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The epistemological objection to modal primitivism

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Abstract
Modal primitivists hold that some modal truths are primitively true. They thus seem to face a special epistemological problem: how can primitive modal truths be known? The epistemological objection has not been adequately developed in the literature. I undertake to develop the objection, and then to argue that the best formulation of the epistemological objection targets all realists about modality, rather than the primitivist alone. Furthermore, the moves available to reductionists in response to the objection are also available to primitivists. I conclude by suggesting that extant theories of the epistemology of modality are not sensitive to the question of primitivism versus reductionism.

Keywords Modal primitivism · Modal realism · Epistemology · Reliabilism

1 Introduction

There are two broad alternatives when it comes to the explanatory status of modal truths: reductionism and primitivism. The modal reductionist thinks that modal truths may be reduced to, or explained by, purely non-modal features of reality. One such view is modal realism about possible worlds, as defended by David Lewis. The modal realist's possible worlds are concrete universes that differ from our universe in infinitely many ways. Intuitively, there is a possible world for every way that the world could have been. Possible worlds explain possibility claims via this reduction: possibly *p* iff there is a possible world in which *p*. This is the sense in which modal realism is reductionist—the truth of a modal claim ultimately turns on the non-modal features

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of concrete worlds.[1] The modal realist's ontology may be difficult to accept, but it has certain theoretical advantages. Possible worlds have figured widely in many different areas of philosophy, including analyses of counterfactuals, propositions, properties, knowledge, and other notions of philosophical interest. Furthermore, modal realism promises to provide a possible worlds semantics for modal discourse.[2]

The reductionist's opponent is the modal primitivist, who invokes a primitive modal notion in their ideology. Primitivists accept some primitive modal notion or other that reductionists reject, such as *consistency*, *incompatibility*, *dispositionality*, or simply *possibility*. As such, all else being equal, primitivist theories are thought to be theoretically less virtuous than reductionist theories. But there is sometimes a trade-off between ontology and ideology—for one thing, modal realism is relatively unparsimonious when it comes to ontology.[3] And the main reductionist competitor to modal realism, combinatorialism, is arguably less ideologically simple upon examination. (This view will be discussed further in Sect. 3.)

Nonetheless, many take a commitment to primitive modality as a serious disadvantage of a theory.[4] But what exactly is the worry? One objection to primitivism stems from epistemological worries. Sider writes (2003: p. 5):

Why seek [a reduction]? One traditional motivation lies in modality's connection to epistemology. Many modal claims are known a priori, and it is a puzzle how this is possible, how we manage to know modal claims without the benefit of sensory experience. The epistemology of the modal can be secured if modal notions are defined in terms of notions whose epistemology is secure.

And MacBride writes (1999: p. 473):

The modal reductions to be considered are motivated by epistemological and explanatory concerns. Suppose there is a range of irreducibly modal entities: individuals that are merely possible; properties such as *being necessary* and *being contingent*. Merely possible individuals do not figure in causal relations. It is therefore difficult to understand how we could ever have reason to believe in their existence. It is similarly mysterious how it could be determined that a state of affairs had the property of being necessary rather than being contingent. How could a necessary state of affairs affect the mind differently from a merely contingent state of affairs?

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[1] The term "possible world" is misleading—it's not that some worlds are possible, and some are not possible. These worlds are simply "out there". Lewis invokes possible worlds throughout his work, but the main source for his metaphysical views on possible worlds comes from Lewis (1986). Modal realism is not the only version of realism about possible worlds or modality, nor is it the only reductionist view. It would be better if it were called something like "concretism" about possible worlds (see Menzel 2017); however, since "modal realism" is the name by which this view is widely recognized and discussed in the literature, I will stick with the term. Defenders of versions of modal realism include Bricker (1996, 2001), Divers (2002) and McDaniel (2004).

[2] See Bueno and Shalkowski (2015), however, for an argument against theoretical utility as a truth-indicative feature of modal theories.

[3] For the original formulation of the distinction, see Quine (1951).

[4] See for instance Lewis's (1986: pp. 150–157) objections to versions of ersatzism about possible worlds.

The main epistemological challenge for the primitivist thus seems to stem from lack of causal access.[5] However, this objection—an analogue of the Benacerraf problem in mathematics—has not been developed further in the literature. There is, of course, a literature on the epistemology of modality generally and on what Peacocke (1997, 1999) calls the "integration challenge"—which in the case of modality, is the question of how to reconcile a metaphysics of modality with its epistemology. But the claim that the epistemological objection poses a unique threat to the primitivist has not been adequately assessed. I undertake to develop and assess the objection. Section 2 is an examination of how the epistemological objection bears on varieties of primitivism. I argue that the best formulation of the epistemological objection targets all realist theories of modality. In Sect. 3, I show how the epistemological objection applies to each of the main reductionist theories. I end in Sect. 4 by addressing the (ir)relevance of extant theories of the epistemology of modality to this topic.

Before moving on, note that there are other approaches to modality that may be considered antirealist (or deflationary). Antirealists locate the source of modality—if there is any such thing—not in the mind-independent universe, but in our conceptual architecture or language practices.[6] I will only be focusing on realist theories of modality, those on which modal truths are mind-independent. My conclusion in this paper is thus of limited scope; it may turn out that because of epistemological considerations, we ought to turn to antirealist theories of modality over realist theories. But the main task here is much more modest.

2 The epistemological objection

Setting skepticism to one side, it is clear that we can acquire knowledge of the world around us through sense perception. For instance, I can know that there is a cat in the box in front of me by seeing him. Perceiving something involves being causally affected by it; this is what distinguishes genuine perception from, e.g., hallucination. Many thus agree that there is a causal condition on perceptual knowledge.[7] It is equally clear that we can acquire knowledge of unperceived things by way of their interactions with things that are perceived. I have never seen the mouse that lives in my kitchen, but I have seen the crumbs that he leaves behind. By observing the rapid movements of pollen grains in water under a microscope ("Brownian motion"), scientists were able to infer the existence of atoms and molecules. It is much less clear how we can achieve knowledge of things that are not causally related to us.

In "Mathematical Truth", Benacerraf argued against knowledge of mathematical objects such as numbers by assuming a causal condition on knowledge generally rather than merely on knowledge through perception. This has come to be known as the Benacerraf problem, and discussions of it or related problems have continued

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[5] Note that this not Lewis's own main objection to primitivism.

[6] See for instance Cameron (2010), Sidelle (1989), Sider (2012), and Thomasson (2007, 2013).

[7] For a canonical statement of this view, see Grice (1961).

to figure prominently in the philosophy of mathematics.[8] Analogous problems have been formulated for other *prima facie* causally inert entities such as universals or (on some views) moral features of the world.[9] Call these different versions of "the epistemological objection". In the case of modality, the epistemological objection is that we don't seem to be able to perceive, or otherwise causally interact with, modal features of the world, at least construed as *sui generis* features. If this is right, then we cannot have modal knowledge.[10]

While the epistemological objection make sense in the context of knowledge of *prima facie* causally inert objects, such as numbers, it is less straightforward to apply in the case of modality. This is because not all primitivists about modality accept the existence of modal *entities* in their ontology in addition to their primitive modal ideology.[11] In order to make sense of the epistemological objection in this context, it is necessary to examine specific primitivist theories.

Recent decades have seen the development of different varieties of primitivism, united only by acceptance of primitive ideology that is modal in character. Most notable is modalism, the view that some truths about what's necessary or possible are primitively true.[12] Such modal sentences are given homophonic truth conditions in which possibility and necessity operators figure: "There could have been a talking donkey" is true iff there could have been a talking donkey. At least one of the modal operators "necessarily" and "possibly" is taken as an ideological primitive. Acceptance of a primitive notion does not require thinking that the primitive corresponds to some entity in one's ontology. The modalist may say that if some proposition or sentence *P* is possible, this means that the world is such that possibly *P*, and that the world's being this way is not subject to further analysis or explanation.

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[8] See Clarke-Doane (2017), Liggins (2010) and Linnebo (2006) for discussions of the Benacerraf problem in the mathematical case; see also Benacerraf (1973) for the original formulation.

[9] See Clarke-Doane (2017: pp. 17–18) for examples.

[10] Strohminger (2015) argues that we can have perceptual knowledge of modal truths, so on her view, some cases of modal knowledge meet the causal condition. But her view is the exception; most deny that we can have perceptual knowledge of modal truths.

[11] Let a modal entity be an entity of any ontological category whose existence, instantiation, etc. has implications for modal space.

[12] Modalism is defended in deRosset (2014), Forbes (1989, 1992), Peacocke (1978, 2002), and the Postcript to Prior and Fine (1977). It is also defended in the service of an account of logical consequence in Bueno and Shalkowski (2009, 2013, 2015). If we allow modalism to also encompass views on which maximal states of affairs or world properties are primitively possible, then we may also include Adams (1974, 1981), Plantinga (1974, 1976), and Stalnaker (1976, 2012).

Other versions of primitivism typically accept property talk, thus locating primitive modality at a "lower" level. The incompatibilist posits primitive incompatibilities between certain properties, so that what's possible or not comes down to whether or not the properties involved are compatible.[13] The dispositionalist accepts primitive dispositions of objects such as fragility or negative charge, which underlie all modal features of the world.[14] And the essentialist holds that modal claims expressible using the modal operators are reducible to claims about essence.[15]

In the case of mathematics, the epistemological objection concerns our lack of causal interaction with mathematical objects like numbers. But there is no direct analogue in any of the primitivist views. The modalist typically accepts only modal ideology rather than ontology. And while defenders of the other three views often accept modal entities in the form of modal properties, they could do without. For instance, the incompatibilist may think that some properties are primitively (and necessarily) incompatible without reifying incompatibility, that is, accepting the existence of an incompatibility relation. Hence, the objection must be clarified in some way if it is to apply to all versions of primitivism.[16]

We can again look to the mathematical case for guidance. It is now widely thought that Benacerraf's assumption of a causal condition on knowledge should be rejected. Field's (1988) formulation of the epistemological objection is recognized as an improvement. Field calls on the mathematical realist to explain the correlation between mathematical sentences believed by mathematicians to be true, and the mathematical truths. That is, what explains the reliability of mathematicians' beliefs about the mathematical truths? We can explain why our ordinary beliefs about the world are reliable via a causal explanation of the reliability of perception. But no such causal explanation seems to be available when it comes to mathematical objects. So if the mathematical realist insists that mathematicians' mathematical beliefs are reliable, they must supply an explanation.

In the modal case, we could likewise challenge the primitivist to explain why the modal claims she thinks are true really express true propositions, even if they do not accept any modal *entities*. Suppose, for instance, that different masses are primitively incompatible. This truth does not seem to be the kind of truth that is a cause or

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[13] See Jubien (2009), Lycan (1988) and Wang (2013).

[14] The following works include defenses (or at least suggestions) of dispositionalism: Borghini and Williams (2008), Contessa (2010), Ellis (2001), Jacobs (2010, 2011), Molnar (2003), Mumford (2004), Pruss (2002, 2011), and Vetter (2015).

[15] Primitivists about essence include Fine (1994, 1995), Lowe (1998, 2008a, b), and Mallozzi (Forthcoming). Note that the primitivist status of essentialism is controversial. McLeod (2001) appears to accept a modal primitivist theory that invokes essence, but Bueno and Shalkowski (2009, 2013) claim to remain neutral on which is the prior notion, essence or necessity.

[16] Defenders of dispositionalism do typically endorse modal entities—namely, the dispositional properties underlying the dispositions of objects. But the dispositionalist's views on the nature of such properties also furnishes them with a reply to the epistemological objection. *Dispositionality* is a causal notion. If an object x has the disposition towards some manifestation M, then x has the causal potential to interact in certain ways with other objects, as specified in M. The dispositionalist's response to the epistemological objection is that their modal entities are not causally inert; they are in fact individuated by their causes and effects.

effect—that is, figures in causal relations.[17] So this version of the epistemological objection does seem to be a problem for the primitivist.

On the other hand, it is a problem for all realists about modality, not just some subset of realists. Clarke-Doane writes in the mathematical case (2017: p. 21):

> [Field's challenge] does not obviously depend on the view *that mathematics has a peculiar ontology*. *Prima facie*, his challenge merely depends on the view that mathematical truths are causally, counterfactually, and constitutively independent of human minds and languages. The converging opinion that there is no epistemological gain to "trading" ontology for ideology in the philosophy of mathematics reflects this point. But the point is often misconstrued. The point is not that the explication of the ideological "primitives" will still somehow make reference to abstract objects, so the apparent loss of ontology is illusory. The point is that abstract objects are not what give rise to [Field's challenge] in the first place.

But if this is right, then the corresponding epistemological objection for the primitivist does not target the primitivist uniquely; it is directed at all realist views of modality, including reductionism. Whether or not the reductionist can meet the objection requires examination. The next section expands on how the epistemological objection applies to reductionist theories, which has been explored in the case of modal realism, but not its main reductionist competitor, combinatorialism.

3 Reductionist epistemology

The reductionist promises to escape the epistemological objection by reducing modal features of the world to non-modal features whose epistemology is secure. But it is by no means clear that they succeed. There are two main reductionist theories to consider: modal realism and combinatorialism. The epistemological objection is not discussed in relation to the latter. But there is an exchange between Lewis and his critics about the epistemology of modal realism, that may help shed light on both.

Modal realism reduces modal facts to facts about a pluriverse of concrete worlds. But other possible worlds are spatiotemporally distinct from and causally inaccessible to our own. Hence, it seems that modal realism is subject to both the original Benacerraf problem and Field's challenge. Richards (1975) makes this point by turning one of Lewis's objections to his opponents into an objection to modal realism. In *Counterfactuals*, Lewis argues that possibility cannot be reduced to logical consistency, for although there are models of first-order logic that assign overlapping extensions to 'pig' and 'sheep', pigs cannot be sheep. Richards (1975: p. 112) replies:

> [The modal realist must] show why he is so sure that there is no possible world in which some pigs are sheep. If this objection does indeed show a lack of match between satisfaction conditions and possible worlds, then whence comes his knowledge of that lack of match? The inscrutability of other worlds, as well as

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[17] There is, of course, disagreement about the proper relata of causal relations—this claim may require reformulation.

their infinite number, rules out any suggestion of our looking for one which has sheepy pigs, and at the end of the search finding none.[18]

This objection is related to Kripke's (1972: p. 44) point that possible worlds are stipulated, not discovered or observed. Our epistemic access to other possibilities must be prior to our knowledge of other possible worlds—otherwise we could not distinguish between worlds that were possible and those that were not in the first place.

Lewis responds to the epistemological objection by rejecting the causal theory of knowledge, as he does in the case of mathematics.[19] He also addresses the worry that whereas mathematical entities are abstract, his possible worlds are concrete—and truths about the former, but not the latter, can be known without causal acquaintance. Here, Lewis's response is to say that only knowledge of contingent truths requires causal acquaintance. Knowledge of necessary truths—including those of mathematics and modality—do not.[20]

To fully address Field's challenge, Lewis must explain how we come to have modal knowledge. He writes (1986: pp. 113–114):

I think our everyday modal opinions are, in large measure, consequences of a principle of recombination … One could imagine reasoning rigorously from a precise formulation of it, but in fact our reasoning is more likely to take the form of imaginative experiments. We try to think how duplicates of things already accepted as possible—for instance, because they are actual—might be arranged to fit the description of an alleged possibility.

Lewis's statement of the principle of recombination (in an earlier section) uses the language of modal realism: for any part *x* of possible world *w*, and any part *y* of possible world *v*, there exists a possible world that contains a duplicate of *x* and a duplicate of *y*. But it need not be formulated in exactly this way, and in fact, Lewis himself suggests that the formulation could do with improvement.[21] Arguably, there is some adequate formulation of this principle that the primitivist could accept as well, depending on the primitivism in question. For instance, a primitivist who accepts a class of primitive necessities may take states of affairs that respect those necessities to be possible. This part of Lewis's response is thus not only available to the modal realist.

Lewis continues (1986: p. 114):

For more far-fetched possibilities, recombination is less useful. But there are other principles that we can apply. A rejection of arbitrary-seeming limits on the plenitude of worlds, for instance, might lead us to conclude that if any worlds

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[18] Lycan (1979: pp. 294–295) agrees with Richards.

[19] See Lewis (1986: p. 109).

[20] See Lewis (1986: pp. 110–112). It is worth noting that in this passage, Lewis seems to assume that it is *sensitivity* which is at issue in the Benacerraf problem. For discussion of how this might be problematic, see section 2.4 of Clarke-Doane (2017). Further discussion of how Lewis's view fares with the epistemological objection appears in Stalnaker (1996).

[21] For discussions of formulations of the principle of recombination, see Bricker (1996, 2001), Divers and Melia (2002), Efird and Stoneham (2008), and Nolan (1996).

have seventeen dimensions then others have eighteen; or that it is highly unlikely that every natural property instantiated at any world is instantiated here at our world.

Again, this is a methodological principle that the primitivist may also adopt. But Lewis then continues (1986: p. 114):

On still other questions, there seems to be no way at all of fixing our modal opinions, and we just have to confess our irremedial ignorance. I think one question of this kind concerns incompatibility of natural properties. Is it absolutely impossible for one particle to be both positively and negatively charged? Or are the two properties exclusive only under the contingent laws of nature that actually obtain? I do not see how we can make up our minds; or what guarantee we have that there must be some way to settle the question. Certainly we are not entitled just to make the truth be one way or the other by declaration. Whatever the truth may be, it isn't up to us.

While I agree that the truth is typically not up to us, I think the primitivist may protest here. Consider the primitivist who accepts primitive incompatibilities. Incompatibilities arise only in certain cases, for instance, when they are two determinates of the same determinable. Lewis does not tell us how to distinguish sufficiently general methodological principles from insufficiently general ones; but the incompatibilist's principle does not seem to be ad hoc. All things considered, it seems that if Lewis's response to Field's challenge works for his own view, then it works for primitivism as well, for his response does not seem to rely on the distinction between reductionism and primitivism.[22]

It might seem natural to extend Lewis's response to Field's challenge to modal realism's main reductionist competitor, combinatorialism, as defended by Armstrong (1989, 1997). A combinatorialist theory of modality is one on which what's possible is reducible to combinations of actually existing atomic elements, where what these elements are varies by theory. These combinations yield some of the facts about other possibilities; all other facts supervene. On the version defended by Cresswell (1972) and Quine (1968), the atomic elements are points of spacetime, which may either be occupied by matter or unoccupied. Any combination of points of spacetime with their occupied or unoccupied states is a possibility. Armstrong (1989, 1997) defends a version of combinatorialism on which the possibilities are combinations of particulars with universals.[23]

I have argued (Wang 2013) that combinatorialism requires primitive notions, albeit non-modal, that the primitivist does not need. In fact, it turns out that the combinatorialist requires *two* primitive notions the modal primitivist does not need. First, the combinatorialist must restrict her principle so that determinates of the same determinable cannot be co-instantiated, and thus requires the notion of *co-determinacy*—that is, the notion of being determinates of the same determinable.

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[22] Bueno and Shalkowski (2015) and Peacocke (1997, 1999) have separately defended primitivist epistemologies that seem equally available to the reductionist. So Lewis's story is not the only one available.

[23] Versions of combinatorialist principles also appear in Eddon (2007), Maudlin (2007), Saucedo (2011), Schaffer (2003, 2010), and Sider (2005).

Second, she must restrict her principle so that spatiotemporal relations obey primitive metric constraints like the triangle inequality, and thus requires some appropriate spatiotemporal notion or other, like *distance*.

If this is right, then the epistemological objection applies to combinatorialism as well, albeit in a slightly different way. In accepting these ideological primitives, the combinatorialist need not countenance primitive entities, much as the modal primitivist need not accept primitive modal entities. But both equally face Field's challenge. The fact that two properties are co-determinates does not seem to play a role in causal chains, just as the fact that two properties are incompatible does not seem to play a role in causal chains. The combinatorialist must explain how her beliefs about primitive co-determinacy facts, or primitive distance facts, are reliable.

May the combinatorialist adopt Lewis's response to Field's challenge? There seems to be a disanalogy between the cases. Lewis's principle of recombination is unrestricted; it does not require consideration of the natures of the entities being recombined, beyond their being parts of possible worlds. This is because what's being recombined are concrete parts of worlds, which are possible alone or together. But the combinatorialist's principle of recombination must be restricted—for her, what's being recombined are properties, and as argued above, these cannot be freely recombined. This suggests that modal realism has an epistemological leg up over both its reductionist competitor and primitivism.

However, I don't think the story is so simple. It's true that Lewis's principle of recombination is unrestricted; but it is not at all clear that it is the principle in play in his response to Field's challenge. After all, he motivates his response by appealing to "imaginative experiments" and "duplicates of things already accepted as possible, for instance, because they are actual". This does not sound like an appeal to our knowledge of parts of other possible worlds—such knowledge is precisely the phenomenon he is seeking to explain. He must be appealing to principles of recombination that look more like the combinatorialist or primitivist's principle.

4 The epistemology of modality

I have argued that primitivists and reductionists alike face the epistemological objection. I have also argued that they may give the same sort of story in response to Field's challenge. I would like to end by suggesting that the debate between primitivism and reductionism is irrelevant to extant theories of the epistemology of modality.

Consider conceivability accounts of modal knowledge. Conceivability accounts trade on a connection between conceivability and possibility. For some, the connection is direct: if P is conceivable (or conceivable in a certain way), then P is possible, perhaps because there are analytic or constitutive relations between conceivability and possibility.[24] For others, the connection is only one of reliable indication.[25] Either way, conceivability is a means for acquiring reliable modal beliefs. There has followed

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[24] See for instance Chalmers (2002). Note that a view on which there are analytic or constitutive relations between conceivability and possibility is unavailable to the realist about modality.

[25] A prominent defender of this position is Yablo (1993).

a substantive literature on what it means for a state of affairs to be conceivable. For our purposes, it is enough to note that no one distinguishes between the conceivability of a primitively possible state of affairs, and a possible state of affairs whose possibility is reducible. The question of conceivability just does not seem to be sensitive to the question of primitivism versus reductionism. Field's challenge is a request for an explanation of the reliability of our modal beliefs. Whether a conceivability account can offer such an explanation depends upon the details of the account; the account must explain *why* conceivability is reliable.

There are other theories of the epistemology of modality, such as counterfactual or essentialist accounts. But I believe the moral generalizes: defenders of these views must explain why their own means of gaining modal beliefs is reliable, and this again does not seem sensitive to the debate between reductionism and primitivism. In sum, if Field's challenge can be met by the reductionist via some extant epistemology of modality, it can be met by the primitivist in the same way.

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