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The a priority of abduction

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Abstract Here we challenge the orthodoxy according to which abduction is an a posteriori mode of inference. We start by providing a case study illustrating how abduction can justify a philosophical claim not justifiable by empirical evidence alone. While many grant abduction's epistemic value, nearly all assume that abductive justification is a posteriori, on grounds that our belief in abduction's epistemic value depends on empirical evidence about how the world contingently is (e.g., parsimonious, or such that more parsimonious theories better track truth). Contra this assumption, we argue, first, that our belief in abduction's epistemic value is not and could not be justified a posteriori, and second, that attention to the roles experience plays in abductive justification supports taking abduction to be an a priori mode of inference. We close by highlighting how our strategy for establishing the a priority of abduction positively contrasts with strategies in Bonjour (In defense of pure reason. Cambridge University Press, New York, 1998), Swinburne (Epistemic justification. Claredon Press, Oxford, 2001), and Peacocke (The realm of reason. Oxford University Press, Oxford, 2004) aiming to establish the a priority of certain ampliative modes of inference or abductive principles.

Keywords Abduction · Inference to the best explanation · Epistemology of modality, identity, and essentiality · Philosophical method · A priority · Parsimony

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1 Introduction

Abduction, or inference to the best explanation, is an inferential procedure that proceeds by assessing the extent to which each of a range of candidate theories satisfies certain abductive principles ('theoretical virtues'), such as principles of ontological parsimony, ideological simplicity, elegance, plausibility, compatibility with other beliefs, and so on. To use abduction when deciding among competing theories is to infer to the truth of (or justified belief in) the theory that best explains some target explanandum, where the underlying abductive principles and their weightings determine how theories are to be ranked. As Harman (1965) describes the procedure:

> In making this inference one infers, from the fact that a certain hypothesis would explain the evidence, to the truth of that hypothesis. In general, there will be several hypotheses which might explain the evidence, so one must be able to reject all such alternative hypotheses before one is warranted in making the inference. Thus one infers, from the premise that a given hypothesis would provide a "better" explanation for the evidence than any other hypothesis, to the conclusion that the given hypothesis is true. (…) Such a judgment will be based on considerations such as which hypothesis is simpler, which is more plausible, which explains more, which is less ad hoc, and so forth. (89)

It is nearly universally presumed that abduction is an a posteriori mode of inference. Here we challenge this orthodoxy. We start by considering how philosophical claims pertaining to necessity, essentiality, and identity might best be justified, given that such claims appear to go beyond the empirical evidence; we register concerns about whether existing (intuition- or conceiving-based) modes of a priori deliberation can justify such claims, and present a case study supporting the increasingly common supposition that abduction can do so (Sect. 2). Though philosophers often grant that abduction can justify philosophical claims, they nearly universally assume that abduction is an a posteriori mode of inference, on grounds that our justification for thinking that abduction has epistemic value (roughly: results in justified beliefs; a more specific definition follows) depends on (what we might call) 'indirect' empirical evidence, pertaining to how the world contingently is (e.g., parsimonious, or such that more parsimonious theories are more likely to be true). Contra this line of thought, we argue that no empirical evidence—direct or indirect, actual or hypothetical—is or could be relevant to assessing the epistemic value of abductive principles (e.g., parsimony), or more generally, of abduction, concluding that our justification for the belief that abduction has epistemic value is not a posteriori (Sect. 3). We then argue that our justification for this belief is a priori, by identifying the roles that experience can play in forming a justified belief, and considering the bearing of such roles on whether a given belief is justified a priori or a posteriori (Sect. 4). We close by highlighting how our strategy for establishing the a priority of abduction contrasts with strategies in Bonjour (1998), Swinburne (2001), and Peacocke (2004) that aim to establish the a priority of certain ampliative modes of inference or abductive principles, and showing that our account is not subject to certain concerns with these accounts (Sect. 5).

Four preliminary clarifications. First, we use 'abduction' as a label for 'inference to the best explanation' for the sake of simplicity, not to imply that inference to the best explanation just is Peirce's abduction.[1]

Second, we take a mode of inference *M* to have epistemic value if necessarily, for any subject *s*, conclusion *C*, and premise(s) *P*: if *s* justifiably believes *P* and uses *M* to infer *C* from *P*, then (absent defeaters) *s* justifiably believes *C*. Nothing in what follows depends specifically on epistemic values' involving justified belief; those taking knowledge, entitlement, warrant, or some other epistemic feature to enter more basically into what Beebe (2009) calls the "epistemic goodness of [a given mode of] inference" (619) can substitute accordingly.

Third, in what follows we set aside general skepticism about abduction. We assume that we are actually justified in believing that abduction has epistemic value, and aim here to establish (among other results) that our justification for believing this is a priori.[2] We see this as dialectically reasonable, given the popularity of and seeming need for abduction both in the sciences and in philosophy (for which we provide further support in Sect. 2), as per Lipton's claim that "Inference to the Best Explanation is a popular account" of inference (1991/2004, 1), Ladyman's claim that "naturalists must agree that inference to the best explanation is indispensable in science" (2007, 184), and Hawley's claim that "rejection of inference to the best explanation … is incompatible with standard versions of scientific realism" (2006, 454).[3]

Fourth, we do not take any stand here on exactly how abduction works, beyond the sort of rough sketch that Harman provides, and the presupposition that principles such as ontological parsimony and compatibility with existing beliefs are among the abductive principles. Our case for abduction's being an a priori mode of inference is compatible with a wide range of competing views about which principles are among the abductive principles, how abductive principles are to be weighted, how abduction relates to other forms of inference, and so on.[4]

2 How are philosophical claims justified?

Philosophers often attempt to discern whether certain claims are necessary or contingent, whether certain properties of an object are essential or accidental to that object, whether certain spatiotemporally coincident entities are identical or distinct, and so on. On the face of it, empirical evidence alone does not provide a justificatory basis for

[1] For reasons to distinguish Peircean abduction and inference to the best explanation see, e.g., Minnameier (2004), Campos (2011), Plutynski (2011), and Mackonis (2013).

[2] For arguments that abduction has epistemic value see, e.g., Lipton (1991/2004) and Weintraub (2013); for arguments that abduction lacks epistemic value see, e.g., van Fraassen (1980, 2002).

[3] Skeptics may nonetheless be interested in our reasons for thinking that the belief that abduction has epistemic value cannot be justified a posteriori.

[4] For consideration of the principles at play in abduction see, e.g., Thagard (1978), Lipton (1991/2004), Beebe (2009) (esp. 609–611), and Mackonis (2013). For attempts to formalize some abductive principles see, e.g., McGrew (2003) and Shupbach and Sprenger (2011). For competing views on how abduction relates to other forms of inference see, e.g., Harman (1970), van Fraassen (2002), Weisberg (2009), and Henderson (2014).

such claims, since it does not distinguish between the features at issue: experience can tell us that Socrates is mortal, but not whether this is necessary or contingent; it can tell us that Ruth is a philosopher, but not whether this is essentially or accidentally so; it can tell us that water and H_2O are spatiotemporally coincident, but not whether these are identical or distinct. A strict empiricist might conclude that philosophers are wrong to seek answers to questions about necessity, essence, identity, and the like, but we follow those who think that we can provide epistemically principled answers to such questions, even in the absence of decisive empirical evidence.

2.1 Justifying philosophical claims: intuition- and conceiving-based approaches

How can philosophers fill the gap between empirical evidence and claims about necessity, essentiality, and identity (to focus on three especially important philosophical notions)? So far as a priori modes of deliberation are concerned, two options are standardly on offer. On the first, it is supposed that an a priori form of evidence fills the gap, along the lines of Bealer's (2000, 2002) accounts of *intuition* as a non-inferential, a priori form of rational 'seeming', which encodes our insight into the concepts entering into the claim at issue, and which constitutes evidence for claims about necessity, essentiality, and identity. On the second, it is supposed that an a priori mode of inference fills the gap, as with Chalmers and Jackson's (2001) and Chalmers's (2002) account of *conceiving* as an a priori form of rational inference, which takes empirical evidence as input and which—upon consideration of how we (or more specifically: idealized versions of ourselves) would be inclined to apply our concepts in hypothetical scenarios—delivers indefeasible claims about necessity, essentiality, or identity as output.

We find these currently available accounts of a priori deliberation into philosophical questions unsatisfying, for two reasons in particular. First, a priori conclusions based in either intuition or conceiving require that our conceptual competence be such as to eventuate in determinate results in any scenario relevant to assessing the philosophical claim at issue: we must be able to consider whether there are *any* scenarios where our understanding of 'Socrates is mortal' comes apart from our concept of truth, where our concepts of 'Ruth' and 'philosophizing' come apart, where our concepts of 'water' and 'H_2O' come apart. But as has been argued by Wilson (1982, 2006), Block and Stalnaker (1999), Byrne and Pryor (2006), Melnyk (2008), and ourselves (Biggs and Wilson 2016, in progress), our concepts are typically to some extent indeterminate, thus preventing their determinate application in the requisite full range of scenarios using the resources of intuition or conceiving, understood as involving some sort of rational insight into pre-existing conceptual connections, alone.[5] As such, we are inclined to agree with Williamson (2007) that, at the end of the day, "few philosophical questions are conceptual questions in any distinctive sense" (3).

[5] Nor, pace Chalmers, can the requisite ampliative (read: abductive) resources be built into the concepts at issue, without multiplying concepts and introducing other problems (see Biggs and Wilson 2016, in progress).

Second, results based in intuition and conceiving too often leave philosophers at an impasse, reflecting that individuals registering different opinions about what is intuitively true or conceivable have no clear means of resolving their disputes, and hence no clear means of resolving the answers to the original questions about necessity, essentiality, and identity. As Block and Stalnaker (1999) observe, "claims about conceivability seem at least as fragile and fallible as intuitions about what is metaphysically possible" (6). Moreover, and more problematically, there is a kind of 'black box' aspect to these forms of a priori deliberation, which renders differences in claims about what is intuitive or conceivable largely brute, and as such not amenable to reasoned reconciliation.

We are inclined to see these concerns as representing insuperable difficulties for intuition- and conceiving-based approaches to the justification of philosophical claims.

2.2 Justifying philosophical claims: abduction

Luckily, there is a better available approach to the justification of philosophical claims—namely, abduction. It's increasingly common for metaphysicians to characterize philosophical investigations as proceeding by way of this mode of inference.[6] For example, Hawley (2006) argues that abduction can justify beliefs in metaphysics no less than in science, Rayo (2013) argues that abduction can justify beliefs about identity ("just is" statements), Biggs (2011) argues that abduction can justify beliefs about necessity and possibility, and Sider (2009) is explicit that metaphysical investigations generally appeal to abductive principles:

> Competing positions are treated as tentative hypotheses about the world, and are assessed by a loose battery of criteria for theory choice. Match with ordinary usage and belief sometimes plays a role in this assessment, but typically not a dominant one. Theoretical insight, considerations of simplicity, integration with other domains (for instance science, logic, and philosophy of language), and so on, play important roles. (385)

By way of illustration, consider the oft-registered claim that water is identical with H_2O. What justifies, or could justify, this claim? To start, as above, the justification is partly dependent on empirical experience—in particular, on water and H_2O's being actually spatiotemporally coincident.[7] On the other hand, the

[6] This is not to suggest that metaphysicians have only recently characterized philosophy as proceeding by way of abduction. For example, as Fisher (2015) notes, Donald Williams's method for doing metaphysics included "the weighing up of competing hypotheses against a scientific picture of the world, common sense, and a theory's explanatory power and simplicity", such that Williams "can be seen as an early defender of 'inference to the best explanation'" as a method for doing metaphysics (6).

[7] The claim that water and H_2O are actually coextensive (and identical) has been widely (albeit not universally) accepted since Putnam (1962, 1975) and Kripke (1980). As has been observed (in, e.g., Weisberg 2005), however, chemists take H_2O to be a genus that includes a series of distinct isomers among its species, some of which, they say (at least in ordinary contexts), are not water. Supposing, then, that we defer to chemists' usage of 'water' to fix the content of our own uses, water is not coextensive with H_2O. Granting Weisberg's point, it remains that chemists (hence we) might maintain that water is

justification for the identity claim must go beyond this experience, for spatiotemporal coincidence is compatible with different theories about the relation between water and H_2O, including, to start:

Identity: Water is identical with H_2O

and

Distinctness: Water is distinct from H_2O.

Distinctness, in turn, is compatible with various specific accounts of the relation at issue, in terms of constitution, composition, functional realization, the determinate-determinable relation, strong (physically unacceptable) emergence, and so on.

Given these options, why endorse *Identity* rather than some version of *Distinctness*? Going by what philosophers actually do, it will be natural to start by appealing to the abduction-relevant fact that *Identity* is the most *ontologically parsimonious* explanation of the spatiotemporal coincidence, in that it posits a single type, or kind, rather than two or more, as on any version of *Distinctness*. That's not the end of the story, since acceptance of *Identity* on grounds of its providing the most parsimonious explanation of the spatiotemporal coincidence requires that other things be equal—on *Identity* doing as well as or better than *Distinctness* along other abductive dimensions, including consistency, elegance, and compatibility with existing beliefs. And though *Identity* appears to do better than *Distinctness* with respect to some such dimensions (e.g., elegance), that it does so for others (e.g., compatibility with other beliefs) is less clear. For example, if we have reason to think that water is multiply realizable, or that the term 'water', in entering into distinctive special science laws, is naturally seen as picking out a distinctive higher-level property, then a proponent of *Identity* needs to say more. And, indeed, reductionists about special science kinds do address these sorts of concerns in the course of defending their view.[8]

Indeed, notwithstanding common acceptance of *Identity*, this debate isn't over. However the debate eventually plays out, the first point we want to make is that it is very natural to see philosophical investigations into these options as appealing to abduction and associated abductive principles, as Hawley, Rayo, Sider, and others suggest.[9] The second point is that, notwithstanding the provisional status of even

Footnote 7 continued
identical with a particular isomer (or set of isomers) rather than merely spatiotemporally coincident with that isomer (or set of isomers), and run the argument to follow accordingly. For purposes of illustration we stick with the usual identity claim.

[8] For example, a reductionist might aim to accommodate multiple realizability by taking the identity to involve a disjunctive lower-level type (a la Antony 1999) or by embracing species-level type-identities (a la Kim 1972); and a reductionist might reject seeming reference to higher-level types as presupposing an incorrect 'Picture Theory' of meaning (a la Heil 2003).

[9] Ladyman (2007) worries that abduction cannot justify beliefs in metaphysical claims about real entities (e.g., water) because it takes intuitions as its explananda, and those intuitions may not reflect the nature of those entities. But typically the explananda at issue when using abduction to justify philosophical claims will also consist in empirical evidence—e.g., evidence that water and H_2O are spatiotemporally coincident.

commonly endorsed claims such as *Identity*, there is no clear reason to interpret this status as indicating that abductive assessments of philosophical claims are doomed to be inconclusive, as opposed to simply reflecting that we are currently some distance from the end of inquiry (see Biggs and Wilson 2016, in progress). No one ever said that justifying philosophical claims was going to be *easy*—we just don't want it to be insuperably difficult, as it arguably is (due to widespread conceptual indeterminacy, and to brute differences in what is considered intuitive or conceivable) on intuition- or conceiving-based approaches. And though we cannot fully defend these claims here, a case can be made (see Biggs and Wilson 2016, in progress) that abduction, in being an ampliative mode of inference and in involving explicit criteria as opposed to brute intuition- or conceiving-based seemings, has resources both for overcoming conceptual indeterminacy (if it turns out that conceptual connections are ever relevant to abductively justifying philosophical claims) and for allowing disputants to engage in substantive debate.

In what follows, then, we assume, following Hawley, Rayo, Sider and many others, that philosophical claims are justified by appeal to abduction, and that as such, we are actually justified in believing that abduction has epistemic value.

3 Where it is argued that belief in the epistemic value of abduction is not justified a posteriori

Given that we are justified in believing that abduction has epistemic value, is this justification a priori or a posteriori? The nearly universal answer is that this justification is a posteriori: as Douven (2011) says in discussing the status of abduction as having epistemic value, "all defenses that have been given so far are of an empirical nature in that they appeal to data that supposedly support the claim that (in some form) abduction is a reliable rule of inference".[10]

The line of thought underlying this answer seems to be that whether abduction has epistemic value depends on contingent, empirical fact(s) registering that the world is as the abductive principles suggest it to be—e.g., ontologically parsimonious, or such that (other things being equal) ontologically parsimonious theories are likely to be true—and correspondingly, that whether we are justified in believing that abduction has epistemic value depends on whether we are justified in believing that the contingent, empirical facts are as abduction suggests them to be. Hence Sober (1988) says that "Appeal to simplicity is a surrogate for stating an empirical background theory" (64); Bonjour (1998) wonders, "Why, after all, should it be thought … that the world is somehow more likely to be simple than complex?" (91); and Beebe (200?) says, more generally:

> [P]ractically everyone who works on abductive inference believes that such inferences are justified empirically and that the theoretical virtues are broadly empirical and contingent marks of truth. (625)

[10] Depending on what counts as a 'defense', Douven may be overstating the case; see Sect. 5.

We now argue that, notwithstanding this line of thought, the justification for the belief that abduction has epistemic value is not and indeed could not be a posteriori.[11] We illustrate our argumentative strategy by attention to the following principle of parsimony:

> *Parsimony*: For any theories *T* and *T**, and entity *E*: if *T* and *T** differ in that *T** includes *Es* as fundamental but *T* does not, then *ceteris paribus* we should believe *T*.[12]

Our strategy generalizes, *mutatis mutandis*, to other abductive principles, and more generally to abduction itself, understood as constituted by application of these principles.[13] And for short, we sometimes refer to our target (that is, the question whether our belief in the epistemic value of abduction/abductive principles is justified a priori or a posteriori) in simpler terms as concerning whether the epistemic value of abduction/abductive principles is a priori or a posteriori.

We start with two clarificatory points, which will structure what follows. First, note that two different sorts of claim might be seen as entering into the line of thought according to which the epistemic value of abduction (and associated principles) is a posteriori. Applied to *Parsimony*: one claim is that the epistemic value of *Parsimony* depends on whether the world is "simple rather than complex"; the other claim is that the epistemic value of *Parsimony* depends on whether, at the world in question, theories satisfying *Parsimony* are more likely to be true. We address each claim in turn.

Second, as Bonjour (1998) notes, "the precise character of the distinction between a priori and a posteriori justification remains more than a little obscure" (6). A common first pass has it that a belief in a true proposition is justified a priori if it is justified independently of any appeal to experience, and is justified a posteriori if it is justified by at least some appeal to experience. But what sort of experience is at issue? As is familiar, certain kinds of experience—e.g., that required to understand the proposition at issue—play a role even in a priori deliberation, requiring second-pass refinement of the distinction (an issue to which we will return in Sect. 4). We can also ask, however, what sort of experience is at issue in a posteriori justification. This is typically qualified as being 'empirical' or as involving empirical evidence, where the notion of the empirical is tied to in-principle observability or other broadly sensory or causal notions. Hence Bonjour suggests that

[11] Swinburne (2001) and Peacocke (2004) also take broadly abductive applications of (something akin to) the principle of simplicity to be a priori justified. As prefigured, in Sect. 5 we highlight the main points of contrast of our account with these other approaches, as well as with Bonjour's (1998) account of induction as a priori justified.

[12] As above, there are several conceptions of parsimony on offer; we focus on *Parsimony* for simplicity (no pun intended). For discussion of various conceptions of parsimony and related principles, see, e.g., Baker (2003, 2004/2010) and Sober (2003).

[13] Since some principles may be in tension, abduction as a general mode of inference also presumably encodes how these are to be ranked and weighted; we return to this issue at the end of this section.

> the relevant notion of experience should be understood to include any sort of process that is perceptual in the broad sense of (a) being a causally conditioned response to particular, contingent features of the world and (b) yielding doxastic states that have as their content putative information concerning such particular, contingent features of the actual world as contrasted with other worlds. (8)

We will have something along these lines in mind when assessing whether it makes sense to suppose that the epistemic value of *Parsimony* is justified a posteriori, but down the line (by way of an objection to our conclusion that this epistemic value is not justified a posteriori) will consider a more 'metaphysical' conception of the experience or empirical evidence at issue.

To start, then. According to the first claim, the epistemic value of *Parsimony* is a posteriori, in depending on whether the actual world is parsimonious. Now, if what it is for a world to be simple or complex, parsimonious or not, depends on how many fundamental entities there are at a world, then this is presumably something for which we could have empirical evidence. But any such evidence would be irrelevant to the epistemic value of *Parsimony*. How many fundamental kinds (for example) does a world have to contain in order to be unparsimonious? Two? Forty-two? A billion? These questions are silly, precisely because *Parsimony* is a *principle* or a *norm* that guides theory choice, not a *descriptive fact* that holds, or doesn't hold, at a world.[14] Hence even if we could make some sense of its being true that 'A world with a billion fundamental kinds is unparsimonious', that a world had a billion fundamental kinds would be irrelevant to the epistemic value of *Parsimony*. It would still remain, in such a world, that in theorizing one should not posit more fundamental kinds (e.g., one billion and one, in the world at issue) than are needed.

According to the second claim (which some may have had in mind in endorsing the first), the epistemic value of *Parsimony* is a posteriori, in depending on whether, in the actual world, theories satisfying *Parsimony* are more likely to be true. If there were some way to empirically determine, in a world, whether theories satisfying *Parsimony* were more likely to be true, then this would, perhaps, be relevant to the epistemic value of *Parsimony*; in particular, such empirical evidence would, perhaps, be relevant to whether belief in this epistemic value was justified a posteriori.[15] But in any case we could never gain empirical evidence, however 'indirect', to this effect. *Parsimony*, like all abductive principles, requires that 'other things be equal'. Consequently, no empirical evidence could, even in principle, distinguish between a world in which theories satisfying *Parsimony* were more likely to be true, and one where this was not the case. If there were such empirical evidence—if, for example, experiments were to indicate that the world contained more fundamental kinds than our best theory

[14] Nor is *Parsimony* a piece of "information" that might be entailed by base facts at a world, as Chalmers and Jackson (2001) suggest in responding to Block and Stalnaker's (1999) objection that appeal to simplicity considerations is required in order to overcome conceptual underdetermination.

[15] We say 'perhaps' since one might deny that justification (or whatever epistemic good is seen as entering into the characterization of the epistemic value of a given mode of inference) hinges on truth, or likely truth, or any other metaphysical notions.

implies—then the *ceteris paribus* condition in *Parsimony* would not be met: one theory would be explanatorily better than the other (vis-à-vis another abductive principle). We could never be in empirical position to know, then, that the actual world is not cooperating with Parsimony.

The previous considerations suggest that our justification for believing in *Parsimony*'s epistemic value does not and indeed cannot rely on empirical evidence, whether this evidence is supposed to indicate that our world is parsimonious rather than unparsimonious (whatever exactly this comes to), or is rather supposed to indicate that our world is one where more parsimonious theories are more likely to be true. Either way, there is no way to gain such evidence: in the first case, because facts about the number of fundamental entities or kinds at a world are irrelevant to the epistemic value of *Parsimony*; in the second case, because any empirical evidence that might be brought to bear to show that more parsimonious theories are less likely to be true would violate the *ceteris paribus* condition in *Parsimony*, and so again be irrelevant to the epistemic value of this principle. We conclude, then, that

(C1) The belief that *Parsimony* has epistemic value is not actually justified a posteriori.

The same considerations supporting (C1) also serve to show that in any world where we are justified in believing that *Parsimony* has epistemic value, that belief would not be justified a posteriori. In any such world, it would remain that there could be no (hypothetical) empirical evidence that would be relevant to assessing the epistemic value of *Parsimony*, as applied in such a world. Indeed, given that we are actually justified in believing that *Parsimony* has epistemic value, we can provide a further argument for this claim, according to which in reasoning about hypothetical states of affairs, we should apply our actual norms. On this view, there is no more a world where one (epistemically) should implement *Anti-Parsimony* (or otherwise fail to implement *Parsimony*) than there is a world where one (morally) should harm others for fun: the details of the world are irrelevant to what one should do. We can thus drop the reference to 'actually' in (C1), and more generally conclude that

(C2) The belief that *Parsimony* has epistemic value is not justified a posteriori.

Considerations similar to those just canvassed for *Parsimony* hold, *mutatis mutandis*, for other abductive principles—which are also *principles* or *norms* rather than *descriptive facts*, which are *our* norms, and which also include *ceteris paribus* clauses holding other explanatory considerations constant, rendering it the case that no empirical evidence, direct or indirect, actual or hypothetical, could disprove these principles. Since the application of these principles is constitutive of abduction, it follows, more generally, then, that

(C3) The belief that abduction has epistemic value is not justified a posteriori.

In the next Section, we will argue that the belief that *Parsimony* has epistemic value, and more generally the belief that abduction has epistemic value, is moreover justified a priori. Before moving on, however, in the following sub-Section we consider and respond to four objections to what we have claimed thus far.

3.1 Where we respond to objections to the claim that belief in the epistemic value of abduction is not justified a posteriori

The first objection is directed at (C1), and maintains that we can or could actually test whether parsimonious theories tend to be true, and thereby acquire a posteriori justification for or against *Parsimony*, as follows.[16] Take all cases in which *Parsimony* has guided theory choice. Identify the subset in which, at some later time, empirical evidence either confirmed or disconfirmed the theory that *Parsimony* initially supported. Compare the percentage of confirming cases to the percentage of disconfirming cases. If the former percentage is sufficiently high (low), that would provide empirical evidence that parsimonious theories tend to be true (false), and hence a posteriori justification for the belief that *Parsimony* is true (false).[17]

We respond, first, by noting that even if this test could, in principle, bear on *Parsimony*'s epistemic value, for it to constitute a proper challenge to (C1) requires that we have actually done the test and achieved a positive result—since, for reasons discussed above, we are assuming that we are actually justified in believing that *Parsimony* has epistemic value. The test has not in fact been performed, however—at least not in a way that would suffice to justify *Parsimony*. As such, it has not played a role in *actually* justifying *Parsimony*, and so poses no threat to (C1).

Moreover, as we'll now argue, such a test could not, even in principle, bear on *Parsimony*'s epistemic value. Consider how the objector would describe cases in which, they claim, *Parsimony* is taken to initially support a theory that further evidence later disconfirms. According to the objector, at t_1 *Parsimony* supports theory T over theory T^* given explananda E, and at t_2 we discover additional explananda E', which T^* explains better than T does. Contrary to this description, however, *Parsimony* does not support T over T^* at t_1; for, even at t_1, T^* explains E' better than T does (though we did not know this at t_1), and thus, all else is not equal between T and T^*. A more accurate description of such cases is as follows: at t_1 we mistakenly believe that T and T^* are otherwise equal (because we are unaware of E'), but at t_2 we discover our mistake. Accordingly, rather than the discovery of E' disconfirming a theory initially supported by *Parsimony*, that discovery reveals that we initially applied *Parsimony* too hastily. And similarly, *mutatis mutandis*, for any cases that might be thought to figure in empirically confirming *Parsimony*.

The second objection, also directed at (C1), is that our style of argument for this claim extends not only to other abductive principles, but also to any claim that includes a *ceteris paribus* clause, thus establishing too much—namely, that we cannot have a posteriori justification for believing any such claim.[18]

We respond that our style of argument does not extend to every claim that includes a *ceteris paribus* clause. In many claims involving *ceteris paribus* clauses,

[16] Thanks to a referee for this journal for raising this objection.

[17] Tulodziecki (e.g., 2013) proposes a related method for empirically establishing the epistemic value of various "methodological practices". We see her work as taking important steps toward identifying abductive principles, though not toward justifying them.

[18] Thanks to a second referee for this journal for raising this objection.

the clauses are intended to register that 'other things are equal' in that certain interfering factors are not present. There is, to be sure, a notorious dilemma concerning how to confirm such claims—namely, that if the clause is shorthand for a definite list of factors, then the associated claim will be false (since the list of potentially interfering factors will be indefinitely large); but if the clause is shorthand for an indefinitely large list of factors, then the claim will be either untestable (since any apparently disconfirming case can be taken to fall under its *ceteris paribus* clause) or trivial (if read as indicating that the claim is true unless it isn't).[19] Whether and how this dilemma can be addressed,[20] in any case the considerations blocking the empirical confirmation of *Parsimony* are orthogonal to whether these (other) sorts of *ceteris paribus* claims can be confirmed.

This is because, to start, the *ceteris paribus* clause in *Parsimony* holds other *explanatory considerations* constant, and although we are not in full command of the complete list of explanatory considerations, it is not indefinitely large. Lists of abductive principles are typically short, and even the identification of dozens of additional principles beyond the less than ten that are standardly mentioned would be a far cry from an indefinitely large number. *Parsimony*, then, is not the trivial claim that we should believe whichever theory is most parsimonious unless we should not, but rather, is the substantive claim that we should believe whichever theory is most parsimonious unless competing explanatory considerations cut the other way (where the list of such considerations is not indefinitely large, even if it is presently open to some addition).

It is also worth noting that there is no danger here that, insofar as the *ceteris paribus* clause in *Parsimony* cites a definite rather than indefinite list of factors, *Parsimony* will thereby become empirically testable. This worry arises because it is widely thought that, if the *ceteris paribus* clause in a given claim can be replaced by a definite list of factors, one can test whether the claim holds when the conditions specified in the list are met. But even supposing that such replacement renders some *ceteris paribus* claims testable, it does not render abductive principles testable; for as we emphasized initially, any consideration that would confirm or disconfirm a theory supported by one abductive principle would ensure that some further explanatory consideration was not equal. More broadly, many concerns about *ceteris paribus* clauses in laws miss the mark when directed at *ceteris paribus* clauses in abductive principles.[21]

[19] See the discussion in Lange (1993). Lange attributes this dilemma to Hempel (1988); Earman and Roberts (1999) reject that attribution.

[20] See Reutlinger et al. (2015) for discussion.

[21] For example, Lange (1993) attempts to navigate between the horns of the aforementioned dilemma by holding that for any genuine *ceteris paribus* law, some implicit rule (known to those who understand the law, or which is part of relevant scientific practice) guides justified decisions about whether an apparent failure of the law would count against the law or would rather fall under its *ceteris paribus* clause. On Lange's proposal, even though a genuine *ceteris paribus* clause is not shorthand for a definite list of factors (and thus cannot be replaced by a definite list), it is not entirely unrestricted either. Earman and Roberts reject Lange's proposal, in part, on grounds that it counterintuitively treats scientific laws as inference rules rather than empirical statements; but even if *ceteris paribus* claims cannot usually be treated as inference rules, there is no problem with treating *Parsimony* as such. (Lange further develops his account in, e.g., his 2000, 2009.).

The third objection, again directed at (C1), is that even granting that no empirical evidence could ever bear (in particular) on our belief in *Parsimony*'s epistemic value, our justification for this belief might nonetheless be a posteriori, in depending on a contingent but empirically inaccessible fact. Perhaps some kinds have hidden fundamental metaphysical essences, even though an application of *Parsimony* given all the in-principle empirically accessible facts would deem them non-fundamental. In this case, the objector claims, *Parsimony* would lead us astray, and belief in the epistemic value of *Parsimony* would be a posteriori unjustified, even if we never could be in position to know this.

We have two responses. First, rather than interpret the case as showing that belief in *Parsimony*'s epistemic value is justified a posteriori, in depending on how the world contingently is, one can rather interpret the case as showing that belief in *Parsimony*'s epistemic value, while (as we will moreover argue) justified a priori, is defeasible. As Casullo (2003) argues, there is no experiential indefeasibility condition in the concept of a priori justification; and Summerfield (1991) and Thurow (2006) argue, more strongly, that a priori justification is generally defeasible by experience. Indeed, these defeasibility claims are stronger than our alternative interpretation requires, since by hypothesis the worldly contingencies at issue here are beyond the reach of any experience. Second, supposing that there is some principled non-empirical motivation for thinking that the metaphysical facts at issue are in place, then the proper accommodation of these facts would be part of the *ceteris paribus* conditions under which *Parsimony* would be properly applied, such that the presence of such distinctions could not, even in principle, undermine justified belief in the epistemic value of *Parsimony*. After all, the *ceteris paribus* condition in abductive principles such as *Parsimony* doesn't advert only to the proper accommodation of *empirical* facts, but more generally adverts to any facts that we have reason to believe obtain. And if the metaphysical facts are in-principle inaccessible not just to empirical but to rational investigation, then they can simply be rejected as useless posits.

The fourth and final objection, directed at (C3), is that even granting that no empirical evidence could ever bear (in particular) on our belief in the epistemic value of specific abductive principles, our justification for the more general claim that abduction has epistemic value must rely on a posteriori considerations. For even those who recognize the epistemic value of abductive principles often weight or balance them differently—differences that are plausibly explained by reference to different experiences.

We have two responses. First, even if experience can adjust how abduction is specifically implemented (or which specific implementations are taken to have epistemic value), this in itself does not show that abduction is an a posteriori mode of inference, any more than the fact that experience can adjust what it is possible to conceive (as we know, from teaching our students) shows that conceiving is an a posteriori mode of inference. Relatedly, just as it is typically supposed that idealized conceivers will agree on what is conceivable (even if experience can adjust what it is possible for actual people to conceive), we see no reason to think that idealized abductors would not agree on the proper ranks and weightings of the abductive principles and associated conclusions (even if experience can impact how actual

people implement abduction). Second, as we emphasize below,[22] we see any role that experience plays in how one weights or balances abductive principles as irrelevant to whether the belief that abduction has epistemic value is justified a priori, much as any role that experience plays in concept acquisition is irrelevant to whether a belief that includes that concept is justified a priori.

We thus maintain that whatever role experience does or does not play in adjusting the rankings and weightings of abductive principles, this role does not undermine the claim that our belief in the epistemic value of abduction, understood as a general mode of inference, is not justified a posteriori. Even supposing we are wrong about this, however, it will remain that our beliefs in the epistemic value of the abductive principles that more fundamentally constitute abduction are not justified a posteriori, contra nearly universal assumption; and the results to follow may be processed accordingly (replacing 'abduction' with 'abductive principles').

4 Where it is argued that belief in the epistemic value of abduction is justified a priori

That our belief in the epistemic value of abduction is not justified a posteriori suggests that this belief is rather justified a priori, such that abduction is an a priori mode of inference. Here we aim to provide positive support for the a priority of abduction, by identifying the roles that experience can play in forming a justified belief, and considering the bearing of such roles on whether a given belief is justified a priori or a posteriori. A broader moral of our discussion will be that the roles played by experience in the formation of abductively justified beliefs are relevantly similar to the roles played by experience in the formation of beliefs justified by conceiving.

4.1 Four roles for experience in justification

Consider a claim *p*. There are four ways in which experience might play a role in the course of a particular belief in *p* coming to be justified. Experience might play a role in

(1) acquiring the concepts required to entertain *p*,
(2) acquiring the evidence required to justify belief in *p*,
(3) justifying belief in the epistemic value of the mode of inference used to justify belief in *p*, or
(4) acquiring or learning to deploy the mode of inference used to justify belief in *p*.

Can a belief for which experience plays an ineliminable role along one or more of (1)–(4) be justified ('entirely') a priori? The answer is: it depends on which role is at issue.

[22] See discussion of role (4) in Sect. 4.1.

Re (1): it is commonly maintained that belief in *p* can be justified a priori even if experience is needed to acquire the concepts required to entertain *p*. For example, belief in 'sisters are siblings' can be justified a priori even if we need experience to acquire the concepts or meanings of 'sister' and 'sibling'.[23]

Re (2): it is commonly maintained that belief in *p* cannot be justified a priori if experience is (at all) needed to acquire the evidence supporting *p*. For example, belief in 'water is identical with H_2O' is commonly held to be justified a posteriori, on grounds that justifying this belief requires, in part, acquiring empirical evidence to the effect that water and H_2O are spatiotemporally coextensive; hence it is that the associated modal claim ('necessarily, water is H_2O') is considered an a posteriori necessity.

Re (3): it is commonly maintained that belief in *p* cannot be justified a priori if experience is needed to justify belief in the epistemic value of the mode of inference required to justify belief in *p*. This is the basis for the usual line of thought (to which we responded above) according to which abduction is not an a priori mode of inference.

Re (4): although the role of experience in an agent's acquiring or learning how to deploy a given mode of inference is not much discussed, it seems reasonable to maintain that this role is relevantly similar to that of (1): in each case, experience contributes to belief (or supposition) formation, not to justification. For example, students often need encouragement to think in an appropriately imaginative way about what is possible; but that such imaginative 'training up' is required in order to engage in suitably competent conceiving is not taken to undermine the status of conceiving as an a priori mode of inference. Hence it seems reasonable to maintain that belief in *p* can be justified a priori even if experience is required in order to acquire or learn how to deploy the inferential mode at issue.[24]

[23] The 'can' here and in discussion of the other roles experience might play in justifying a given belief is to be understood as 'can, in the circumstances'. Belief in some claims (e.g., the four-colour theorem) admit of both a priori and a posteriori justification, but our question here is not whether a belief that was justified, e.g., by means of a computer proof, *can* be justified in some different, a priori, fashion, but rather the question of whether, given the specific means by which the belief was justified, the resulting justification is a priori.

[24] One could think of this point as follows: experience playing a significant role in acquiring or learning how to use some mode of inference *M* suggests that *M* is not *innate*, but it does not suggest that belief in the epistemic value of *M* is not justified a priori. Correspondingly, the claim that experience must play an expansive role in our acquiring and learning how to deploy abduction, even if true, would pose no challenge to the claim that belief in the epistemic value of abduction is justified a priori. Plausibly, moreover, abduction *is* largely innate—we think that experience impacts abduction at most by tweaking how we weight and balance abductive principles, and we see this role for experience as relevantly analogous to experience filling in parameters in grammatical structures that are themselves innate, as per the principles and parameters approach to grammar (cf. Chomsky and Lasnik 1993; Chomsky 1995).

Although a mode of inference failing to be innate does not count against its a priority (in the relevant sense), its being innate may support its a priority. Kant (1781/1998) takes the fact that logic is constitutive of right thinking, at least for creatures like us, to provide broadly transcendental grounds for believing in its epistemic value. The innateness of abduction may suggest that it is constitutive of right thinking, no less than principles of logical inference are—indeed, abduction is arguably *prior* to principles of logical inference, insofar as abduction is the ultimate arbiter of disputes about logical principles and their applications. So, if Kant's transcendental argument provides a priori justification for believing that logic has epistemic value, a parallel argument may provide a priori justification for believing that abduction has epistemic value. We find this further argument for the a priority of abduction to be appealing, but leave it for another time.

Now, suppose that a given belief in *p* is justified via abduction. Following the considerations just canvassed, whether that belief is justified a priori turns on whether experience enters into its justification via either role (2) or role (3)—that is, on whether experience provides evidence for *p* without which that belief in *p* would not be justified, or whether experience plays (played) a role in justifying belief in the claim that abduction has epistemic value.

We have seen that experience does not enter into justifying the belief in *p* via role (3): we do not have a posteriori justification for the belief that abduction has epistemic value. Does abductive justification require that experience enter via role (2)? And in cases where experience does enter via role (2) in the abductive justification of a given belief, should the contribution of abduction to this justification be considered a posteriori? As we'll now argue, both questions have negative answers.

4.2 A priori abductive conditionals

Suppose that, as discussed above, abduction can take some empirical evidence as input (e.g., 'water and H_2O are spatiotemporally coincident') and produce a philosophical claim as output (e.g., 'water is identical with H_2O'). Using a strategy familiar from discussions of the underlying a priori basis of a posteriori necessities, we can encode these inferential transitions in conditionals—e.g., 'if water and H_2O are spatiotemporally coincident, then water is identical with H_2O'. Belief in such conditionals can be justified by means of a hypothetical form of abduction, akin to suppositional reasoning in conditional proof, allowing one to identify what *would* be the best explanation of the state of affairs expressed in the antecedent, *were* this state of affairs to obtain (were the antecedent to be true). And since such conditional beliefs may be justified without the antecedent claim's being either believed or true, abduction operates here independently of any claim that is justified through experience (given the previous result re the epistemic value of abduction and abductive principles). Accordingly, such abductively justified conditional beliefs are 'entirely' a priori.

Hawthorne (2002, 252) makes a similar point, suggesting 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; see also Cohen (2010, 152–153) and Wedgewood (2013).

It follows that abduction is an a priori mode of inference, even when it operates on (non-hypothetical) empirical evidence (registering, e.g., the actual spatiotemporal coincidence of water and H_2O). To be sure, when abduction operates on empirical evidence, it does not produce beliefs with (completely) a priori justification, any more than modus ponens does or conceiving is supposed to do. But the contribution of empirical evidence in such cases of abductive inference is simply to discharge the antecedent of a conditional whose justification is entirely a priori. Again, this line of thought is familiar from discussion of the conditional a priori basis of a posteriori philosophical claims. This discussion has usually presupposed that the mode of inference justifying the a priori conditionals is

intuition- or conceiving-based; but the same line of thought supports taking abduction to be an a priori mode of inference, independent of whether its deliverances are (always) a priori.

5 Contrasts with other approaches to abductive or inductive a priority

In this final section, we highlight the main points of contrast between our strategy for establishing the a priority of abduction, and the strategies operative in three other accounts on which certain abductive principles (Swinburne 2001; Peacocke 2004) or certain forms of ampliative inference (Bonjour 1998) are taken to be a priori. Along the way we argue that relevant objections to these other approaches either do not apply to our account or can be resisted.[25]

5.1 Swinburne's and Peacocke's arguments for the a priority of *Simplicity*

Swinburne (2001) and Peacocke (2004) each suppose that the epistemic value of something like an abductive principle of simplicity (henceforth: *Simplicity*) is a priori.[26] One general difference with our approach is that Swinburne and Peacocke each situate their case for *Simplicity's* being a priori against a background supposition of (their preferred accounts of) foundationalism; our argumentation is not so situated, and we take it to be an advantage of our account that it is neutral on this matter, and relatedly, that our results are really quite general.

Our strategies of argumentation also differ. Swinburne takes *Simplicity* to enter (along with certain other criteria) into a priori determinations of probabilities as assigned to propositions, where properly foundational beliefs are propositions that are, to gloss various details, more likely to be true. Why does Swinburne think that the justification for taking *Simplicity* to have epistemic value, so understood, is a priori? Here we cite Everitt (2003), who both summarizes and criticizes the argument:

> Swinburne's argument for saying that simplicity is an a priori determinant of probability is unhappily compressed. He says that our judgements about comparative probability are largely correct, and that this would be the case only if simplicity were a criterion of truth; and further, the principle cannot be established empirically (and hence must be a priori) because any attempted empirical justification will be circular. But the first of these claims is far from evident. It may well be that our judgements of comparative plausibility are correct, and that the favoured theories are *ceteris paribus* simpler than the

[25] Given our topic, a relevant objection is one targeting the status of the epistemic value of the ampliative mode of inference at issue as a priori (as opposed to, e.g., one targeting the epistemic value of the mode of inference).

[26] For purposes of discussion nothing turns on the specific formulation of the principle(s) of simplicity at issue.

> rejected theories. But more needs to be said to show that simplicity is a criterion of truth. (573)

Our argument differs from Swinburne's in two main respects. First, in arguing that principles such as *Simplicity* are a priori, we do not appeal to the claim that any empirical justification would be circular; rather, we appeal, first, to the in-principle unavailability of any empirical evidence that could relevantly bear on (our justified belief in) the epistemic value of such principles (Sect. 3), and second, to the fact that the roles that experience plays in abductive inference do not, by analogy to modes of inference such as conceiving, prevent abduction or associated abductive principles from being a priori (Sect. 4). Second, while we assume that abductive principles have epistemic value, nothing in our discussion implies that this value reflect that such principles are criteria of truth; indeed, we could follow those who are wary of understandings of epistemic value cashed in such seemingly metaphysical terms (see note 15). As such, unlike Swinburne, we do not need to "show that simplicity is a criterion of truth" in order for our weaker claim (that we are justified in taking abductive principles to have epistemic value) to be reasonably accepted. That being said, the claim that abductive principles are criteria of truth is consistent with our position, and our arguments suggest that one who thinks that the epistemic value of abductive principles consists in their being criteria of truth should accept that such principles are a priori.

Our argumentation for the a priority of abduction also differs from Peacocke's, but here we can be somewhat briefer in expressing the most salient difference. Peacocke's case for the a priority of *Simplicity* (his "complexity reduction principle") adverts both to his supposition that "Not all warrants can be empirical, on pain of regress" (31) and to his general notion of 'a priori entitlement', where an entitlement is a priori if it derives entirely from grasping certain concepts, and where grasping a concept involves understanding the constitutive truth conditions of the concept in such a way that it is clear or obvious when applications of the concept satisfy the truth conditions. A number of concerns have been raised against Peacocke's account, but here we'll just flag the general concern raised by Neta (2004), according to which, even granting the apparatus of rational entitlement, it remains unclear why this must be seen as a priori:

> [W]hy should the rationality of our making a particular transition in response to a particular experience depend upon the a priori knowability of the principle that determines which transition we're entitled to make in response to that experience? Suppose I have a visual experience as of a red dot moving horizontally across a green expanse. When I have this visual experience, and I don't have any reason to doubt its veridicality, then I am entitled to make a transition to thinking that there is, before me in space, a red dot moving horizontally across a green expanse. Since I am entitled to make this transition, it is rational for me to make it. Now, when I do epistemology, I come to know all of these facts. But why must we suppose that I come to know them a priori? […] Why couldn't epistemology be an a posteriori discipline? Even if the data to which I appeal are provided by my intuitions, the content of those intuitions might themselves be known only a posteriori, as a result of a

> great deal of experience that I've had. More generally, one might ask: why couldn't all theoretical cognition be a posteriori? Peacocke writes "not all warrants can be empirical, on pain of regress" (31). What regress? If I have an empirical warrant for judging that there is a red dot moving horizontally against a green expanse, why must this empirical warrant rest upon some non-empirical warrant? Why can't all of my warrants derive – either directly (as in the case above) or indirectly (as in the case of highly abstract or theoretical beliefs) – from experience, as Hume suggested? Any contemporary defense of rationalism must answer this question, but I don't see that Peacocke does answer it.

These are nicely pointed questions, but in any case there are differences between our approach and Peacocke's that allow us to either sympathize or engage with Neta's concerns. First, it is no part of our approach that all justification has to ultimately be based in a priori justification; and perhaps more importantly, we reject, for reasons given previously, approaches to a priori or other forms of deliberation that appeal (as Peacocke's does) to what we see as implausible accounts of our possession of concepts and abilities to intuit or otherwise discern their connections. Second, to the extent that we maintain that the epistemic value of abduction and abductive principles to be a priori rather than *a posteriori*, we have provided arguments for this claim, which in turn constitute answers to Neta's core question: why take the epistemic value of these modes of inference to be a priori rather than a posteriori? What he would think of such answers is, of course, beyond our present purview.

5.2 Bonjour's argument for the a priority of induction

Bonjour's (1998) argument for induction's being an a priori mode of inference rests on the claim that we are more likely to inhabit a uniform world than a chaotic world. Induction, he claims, systemically leads to truth in uniform worlds and to falsehood in chaotic worlds; but we cannot know a priori whether our world is uniform or chaotic. How, then, can we justify the belief that induction has epistemic value? His suggestion is that whenever appropriately diverse and extensive experience yields a uniform sample, the fact that such experience yielded a uniform sample demands explanation; and the most likely explanation is that we inhabit a uniform world. This explanation is most likely because the probability of the claim 'we inhabit a uniform world given appropriate experiences of uniformity' exceeds the probability of the claim 'we inhabit a chaotic world given appropriate experiences of uniformity'. The former probability exceeds the latter, in turn, because uniform worlds where someone encounters uniform samples through appropriate experience are more common, in the space of possible worlds, than are chaotic worlds where someone encounters uniform samples through appropriate experience. Working backward: in being a priori justified in believing this explanation of experienced uniformity, we have a priori justification for the belief that we are likely to inhabit a uniform world, and thus have a priori justification for the belief that induction has epistemic value.

One relevant difference between our approach to establishing the a priority of abduction, and Bonjour's approach to establishing the a priority of induction, is that he does, but we do not, require that the world manifest any specific patterns of variation in order for the epistemic value of the mode of inference at issue to be justified. This is relevant, since Bonjour's argument is subject to the immediate objection that he has rather shown that the epistemic value of induction is a posteriori, since based on empirical evidence—namely, on an appropriate experience of uniformity. Our account of the a priority of abduction is not subject to any objection along these lines.

Beyond this concern, the best objections to Bonjour's argument challenge the claim that we are more likely to inhabit a uniform world than a chaotic world (see, e.g., Kornblith 2000; Brueckner 2001; Beebe 2008). No version of this objection bears on our argument for the a priority of abduction, however, since again, our argument does not rest on any claim about what kind of world we are likely to inhabit. Indeed, we deny that any belief about the contingent nature of the world (e.g., that the world is simple rather than complex, or that the world is such that simpler theories are more likely to be true) bears on whether we can justifiably believe that any given abductive principle (e.g., Parsimony) has epistemic value.[27]

We close with perhaps the most relevant similarity between our argumentative strategy and those of previous authors, and an associated objection. Bonjour argues for the conclusion that some mode of inference must be a priori, from the premise that for some mode of inference, the belief that it has epistemic value is actually justified but cannot actually be justified a posteriori. We advanced a not unrelated line of thought at the head of Sect. 3. Poston (2014) objects to Bonjour's argument on grounds that some justified beliefs are justified neither a posteriori nor a priori. Here we present Poston's objection and consider whether it applies to our account.

Poston's objection appeals to a form of epistemic conservatism. Poston holds that beliefs held under "empty symmetrical evidence" are justified simply because they are held, where one has empty symmetrical evidence regarding *P* when one has no evidence for *P*, no evidence against *P*, and no evidence that relevant evidence for *P* can be had (21). Since beliefs held in the face of empty symmetrical evidence are held in the absence of evidence, they are held in the absence of *empirical* evidence, and thus, are not justified a posteriori. Nor are they held a priori, given a positive conception of a priority according to which a belief is justified a priori only if intuiting or conceiving plays an ineliminable role in justifying it. Since neither intuiting nor conceiving plays a role in justifying beliefs that are justified simply because they are held under empty symmetrical evidence, such beliefs are not justified a priori. Given these suppositions, then, beliefs held under empty

[27] Another potential concern for Bonjour's argument for the a priority of induction is that this argument appeals to abduction, but he does not argue for the a priority of abduction and its principles (cf. Brueckner 2001, 7). Bonjour does suggest (in a footnote) that his argument for the a priority of induction might extend to abduction, saying "it is plausible that a justification of empirical theoretical [or abductive] reasoning would be at least approximately parallel to that for induction", 201; but on the other hand, other of his remarks seem to cut against the a priority of abductive principles, as when he asks, "Why, after all, should it be thought … that the world is somehow more likely to be simple than complex?" (91).

symmetrical evidence are justified but are justified neither a posteriori nor a priori. More generally, one cannot infer that a belief is justified a priori just from the premise that it is justified but not justified a posteriori.

Even if Bonjour's argument is subject to this objection, ours is not. Poston's argument presupposes a positive conception of a priori justification, as necessarily involving some form of rational insight; but while Bonjour does accept something along these lines, we do not: on the contrary, we take the concerns raised in Sect. 2 to suggest that conceptions of a priori modes of deliberation as involving intuition, conceiving, or other forms of rational insight, face insuperable difficulties. We rather endorse—as is common—a negative conception of a priori justification, as justification that (modulo whatever experience is needed to understand the propositions at issue, or gain or learn how to deploy the modes of inference at issue) does not rely on experience (empirical evidence), in the relevant senses at issue in our Sect. 4 discussion of what roles experience may play in a priori deliberation. By lights of the negative conception, it is not just that our belief in the epistemic value of abduction is not justified a posteriori (as per the main result of Sect. 3); moreover, this belief is justified a priori (as per the main result of Sect. 4). Moreover, any account of a priori justification that builds in that the only route to a priori justification proceeds by way of some form of rational (intuition- or conceiving-based) insight begs the question against our proposal.[28]

6 Concluding remarks

Philosophers commonly acknowledge that abduction is operative in the justification of philosophical claims going beyond certain forms of evidence, but have nearly universally assumed that the justification for taking abduction to have epistemic value vis-a-vis these and other claims is a posteriori. Here we have argued that a closer look reveals that no empirical evidence could bear on whether our belief in the epistemic value of abduction, or associated abductive principles, is justified. Once this is appreciated, the route is clear to seeing belief in the epistemic value of abduction as justified a priori. We have also aimed to support this result by attention to the roles that experience may play in some claim's being justified; here we have argued that experience plays no role in abductive inference that prevents abduction from being a priori. In particular, belief in conditionals having as antecedent the relevant empirical facts (e.g., 'water and H_2O are spatiotemporally coincident') and as consequent an abductively supported claim (e.g., 'water is identical with H_2O') can be justified 'entirely' a priori. Abduction is, after all, an a priori mode of inference.

[28] It may moreover be worth noting that epistemic conservativism is unpopular: even Poston acknowledges that "the one thing in epistemology that everyone agrees about [is that] conservativism makes for bad epistemology" (20). That said, we do not see Poston's conservativism as inconsistent with our position. Rather, what we reject is a position combining his conservativism with a particular positive conception of a priority.

This is good news for philosophers, for abduction has clear advantages over other modes of a priori inference, involving intuition and conceiving, that have been traditionally appealed to as justifying philosophical claims that, one way or another, transcend the empirical. In particular, abduction is a distinctively *rich* mode of inference, with ampliative, fine-grained resources enabling it to bridge conceptual gaps and substantively legislate between competing philosophical views. Abduction is not just useful for scientific or everyday inference; on the contrary, it is the ultimate philosophical tool—and one that, we have here aimed to establish, can be largely employed from the armchair.

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