other abductive principle is taken to be at issue in the initial argument. But the argument rests on an equivocation. We’ll again illustrate by attention to the case of, or against, Parsimony; as we will now argue, depending on what is meant by a theory’s being “more parsimonious”, either premise (1) or premise (3) is false.

To start, consider what it would take to show that Parsimony lacks epistemic value. An advocate of the above argument is presumably imagining something like the following situation:

At t_1 Sam chooses between theories T and T^* as explanations for evidence E . She chooses T over T^* because T is more ontologically parsimonious. At t_2 she encounters new evidence E^* . T^* predicts E^* , but T does not. Accordingly,

¹² Here we have in mind a principle of qualitative ontological parsimony, according to which, *ceteris paribus*, one should prefer theory T over theory T^* if T implies the existence of fewer kinds than T^* . Most of what we say applies, and all crucial points apply, *mutatis mutandis*, to any principle of parsimony or ‘simplicity’, including principles of quantitative ontological parsimony and principles of syntactic simplicity, according to which, *ceteris paribus*, one should prefer theory T over theory T^* if (assuming a syntactic view of theories) T includes fewer logical connectives and sentences than T^* or (assuming a semantic view of theories) if T is a more elegant model than T^* . See Sober (2015) for further discussion of principles of simplicity.

¹³ One might think that the consequent of premise (3) and the conclusion should rather express that Parsimony is at best a contingent mark of truth. This qualification would be superfluous, however, since we are presupposing that Parsimony, as an abductive principle, actually has epistemic value.

discovering E^* leads Sam to rationally reject T in favor of T^* , even though T is more parsimonious.

Now, is this a case of someone discovering that Parsimony lacks epistemic value? No; for no plausible principle of parsimony (ontological or otherwise) counsels us to choose the more parsimonious theory no matter what.¹⁴ Rather, Parsimony counsels us to believe the most parsimonious explanation among those accounting for relevant evidence. More generally, Parsimony counsels us to choose the most parsimonious theory all other things being equal—i.e., provided that each theory performs equally well (or well enough) along whatever other abductive dimensions are relevant. As such, Parsimony does not require that one choose the more parsimonious theory; rather, it requires that one choose a less parsimonious theory only if this theory has one or more sufficient advantages over more parsimonious theories. Accordingly, and returning to the specific case in which Sam changes her view as a result of confronting new evidence: what Sam discovers at t_2 is not that Parsimony led her astray at t_1 , but rather, that unbeknownst to her at t_1 , all other things were not equal between T and T^* , so that Parsimony did not support T over T^* at t_1 , even though Sam mistakenly thought it did.

With this sort of case and its proper interpretation in mind, let's return to the argument for the claim that Parsimony is a contingent mark of truth. The argument is intended to suggest that whether more parsimonious theories tend to be true or instead tend to be false bears on the epistemic value of Parsimony. The phrase “more parsimonious theories” is ambiguous: on one reading, it is intended to refer to theories that a proper application of Parsimony supports; on another reading, it is intended to refer simply to theories that posit fewer kinds (than some other theories posit). Where the argument at issue goes wrong depends on which reading one adopts.

Suppose, first, that “more parsimonious theories” refers to theories that a proper application of Parsimony supports. On this reading, (3) will say that if there is a world where theories that Parsimony supports tend to be false, then Parsimony is a contingent mark of truth. Perhaps this conditional is true. But then (1) will say that theories that Parsimony supports are sometimes actually false, and (2) will say that there is a world where theories that Parsimony supports tend to be false, each of which is implausible in light of the situation involving Sam. For as per our discussion of that situation, candidate cases (actual or hypothetical) in which Parsimony seemingly supports a false theory are in fact cases in which its *ceteris paribus* clause is violated.

Suppose, second, that “more parsimonious theories” refers to theories that posit fewer kinds (than some other theories posit). On this reading, (1) will say that theories that posit fewer kinds are sometimes actually false, and (2) will say that there is a world where theories that posit fewer kinds tend to be false, each of which is plausibly true. But then (3) will say that if there is a world where theories that posit fewer kinds tend to be false, then Parsimony is a contingent mark of truth, which is implausible in light of the situation involving Sam. For as per our discussion of that situation, Parsimony does not counsel us to choose theories that posit fewer kinds no matter what, but rather to choose theories that posit fewer kinds *ceteris paribus*. Accordingly, how many kinds

¹⁴ Any principle offering such counsel would render observation irrelevant to theorizing, since we could then immediately infer that we should believe that nothing exists, regardless of what we observe!

there are, and correspondingly, whether theories positing fewer kinds tend to be true or tend not to be true, has no bearing at all on whether applying Parsimony tends to lead to true belief.

The argument motivating the claim that Parsimony is a contingent mark of truth, therefore, is unsound. Hence that claim remains unmotivated, as does the more general claim that, since the epistemic value of abduction depends on contingent matters of fact, abduction is an a posteriori mode of inference.

4.2 Sound motivation for the a priori of abduction

We can say more; for the situation involving Sam suggests that, contrary to usual assumption, Parsimony is a necessary mark of truth; for since this principle includes an appropriate *ceteris paribus* clause, it is reasonably taken to be immune to empirical disconfirmation. And similarly for all abductive principles. From this it follows that abductive principles have epistemic value, and moreover that they have this value a priori. But abductive reasoning is ultimately constituted by the joint application of whatever abductive principles are relevant; hence from each of these having a priori epistemic value, we can reasonably conclude that abduction itself has a priori epistemic value.

Some might be inclined to object that the epistemic value attaching to Parsimony cannot be a priori, on grounds that there are plausibly worlds where applying Parsimony systematically leads to false belief. Suppose, for example, that there is a world that includes all sorts of hidden entities—hidden not just in being unobservable, but moreover in being such that no application of any available resources—rational, perceptual, or otherwise—could ever give any hint of their existence. Applying Parsimony in such world, the objector suggests, would tend to lead its inhabitants astray, in which case Parsimony would fail to be a mark of truth, and more generally would fail to have a priori epistemic value.

We respond, first, that it is unclear whether such a situation is one in which Parsimony lacks epistemic value. After all, we will not be led astray in appealing to Parsimony in theorizing about such a world, since (as it happens) we know about its hidden objects. Extrapolating from this salient difference, one strategy of response here might be to maintain that the inhabitants in the world are not in position to be (or to be relevantly similar to) suitably idealized abductors.

We respond, second, that in any case it is not obvious that applying Parsimony would lead the inhabitants of such a world to form false beliefs, since it is not obvious that the hidden entities at issue would enter into the extension of any concepts (or expressions) they might possess; correspondingly, it is not obvious that the existence of said hidden entities would be relevant to the truth-value of any propositions inhabitants might be in position to believe.¹⁵

We respond, third, that in such a world, applying modus ponens to beliefs whose truth value is impacted by the hidden entities would also lead us astray, because the

¹⁵ Compare the reasons set out in Wilson (2015) for thinking that the presence or absence of quiddities—the property equivalents of primitive haecceitistic identities—is irrelevant to the denotations of scientific expressions and the truth values of claims using such expressions.

premises at issue would be false. Such a result would not in itself undermine the usual supposition that modus ponens has a priori epistemic value—that is, is an a priori mode of inference. Correspondingly, even granting that at some worlds, applications of Parsimony to false premises tend to produce false beliefs, this would not in itself undermine our claim that Parsimony has a priori epistemic value, or, more generally, our claim that abduction is an a priori mode of inference. On the contrary: “garbage in, garbage out” clearly holds even for modes of inference that are standardly supposed to be a priori. Nor can a wedge be drawn here between abduction and modus ponens on grounds that modus ponens is a prescription that governs inference rather than a “mark of truth”. For as we earlier prefigured, abductive principles are also prescriptions governing inference; hence our use of ‘abductive principles’, rather than ‘theoretical virtues’.¹⁶ Indeed, another problem with the usual line of thought purportedly showing that abduction is a posteriori precisely consists in observing that it tacitly imports an inappropriate conception of the application of abductive principles as descriptive (that is, as describing some theory as instantiating this or that theoretical virtue) rather than prescriptive—a mistake encouraged by Beebe’s talk of ‘marks of truth’.

We respond, fourth, that the existence of a hidden entity world is irrelevant to the question of whether our belief in the epistemic value of abduction is justified a priori or a posteriori. Even if (contrary to our second response) the hidden entities were in the range of the quantifiers used by the inhabitants of the hidden entity world, and (contrary to our third response) applications of Parsimony in such a world were sometimes to blame for the inhabitants’ forming false beliefs,¹⁷ it would remain that the inhabitants of the world would have no means of determining that they were in a hidden entity world. Correspondingly, if we were in such a world, we would have no means of determining this. But then, since we are justified in believing that Parsimony has epistemic value, it follows that justifiably believing that Parsimony has epistemic value cannot require determining that we are not in a hidden-entity world—at least, granting that a world containing insuperably hidden entities is possible. So the existence of a hidden entity world would have no bearing on how our belief in the epistemic value of abduction comes to be justified—i.e., on the epistemic value of abduction—even if the hidden entity world were our very own.

A final objection might consist in maintaining that our way of understanding Parsimony renders it useless, since it suggests that applying Parsimony tends to lead to true belief only if we are in possession of all relevant evidence—which we never are. But

¹⁶ This point can help make sense of Kant’s view that, as Sober puts it, “reason commands us to assume that the laws of nature are simple” despite the fact that “we have no a priori guarantee that the world is actually simple” (2015, 41). To say that “we have no a priori guarantee that the world is actually simple” is to say that there are worlds where theories that posit fewer kinds tend to be false. To say that “reason commands us to” believe simpler theories is to say that a principle of simplicity has epistemic value.

¹⁷ Even given these two suppositions, it is unclear that Parsimony would tend to lead the inhabitants of the hidden entity world to form false beliefs. Any beliefs about derivative entities that inhabitants form via applications of Parsimony, and which are false due to the presence of the hidden entities at issue, would be the result of false premises about the fundamental, and so, (as per our third response) it would not be Parsimony that leads them to those false beliefs. Accordingly, at most, Parsimony would mislead the inhabitants with respect to beliefs about the fundamental that include a “that’s all” clause, and whose truth-value is impacted by the hidden entities. Presumably, that would be a rather small subset of the total number of beliefs that the inhabitants would or could form through Parsimony.

here again the same holds of modus ponens and other a priori forms of inference in good standing. Indeed, it is plausible that every good form of inference tends to lead to true belief only if applied to enough relevant evidence. So the objection, if successful against Parsimony and abduction, would apply to effectively every rule of inference. Indeed, and to return to the question of modality: if an abduction-centered modal epistemology fails because it will often produce false modal beliefs when operating on false empirical premises, then modal epistemologies based on conceiving will also fail; for they, too, will often produce false beliefs when operating on false premises. For example, given standard appeals to conceiving, the false empirical premise that all samples of water are samples of XYZ would lead to the false modal belief *necessarily, water is XYZ*. We correspondingly put this concern aside.

To sum up: the claim that abduction is an a posteriori mode of inference is typically taken for granted, as too obvious to need defense. The form of argument that plausibly motivates common belief in this claim is unsound, however, ultimately due to a failure to properly appreciate how the *ceteris paribus* clause in abductive principles effectively shields such principles from empirical disconfirmation, and relatedly, due to a failure to properly appreciate that abductive principles are prescriptions, not descriptions of theories—or worlds, for that matter—as being parsimonious (whatever that might come to), or as being such that more parsimonious theories tend to be true (or rationally believed, etc.). Moreover, consideration of where the usual line of thought goes wrong provides positive reason to think that abduction is a priori.

4.3 The role of experience in abduction and conceiving

We now supplement the positive considerations in favour of abduction's being a priori, by arguing (drawing on our 2017b), that experience plays the same roles in abduction-based modal reasoning as it plays in conceiving-based modal reasoning.

To start, note that there are four roles that experience might play in the course of forming a justified belief. Specifically, for any belief *b*, experience might play a role in ...

- i. ...acquiring the concepts required to have *b*,
- ii. ...acquiring the evidence required to justify *b*,
- iii. ...establishing the epistemic value of the mode of inference used to justify *b*, or
- iv. ...learning to deploy the mode of inference used to justify *b*.

Does experience play a role along these dimensions for abduction that it does not also play for conceiving? It seems not. Let's consider the roles in turn.

Re (i). Advocates of conceiving-based modal epistemologies allow that a belief can be justified a priori even if experience plays a necessary role in acquiring the belief's constituent concepts. Accordingly, they allow that conceiving can produce a priori justification for a modal belief even if experience plays a necessary role in acquiring its constituent concepts. For example, conceiving can provide a priori justification for the belief *necessarily, sisters are siblings*, even if experience plays a necessary role in acquiring the concepts *sister* and *sibling*. So, (i) cannot be the source of a relevant difference between abduction and conceiving.

Re (ii). Advocates of conceiving-based modal epistemologies deny that a belief can be justified a priori if experience plays a necessary role in acquiring the evidence required to justify the belief. Accordingly, if beliefs formed through abduction rely on empirical evidence for their justification whereas beliefs formed through conceiving do not, then that would provide reason to think that an abduction-based modal epistemology assigns a broader role to experience than does a conceiving-based modal epistemology. But we see no reason to believe the antecedent. Consider the beliefs *necessarily, sisters are siblings* and *necessarily, water is H₂O*. Neither abduction nor conceiving assigns empirical evidence a necessary role in justifying the former, and both assign experience a necessary role in justifying the latter. Moreover, as is familiar from the sort of epistemic two-dimensional strategy commonly endorsed by many proponents of a conceiving-based modal epistemology, including Chalmers (1996), Chalmers and Jackson (2001), Gertler (2002), and others, the role of empirical evidence in claims such as ‘necessarily, water is H₂O’ is merely to discharge the antecedent of a conditional modal claim that is assumed to be justified a priori (‘if the actual watery stuff is H₂O, then necessarily, water is H₂O’). The role for experience on an abduction-based modal epistemology is exactly parallel, consonant with Hawthorne’s (2002, p. 252) suggestion that abduction can deliver a priori justification for belief in a conditional whose antecedent describes an ‘experiential life history’ and whose consequent is whichever theory best explains some aspect of that life history. Accordingly, (ii) cannot be the source of a relevant difference between abduction and conceiving.

Re (iii). Advocates of conceiving-based modal epistemologies do not usually address whether a belief can be justified a priori if experience is required to establish the epistemic value of the mode of inference used to justify the belief. But in any case, as previously argued, our justification for believing that abduction has epistemic value is a priori. Accordingly, even if a belief cannot be justified a priori if experience is required to establish the epistemic value of the mode of inference used to justify the belief, (iii) cannot be the source of a relevant difference between abduction and conceiving—unless, of course, experience is required to establish the epistemic value of conceiving, in which case conceiving would be unsuited to be the centerpiece of an adequate modal epistemology.

Re (iv). Advocates of conceiving-based modal epistemologies do not usually address whether a belief can be justified a priori if experience is required to learn to deploy the mode of inference used to justify the belief. Even if learning to deploy conceiving does require experience, one might reasonably maintain that the role of experience here is similar to that entering into the acquisition of concepts, and so is irrelevant to whether the inference is a priori; a proponent of an abduction-based modal epistemology could say the same. That being said, we think that abduction has at least as much of a claim to being innate as conceiving does [see, e.g., Feeney and Heit (2007) and Gelman and Markman (1986) for relevant empirical work]. To be sure, experience can tweak abduction’s parameters, leading people to give the same abductive principle slightly different weight, much as, according to the principles and parameters approach to grammar [cf. Chomsky and Lasnik (1993) and Chomsky (1995)], experience can tweak the parameters in grammatical structures that are in the relevant sense necessary. But experience can also tweak the parameters of conceiving,

as when we encourage students to think more imaginatively. Accordingly, (iv) cannot be the source of a relevant difference between abduction and conceiving.

Abduction, then, assigns experience the same roles in forming modal beliefs that conceiving does. Hence to the extent that these roles for experience do not undermine the status of conceiving as an a priori mode of inference, neither do they undermine the status of abduction as an a priori mode of inference.

5 Advantages of an abduction-based modal epistemology

As we saw earlier, certain historical precursors of an abduction-based modal epistemology were motivated in significant part by abduction's being ampliative, in contrast to conceiving. Indeed, this difference underlies several ways in which an abduction-based modal epistemology is superior to a conceiving-based modal epistemology. We now sketch three such advantages: first, abduction but not conceiving has the ampliative resources enabling it to overcome widespread seeming modal indeterminacy and associated modal skepticism (Sect. 5.1); second, abduction but not conceiving has the comparative theoretical resources enabling it to overcome errors in dispositions to apply concepts in non-actual situations (Sect. 5.2); third, abduction but not conceiving has resources to make sense of substantive philosophical disagreement about, and progress in determining the status of, modal claims (Sect. 5.3).

5.1 Overcoming modal indeterminacy and associated modal skepticism

Call a concept or expression 'modally indeterminate' if its content or intension fails to determine an extension in some possible situation. For any insuperably modally indeterminate concept/expression, there will be some (indeed, many) unknowable modal claims/statements. Consider, for example, a possible situation in which all and only samples of (imaginary chemical compound) XYZ are watery, and all samples of H₂O are tarry. If the concept *water* does not apply to the tarry H₂O in that situation, then the claims *possibly, H₂O is tarry* and *necessarily, H₂O is water* are each false. If the concept *water* does apply to the tarry H₂O in that situation, then these claims are each true (presuming, as *water's* applying to this tarry H₂O suggests, that *water* applies to H₂O in all other possible situations, too). Hence if the content of *water* fails to determine an extension in this possible situation, we will not be in position to know the truth values of these modal claims; and similarly for indefinitely many other modal claims involving *water*. Generalizing, for any modally indeterminate concept/expression, there are some (indeed, many) unknowable modal claims/statements.

The upshot of these observations is that modal knowledge is as sparse as insuperably modally indeterminate concepts/expressions are widespread.

This connection acts as an important constraint on our comparative investigations, for two reasons. First, it is plausible to suppose that, *ceteris paribus*, a modal epistemology that can deliver more modal knowledge is to be preferred to one that can deliver less. Correspondingly, given that the extent of modal knowledge is inversely proportional to the extent of modal indeterminacy, a proper comparison of abduction

vs. conceiving as modal epistemologies must consider whether there is likely to be much modal indeterminacy, and whether either or both of these modal epistemologies have resources suited to overcome the indeterminacy, and hence regain the associated range of modal knowledge. Second, the considerations here are foundational, more generally, to the viability of modal epistemology; for if it were to turn out that modal indeterminacy is both widespread and insuperable, the upshot would be a profound form of modal skepticism of the sort advanced in van Inwagen (1998) (to which we will later return).

We now argue, by consideration of and extrapolation from certain illustrative cases discussed in Wilson (1982, 2006), that modal indeterminacy is plausibly widespread, that a conceiving-based modal epistemology does not have resources to satisfactorily overcome such indeterminacy, and that an abduction-based modal epistemology does have such resources. We close the discussion of this issue by making explicit that van Inwagen's modal skepticism relies on the supposition that modal epistemology must proceed by way of conceiving—a supposition which, happily enough, we are now in position to reject.

5.1.1 Modal indeterminacy and arbitrary determination

Wilson (1982, 2006) argues that our dispositions to apply predicates can be determined by arbitrary factors (here, following Wilson, we focus on predicates, not concepts). In an illustrative case, he describes a fictional tribe encountering an airplane for the first time. He stipulates that whether they first see the airplane flying in the sky or rather first see it stationary on the ground determines whether they will be disposed to apply 'bird': if they first see the plane in the air, they will be disposed to apply 'bird' to the plane, but if they first see the plane on the ground, they will rather be disposed not to apply 'bird' and rather to apply 'house' to the plane. Once fixed, the dispositions of the tribespeople remain the same: if they first see an airplane flying and then see one grounded, they call each 'bird', but if they first see an airplane grounded and then see one flying, they call each 'house'.

In this case, an arbitrary state of affairs determines the tribespeople's disposition to apply 'bird' (or not) to airplanes, and hence (on the assumption that such dispositions are reliable guides to extensions—a point to which we will later return) the predicate as containing (or not containing) airplanes in its extension. But if the extension of a given predicate can be determined by such arbitrary factors, then, Wilson plausibly surmises, the predicate must have been indeterminate antecedent to the encounter with the arbitrary factor—in particular, indeterminate concerning whether airplanes were in the extension of the predicate, or not. Wilson moreover speculates that such cases are widespread.

5.1.2 Conceiving-based responses to modal indeterminacy

How might a proponent of a conceiving-based modal epistemology treat such modal indeterminacy?

As we note in Biggs and Wilson (2017a), the options aren't great. One strategy, found in Chalmers (1996), is to maintain that such indeterminacy is "no problem" for

a conceiving-based modal epistemology.¹⁸ Such a response might be feasible if there weren't much modal indeterminacy (though if, as we will later argue, an abductive modal epistemology could overcome even this much indeterminacy, that would still be an advantage, since enabling more modal knowledge). But there is reason to think that cases of Wilson-style modal indeterminacy are widespread, with natural kind terms such as 'acid', 'mass', and 'planet' providing just one ubiquitous source of such indeterminacy. Resting with such indeterminacy would thus incur widespread failure of modal knowledge.

A second strategy, also found in Chalmers (1996), aims to resolve Wilson-style indeterminacy by taking the different arbitrary factors to correspond to "different ways for the actual world to turn out"; once having then conceived of the actual world as having turned out a certain way, the extension of the predicate in different situations could then proceed by way of conceiving, as per usual. In Wilson's case, for example, Chalmers says that one "might try to classify these two different scenarios [airplane first seen in the sky or on the ground, respectively] as different ways for the actual world to turn out ..." (p. 364). On this strategy, the predicate 'bird' includes planes in its extension if the actual world is one where tribe members first see a plane overhead, and the predicate 'bird' does not include planes in its extension if the actual world is one where tribe members first see a plane on the ground.

We see two concerns with this proposed conceiving-based resolution of modal indeterminacy. First, as we observe in our (2017a), we take the deeper lesson of Wilson-style cases to be that the influence of accidents cannot be foreseen, for there's no guarantee that (duplicates of) tribes in exactly the same circumstances would stably apply (or not apply) 'bird', even relative to the same historical facts. After all, there are any number of respects of dissimilarity between airplanes and birds, even when the former are in flight, and a minor difference in attention to these features might result in a different decision about whether 'bird' applies. We can register, post-hoc, extensions resulting from decisions that have in fact been made, but even so, we have reason to be suspicious of claims that these results are antecedently available via conceiving alone.

Second—and here we identify a more serious problem for a conceiving-based resolution of modal indeterminacy—the upshot of the suggestion that arbitrary factors can be treated, on a conceiving-based account, as corresponding to 'different ways for the actual world to turn out' is to multiply predicates in a way which renders meaning drastically unstable.

To start, note that the suggestion entails that the predicate 'bird' has different meanings, dependent on which arbitrary factor is encountered or, correspondingly, which way the actual world turns out to be. It is useful here to compare the case of 'water': if the actual world had turned out to be one where XYZ was the dominant watery substance, then the extension of 'water' would not have contained H₂O, in which case the meaning of 'water' would have been different from the meaning it actually has. Since predicates are individuated by their meanings, 'water' in such a world would be a different predicate than 'water' in this world. Similarly, on the present proposal, the meaning of 'bird' given that the actual world is one where tribespeople first encounter

¹⁸ As Chalmers puts it: "There may of course be borderline cases in which it's indeterminate whether a concept would refer to a certain object [...] This is no problem: we can allow indeterminacies [of this sort] as we sometimes allow indeterminacies in reference in our own world" (p. 364).

an airplane on the ground will be different from the meaning of ‘bird’ given that the actual world is one where tribespeople first encounter an airplane in the air; hence the basic strategy for resolving modal indeterminacy in what appears to be a single predicate is to take it to actually correspond to multiple predicates.

Now, such a multiplication of predicates strikes us as problematic, since as we’ll now argue, it will result in a drastic instability in meaning. To prefigure: the instability at issue is a function, in part, of a *disanalogy* with the case of ‘water’. In that case, the ways the actual world could have turned out to be are relevantly incompatible: either the actual world turns out to be one where water is H₂O, or it doesn’t. In Wilson’s ‘bird’ case, however, the situations corresponding to different arbitrary determinations of the predicate aren’t really incompatible; and this will give rise to a drastic instability of meaning, as follows.

To start, consider the following situation, which the proponent of a conceiving-based modal epistemology should grant makes sense. Prior to any of Wilson’s tribespeople encountering an airplane, one tribesperson, Frank, considers whether birds could have been made of metal. He proceeds by imagining an airplane flying high in the sky. He finds himself unequivocally disposed to call such an object ‘bird’, and thus concludes that birds could have been made of metal. Another tribesperson, Gina, considers whether houses could have been made of metal. She proceeds by imagining an airplane on the ground. She finds herself unequivocally disposed to call such an object ‘house’, and thus concludes that houses could have been made of metal. Frank and Gina create paintings of their imagined objects. Frank titles his ‘Metal Bird’. Gina titles hers ‘Metal House’. Each painting depicts an airplane, although one is in the sky and the other on the ground. When they share their paintings, Gina says that Frank must be mad to apply ‘bird’ to what is clearly a flying house, and Frank says that Gina must be mad to apply ‘house’ to what is clearly a grounded bird. A vigorous debate ensues.

How should the proponent of a conceiving-based account characterize this dispute? They cannot plausibly maintain that Frank and Gina’s uses of ‘bird’ differ and always have differed, although the difference went unnoticed until the decisive case arose; for *ex hypothesi*, Frank would have applied ‘house’ but not ‘bird’ to airplanes if he had first imagined them grounded, and Gina would have applied ‘bird’ but not ‘house’ to airplanes if she had first imagined them flying. Nor can they plausibly maintain that one of Frank or Gina is right, and the other wrong. For on a conceiving-based approach, the ultimate guide to the extension of a predicate in a given situation lies with the dispositions of the conceiver to apply or not apply the predicate in the situation; and in the case at hand both Frank’s and Gina’s conceiving-based dispositions are on a par.

The remaining option, then, is to apply a variation of the Chalmers-style suggestion to the case at hand, maintaining that Frank and Gina’s uses of ‘bird’ were each indeterminate antecedent to their imaginings, and afterwards became determinate (at least with respect to airplanes) and determinately *different*, since Frank’s predicate ‘bird’ now includes, while Gina’s predicate ‘bird’ now excludes, airplanes.

But this diagnosis suggests, implausibly, that meaning is highly unstable, since in cases of modal indeterminacy there are situations one might imagine (or encounter) that will result in what is intuitively a single predicate becoming multiplied into distinct

predicates and associated meanings. Hence while Frank and Gina plausibly meant the same thing by ‘bird’ antecedent to their different imaginings, after these imaginings their predicates do not mean the same thing, as is reflected in their disagreement.¹⁹ More generally, this diagnosis suggests that for any modally indeterminate predicate, different acts of encountering or even just conceiving of situations involving the sort of arbitrary factors operative in Wilson-style cases is enough to result in multiple predicates. Now, for any such modally indeterminate predicate, we should expect users to encounter or imagine different such situations, in ways resulting in the predicate’s multiplying, with each new predicate associated with a different extension. Such rampant instability of meaning would be, we take it, clearly problematic. Accordingly, this strategy is undesirable.

Indeed, Chalmers (2012) is now inclined to think that the modal indeterminacy in Wilson-style cases may be insuperable, saying that in such cases, it “is plausible” that “later extensions [of the predicates at issue] depend on idiosyncratic developments, and verdicts about such cases are not determinately prefigured in a user’s original use of an expression” (p. 231). Chalmers makes this concession in the course of a discussion in which he is concerned to show that widespread indeterminacy would not undermine the claim that an idealized conceiver in possession of the fundamental facts at a world would be in position to infer the non-fundamental facts at that world, as per what he calls the ‘scrutability thesis’; effectively, Chalmers’s strategy here is to maintain that when a predicate is insuperably (by lights of a conceiving-based account) modally indeterminate, relevant statements having that predicate as a constituent will also be indeterminate, and so not in need of being scrutated, to coin a phrase. The fact remains, however, that any such insuperable modal indeterminacy will render many associated modal claims unknowable, and hence count against a conceiving-based modal epistemology—at least if an abduction-based modal epistemology can do better, as we’ll now argue it can.²⁰

5.1.3 An abduction-based response to modal indeterminacy

How might an abduction-based modal epistemology treat modal indeterminacy in Wilson-style cases? To start, regardless of whether we first encounter or imagine an airplane flying or rather on the ground, we can consider whether or not extending ‘bird’ to airplanes would lead to more fruitful theorizing, a more parsimonious ontology, more theoretical unification, and so on. Accordingly, if modal reasoning proceeds by way of abduction, then we can consider whether or not we should extend ‘bird’ to airplanes: if (on balance) extending ‘bird’ to airplanes would better satisfy relevant abductive principles, then we should do so, and if (on balance) extending ‘bird’ to

¹⁹ The fact that this bifurcation is compatible with ‘bird’ having a ‘stable primary intension’, understood as a function from worlds considered as actual to extensions (where, on the original suggestion, a world where one first encounters a plane on the ground is considered a different actual world than a world where one encounters a plane in the air) does nothing to alleviate the present concern, since Frank and Gina occupy the same world.

²⁰ Yet more recently, Chalmers (2014) briefly suggests that he now prefers to retain a fully general scrutability thesis by shifting the indeterminacy at issue to scrutability itself. This new stance is underdeveloped but we see no reason to think that it can improve his position in the present dialectic.

airplanes would not better satisfy relevant abductive principles, we should not do so—all regardless of what we happen to encounter or imagine along the way. Accordingly, both before and even after Frank and Gina have had their dispositions to apply ‘bird’ fixed by their respective imaginings, and so regardless of what dispositions they have (or lack), using abduction would allow them to assess how they should apply ‘bird’, whether to airplanes or anything else. Perhaps in some cases, the result of abductive deliberation might be to take divergent dispositions to be associated with different predicates (concepts). But if, as in the Frank and Gina case, and as in the cases of debates over the extension of natural kind terms—‘acid’, ‘mass’, ‘planet’—we are rather inclined to see the debate as concerning what meaning should be assigned to a single predicate, abductive reasoning also provides the resources to be able to do this. Hence, just as scientists decided that it made sense, all things considered, to allow HCL into the extension of ‘acid’, so could Frank and Gina decide, after individual or joint abductive consideration—as they presumably would—that airplanes should not be included in the extension of ‘bird’ (and perhaps not in the extension of ‘house’, either). Consequently, if modal reasoning proceeds by way of abduction, then modal indeterminacy can be resolved without inducing rampant instability.

One might be concerned that, even if abduction can provide a principled basis for overcoming modal indeterminacy, it would remain that potentially widespread modal indeterminacy would remain antecedent to such abductive deliberations, with the consequence that until the end of the abductive day, so to speak, there would be a correspondingly large failure of modal knowledge. Here we observe two points. First, even if this is correct, it would remain that, for any case of modal indeterminacy that is resolved, an abduction-based modal epistemology does better than a conceiving-based modal epistemology in that it can (where appropriate) resolve the indeterminacy without being forced to multiply predicates (concepts) in a way introducing rampant instability of meaning. Second, the proponent of an abduction-based modal epistemology can reasonably maintain that as a matter of fact, there is not really any modal indeterminacy, since the content of any given predicate/concept can be determined at any time through abduction, and hence in this sense is always determinate.

5.1.4 Overcoming modal skepticism

van Inwagen (1998) argues from the premise that many concepts/terms are insuperably modally indeterminate to a strong form of modal skepticism. As we will see, however, his argument relies on the supposition that modal epistemology proceeds by way of conceiving, and drawing on the previous results, an abduction-based approach has the resources to block his skeptical conclusion.

To start, van Inwagen’s skepticism is not global. He accepts that we can know modal claims about mundane matters. He denies, nonetheless, that we can know modal claims about “circumstances remote from the practical business of everyday life” (p. 70). Since he thinks that most philosophically interesting claims involve such remote circumstances, he concludes that philosophically interesting modal knowledge is (mostly) unattainable.

His argument begins with an analogy. Although “judgments of distance made by eye” can be “pretty accurate” across “a wide range of circumstances”, they go awry

when made about “circumstances remote from the practical business of everyday life”, as when judging the distance of the moon (p. 70). Similarly, “non-inferential” modal judgments tend to be “pretty accurate” if they involve mundane matters, such as whether a table could be (or could have been) located a few feet away from where it is, but go awry when made about remote circumstances, such as those supposedly including a physical/functional duplicate of an ordinary person who nonetheless lacks some mental features that person in fact has.

With this analogy in place, van Inwagen argues as follows. Since philosophically interesting claims involve such remote circumstances, they are either unknowable or knowable only inferentially. Conceiving, which proceeds by imagining possible cases, is the best candidate for a mode of inference for justifying philosophically interesting modal beliefs. Unfortunately, we cannot determine whether philosophically interesting possible cases are imaginable:

To my mind, philosophers who are convinced that they can hold, say, the concept of transparent iron before their minds and determine whether transparent iron is possible by some sort of intellectual insight are fooling themselves. (They could be compared to an inhabitant of the ancient world who was convinced that he could just see that the moon was about thirty miles away.) (p. 71)

Consequently, we cannot establish philosophically interesting modal claims: given the limits of insight and imagination, we have no way to determine the extensions of our terms/concepts at possible cases that are “remote from the practical business of everyday life”.

This objection is compelling as an objection to a conceiving-based modal epistemology. The concern, in effect, is that many concepts/terms are modally indeterminate in ways that conceiving cannot overcome. As a motivation for modal skepticism, however, the objection is inadequate, absent support for van Inwagen’s claim that conceiving is the best candidate for a mode of inference capable of justifying belief in philosophically interesting modal claims. van Inwagen provides no support for this claim, however, beyond the value of his impression. In particular, he says nothing at all about abduction as an alternative mode of such inference. And as we have seen, we have good reason to think that conceiving, being merely clarificatory, is not the best candidate for a mode of inference to conclusions that are to some extent ampliative.

Indeed, van Inwagen unintentionally motivates attention to an abduction-based modal epistemology as an alternative to accepting modal skepticism when he says, in presenting his core analogy, that “[p]eople had no idea about how far away the sun and the moon and the stars were till they gave up trying to judge celestial distances by eye and began to *reason*” (our italics, p. 70). This and related cases suggest that modal reasoning about “circumstances remote from the practical business of everyday life” should proceed by way of whatever method allowed us to discern celestial distances. Conceiving is obviously not that method. Rather, this method relies on an ampliative mode of inference—most plausibly, abduction.

van Inwagen’s argument for modal skepticism thus reinforces the lessons we should learn from Wilson’s and related cases: insuperably modally indeterminate terms/concepts, and correspondingly unknowable modal statements/claims, are

widespread if modal reasoning proceeds by way of conceiving, but are not widespread if modal reasoning proceeds by way of abduction. Since more modal knowledge is better than less, this gives us reason to prefer an abduction-based modal epistemology to a conceiving-based modal epistemology.

5.2 Identifying incorrect dispositions

Another threat to an adequate modal epistemology concerns cases where we are not in position to determine which of our dispositions to apply a concept are incorrect.

Such a concern is operative in Kant's discussion of definition, which might be seen as suggesting that *all* empirical concepts are such that, even if there is a fact of the matter about the correct extension of the concept in any given situation, we will often fail to be in position to determine what this is. When Kant claims that "an empirical concept cannot be defined at all", his concern is not merely that we cannot produce explicit analyses in which the *definiens* provide nomologically necessary and sufficient conditions for the *definiendum* (pp. 637A 727).²¹ Rather, his concern is that our dispositions to apply empirical concepts may be in error, due to our being unable to distinguish mere (actually) reference-fixing 'marks' from genuinely (counterfactually) definitive 'marks', a failure reflected in cases where one might "sometimes think more of these marks but another time fewer of them". For example, "in the concept of gold one person might think, besides its weight, color, and ductability, its property of not rusting, while another might know nothing about this" (pp. 637–638, A 727–728). Put another way, one person might be disposed to apply the concept *gold* (in any possible case) only to entities that do not rust, while another might be disposed to apply the very same concept (in some possible case) even to entities that rust. Determining whether not-rusting is definitive of gold requires determining which of these dispositions correctly reflects the content of *gold*. But, Kant thinks, we have no way to make this determination. To be sure, one person's disposition has been fixed by knowledge (here, that gold does not rust) that the other lacks, but we have no way to know—and this is the crucial point, according to Kant—whether this additional knowledge leads one to form a correct disposition or instead to form a disposition to mistake a mere accidental property for an essential property. If Kant is right, we can never identify an empirical concept's extension in possible cases that differ relevantly from the actual world.²²

On pain of eliminating all modal knowledge, at least of broadly natural goings-on, we need some way to address Kant's concern. With a similar concern in mind, Melnyk (2008) considers a strategy whereby the proponent of a conceiving-based

²¹ Kant also thinks that we cannot define non-mathematical a priori concepts—the exception being "arbitrarily thought" concepts (i.e., those with entirely stipulated content) (p. 638, A 729). We only address empirical concepts here.

²² Similarly, Kant says, "when, e.g., water and its properties are under discussion, one will not stop at what is intended by the word "water" but rather advance to experiments, and the word, with the few marks that are attached to it, is to constitute only a designation [i.e., an actually reference-fixing mark] and not a concept of the thing [i.e., a counterfactually stable mark]; thus the putative definition is nothing other than the determination of the word" (p. 638, A 728).

modal epistemology might aim to identify which dispositions to apply a given concept are ‘concept-constituting’—i.e., correct:

[O]ne can distinguish concept-constituting mental dispositions from other mental dispositions by [...] attending to what one can conceive. Presumably one can do so in this way because a concept-constituting mental disposition just is a mental disposition that stands in a certain relation to something that one cannot conceive. Corresponding to each mental disposition is a generalization, and a disposition is a concept-constituting one iff you cannot conceive a counterexample to its corresponding generalization. Thus, imagine you’re disposed to apply SWAN only to birds. Because (say) you cannot conceive of a swan that’s not a bird, your disposition is a concept-constituting disposition. (276)

But this proposal fails. To start, we observe, it provides no guidance for addressing Kant’s concern; for someone who is disposed to apply *gold* only to entities that do not rust would be unable to conceive of rusty gold, whereas someone lacking this disposition would take rusty gold to be conceivable. As such, considering whether disputants can conceive of a counterexample to their disposition’s generalization would provide no insight into which dispositions are correct of *gold*.

Moreover, as Melnyk eloquently argues, because false beliefs, no less than true beliefs, can impact our dispositions to apply a concept, being unable to conceive of a counterexample to a disposition’s generalization does not ensure that the disposition is concept-constituting:

Consider a chef, with much experience and practical knowledge of vinegar, who reads an ill-informed website on the chemistry of cooking and as a result becomes fully (but erroneously) convinced that vinegar is the very same stuff that chemists call “formic acid”. So the chef gains a disposition to apply VINEGAR only to stuff that’s formic acid. Furthermore, he can’t conceive a counterexample to the generalization that corresponds to this new mental disposition: he can make nothing at all of the idea that a bottle is full of vinegar and yet contains no formic acid [...] Now, if having a mental disposition while being unable to conceive a counterexample to its corresponding generalization guarantees that the disposition is a concept-constituting one, it follows that the chef’s disposition to apply VINEGAR only to formic acid is concept-constituting. But in fact this disposition isn’t concept-constituting, because vinegar isn’t formic acid, and hence doesn’t have to be; and it can hardly be a requirement on possessing VINEGAR that one think vinegar must be something that in fact it isn’t. So the notion that having a mental disposition while being unable to conceive a counterexample to its corresponding generalization guarantees that the disposition is a concept-constituting one yields the wrong result.²³ (276)

²³ Perhaps if the chef learns that he has often applied *vinegar* to acetic acids, he will recognize an inconsistency in his dispositions. But conceiving cannot resolve this intrapersonal inconsistency any more than it can resolve the interpersonal inconsistency between a person who is disposed to apply gold only to non-rusty metals and one who is disposed to apply gold to some rusty metal; in neither case does the mere existence of inconsistency reveal which disposition should be rejected.

Kant notes that, in principle, the true belief *gold does not rust* can impact one's dispositions to apply gold such as to render these to some extent incorrect. Melnyk notes that the false belief *vinegar is formic acid* can impact one's dispositions to apply vinegar such as to render these to some extent incorrect. The general point is the same: since psychological factors that do not track our concepts' contents can impact our dispositions to apply concepts, even when we are thinking quite clearly, we should not expect those dispositions to invariably track the content of a concept.

Should we conclude, with Kant, that "an empirical concept cannot be defined at all"? No. Kant's pessimistic line of thought, like Melnyk's, is directed at a view on which the identification of the extensions of our concepts in non-actual situations proceeds by way of conceiving. If modal epistemology proceeds instead by way of abduction, then when considering whether gold applies to rusty metal in some possible case, we can move beyond our dispositions, comparing the explanatory value of the claim *rusty gold is possible* to that of the claim *rusty gold is impossible*, and more generally comparing the explanatory value of theories implying these claims. Among the explananda here will be the seeming fact that actual gold never rusts. Perhaps one theory of this seeming fact invokes contingent laws of nature, thus implying that rusty gold *is possible* (assuming that gold can exist in worlds with different laws). Perhaps another appeals to certain facts about the constitution of gold, which rule out even the metaphysical possibility of rusty gold. Of course, comparing the explanatory values of these competing modal claims and associated theories won't help if neither of them has any explanatory value; but we see no reason to be pessimistic on this score. After all, explanatory comparisons of just this sort are the heart and soul of metaphysical, and more generally philosophical, debate—a point to which we will return in our final section.

5.3 Accommodating and resolving substantive disagreement

Recall Frank and Gina. Because Frank first imagined (i.e., conceived of) an airplane flying, he is disposed to apply 'bird' to airplanes. Because Gina first imagined (i.e., conceived of) an airplane grounded, she is disposed not to apply 'bird' to airplanes. So, if conceiving is the ultimate arbiter of the extensions of our predicates or concepts in situations, as per a conceiving-based modal epistemology, there is, as previously argued, little recourse here but to allow that, post-imaginings, their predicate 'bird' is homonymous, and their apparent disagreement about the extension of 'bird', however vigorously they debate, is no disagreement at all. They are simply talking past each other. Moreover, if Wilson (1982, 2006) is right that Wilson-style modal indeterminacy is widespread, as we think cases such as 'acid', 'mass', and 'planet' show he is, and if (as the proponent of a conceiving-based account will maintain) the proper response to widespread modal indeterminacy (and the associated threat to modal knowledge) appeals to conceiving, then the case of Frank and Gina suggests, more generally, that any conceiving-based resolution of widespread modal indeterminacy will render merely verbal what are intuitively substantive disagreements about the extension of the expression. By way of contrast, if modal reasoning proceeds by way of abduction, then we can determine the extensions of our predicates across possible cases independently

of dispositions whose determination reflects what we arbitrarily happen to encounter or imagine; hence an abduction-based modal epistemology is able to resolve modal indeterminacy in a way that does not lead to homonymy, and which can accommodate substantive disagreement about the modal profile of the expression or concept.²⁴

We now highlight other ways in which a conceiving-based modal epistemology fares worse than an abduction-based modal epistemology so far as providing a basis for the accommodation—and resolution—of substantive disagreement.

To start, popular philosophical positions are flatly incoherent given a conceiving-based modal epistemology. Consider, following our running example, dispute over the possibility of zombies. In their impressive survey of philosophers, Bourget and Chalmers (2014) found that a plurality of respondents (36%) claimed that zombies are conceivable but not (metaphysically) possible. If conceiving is the ultimate arbiter of modal disputes, then both this position and the corresponding (equally popular) stance on the mind-body problem (i.e., a posteriori physicalism) are flatly incoherent. If, instead, abduction is the ultimate arbiter of modal disputes, then these positions are live options, to be assessed through abduction.

Relatedly, a wide range of apparently significant arguments are, by lights of a conceiving-based modal epistemology, unimportant distractions. Philosophers often advance their preferred position on the mind-body connection, from interactionist dualism to token identity theory, on grounds that it allows the most plausible account of mental causation. Shoemaker even suggests that mental causation is “at the heart of the mind-body problem” (Shoemaker 2000/2001, p. 74). These philosophers are, in effect, invoking a principle of consilience as relevant to choosing between competing theories of the mind-body connection. If conceiving is the ultimate arbiter of disputes about modal claims, then it is foolishly circuitous to invoke a principle of consilience (or to mention mental causation at all!) when choosing between, say, interactionist dualism and token identity theory: one should, instead, cut to the chase and determine whether zombies are conceivable, eliminating dualism (interactionist or epiphenomenalist) if they are not, and eliminating identity theory (token or type) if they are. If, instead, abduction is the ultimate arbiter of modal disputes, then these arguments are part of the process by which such theory choice appropriately proceeds.

This point extends to other appeals to abductive principles as a way to choose between competing modal claims (or theories implying such claims), such as Hill’s and McLaughlin’s claim that we should endorse physicalism because “reasons of overall coherence and simplicity [...] support the view that by identifying sensory states with their nomologically correlated brain states, we thereby achieve the best explanation of these nomological correlations” (1999, p. 451). More generally, whenever one performs a cost-benefit analysis when choosing between competing modal claims (or

²⁴ Attempts to explain modal disagreement within a conceiving-based modal epistemology substantiate this result. Such attempts either suggest that nearly all modal disagreement is merely verbal [as per, e.g., Chalmers (2012), Yablo (1993)] or else embrace abductive principles as relevant to deciding modal disputes. For example, Geirsson (2005) suggests that those who disagree about the extension of a predicate at a scenario should appeal first to consilience, determining whether some background belief generates the dispute, and then to simplicity, among other abductive principles, so that when “factual or other investigation does not settle the differences”, perhaps disputants “should evaluate their scenarios in a similar way as scientists evaluate theories; by looking at such issues as simplicity and, when applicable, predictability in addition to consistency and coherence” (p. 299).

theories implying such claims), then by lights of a conceiving-based modal epistemology one is wasting precious time, whereas by lights of an abduction-based modal epistemology one is proceeding exactly as one should.

Consider next how we should diagnose modal disputes given each modal epistemology. Given a conceiving-based modal epistemology, modal reasoning is not ampliative; in Kant's terms, its results are "judgments of clarification" rather than "judgments of amplification". Accordingly, a conceiving-based modal epistemology implies that at least one party to any modal dispute fails to understand the claims at issue. Take, for example, the dispute between Moody (1994) and Dennett (1995) about the possibility of zombies. If modal reasoning proceeds by way of conceiving, then at least one of Moody and Dennett is so deeply muddled that he fails to understand the claim *zombies are possible*. By contrast, if modal reasoning proceeds by way of abduction, then their disagreement need not indicate such a basic failure of understanding.

Consider, finally, how we should proceed in the face of disagreement given each modal epistemology. If conceiving is the ultimate arbiter of modal disputes, then Moody and Dennett have reached an impasse as soon as they make competing claims about what is conceivable. They might stare at the other incredulously, wondering how someone so seemingly competent could exhibit such an obvious failure of understanding. They might decide that they are having a mere verbal dispute, happily granting that each expresses a true claim concerning the modal status of 'zombies' in his preferred vocabulary. But neither can hope to persuade the other, at least not rationally.

If, instead, abduction is the ultimate arbiter of modal disputes, then Moody and Dennett can react, as people in fact often do, by exploring the wide range of considerations that count for or against the possibility of zombies. Perhaps, at the end of the day, with all considerations fully explored, Moody and Dennett will still reach an impasse. Perhaps not—insofar as they agree on relevant abductive principles, weighting for those principles, relevant background information, and so on, they should converge on the same theory (or range of theories). Either way, by using abduction rather than conceiving they will be in position to advance the dialectic, both by locating the source of their disagreement (in some background belief, the value assigned to some abductive principle, the application of some abductive principle, etc.), and by more thoroughly measuring the (explanatory) costs of their respective beliefs.

These considerations, we maintain, provide yet another reason to prefer an abduction-based modal epistemology to one rather based in conceiving. A posteriori physicalism should not be ruled out of court. Arguments addressing the accommodation of mental causation should be considered when theorizing about the mind-body problem. Modal disagreement should not always indicate that at least one party does not understand what is being said. And disputants should not take any disagreement about what is conceivable to spell the end of discussion.

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