You Really Do Imagine It: Against Error Theories of Imagination

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Before Kripke and Putnam, most philosophers accepted that *a posteriori* identities were contingent; it was, after all, very easy to imagine the falsity of any *a posteriori* identity. It seems fair to say that Kripke (1971, 1980) revolutionized how we understand the relationship between epistemology and modality. He argued persuasively for the necessity of identity and hence that identities discovered *a posteriori*, like water $=$ H_2O, turn out to be necessary, not contingent. This is now the received wisdom. Let us assume that philosophers were convinced to accept a correct conclusion: there are *a posteriori* necessities of the kind that Kripke and Putnam cite.

In the course of arguing for his views Kripke also claimed that we *cannot imagine* the falsity of these *a posteriori* necessities. That's a very different sort of claim, a claim about imagination, not about the relationship between epistemology and modality. It's one thing to hold that identity A$=$B is necessary; it's another matter altogether to hold that we cannot imagine that A$\neq$B. But Kripke does take a stand on imagination, answering "no" to the following question:

(Q1)   Can we imagine situations that are, in fact, impossible?

In elaborating the Kripkean view, Yablo (1990, 1993, 2006) offers a slightly different proposal. He thinks that pre-Kripke many people could imagine water $\neq$ H_2O, but post-Kripke the situation is importantly different. The crucial question for Yablo is this one:

(Q2)   Can we imagine situations that we antecedently believe to be impossible?

So while Yablo concedes the answer to the first question may be "yes," he answers "no" to the second.

In this paper I argue that Kripke and Yablo are both mistaken about imagination. The answer to both questions is "yes": it is easy to imagine impossible situations, including situations deemed impossible only *a posteriori*, even after we acknowledge that they are impossible. I first establish that Kripke in fact answers "no" to the first question (§1). I'll then explain why I think that's a mistake, why it is plausible that we can imagine the impossible (§2). That discussion will make is clear that Yablo's extensions to Kripke's views about imagination also don't stand up to scrutiny (§3).[1]

At this point I'll have shown that Kripke and Yablo hold implausible views about imagination. One might think we nevertheless must accept this implausible view because it offers the best hope for retaining imagining as a guide to metaphysical possibility in the face of *a posteriori* necessities. If we routinely imagine the impossible, how can we continue to take imagining to provide evidence for metaphysical possibility? I'll sketch a positive proposal that shows how (§4); though we can imagine the impossible, my proposal supplies independent

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[1] I present Kripke as taking a firm negative stance on (Q1), but that is stronger than I need. My principle aim is to demonstrate that the answer to both (Q1) and (Q2) is "yes."

grounds (i.e., grounds other than the very modal conclusions at issue) for denying that imagined impossibilities are evidence for possibility.

I close by showing how my analysis allows a tidy resolution to Kripke's influential discussion of the zombie argument for dualism at the end of *Naming and Necessity* (§5).

1   Kripkean Error Theory

The view I attribute to Kripke is an *error theory* about imagining. The picture I take Kripke to have in mind goes something like this. Perception tells us about actuality, and we perceive only what it true (understand 'perceive', 'see', 'hear', and so on as success verbs). Similarly imagination tells us about metaphysical possibility, and we imagine only what is possible.[2] Think of imagination as a telescope through which we survey genuine possibilities — call this the *telescopic* view of imagining.[3] On the telescopic view of course you cannot imagine the impossible.

Kripke realizes that, given his conclusions about the necessity of some *a posteriori* truths, it's going to *seem* like we can imagine impossible situations. The telescope initially seems to reveal impossible situations. He accepts that he needs to explain away these apparent imagined impossibilities. Kripke's familiar strategy *reconstrues* these cases: we do not *really* imagine something impossible, rather we imagine a possible situation that is similar enough to the impossibility to be mistaken for it. This is an error theory about imagination; Kripke's version of it consists of at least three claims:

Error Theory

When we seem to and take ourselves to imagine a situation S that falsifies some *a posteriori* necessity N,

(Unimagined)   We *do not* in fact imagine S.[4]

(Confusion)   We imagine a situation S′ that we confuse for S.

(Possible)   Situation S′ is possible and consistent with N.

Kripke's Error Theory explains why he thinks we needn't answer (Q1) affirmatively. We mistake what we see in the telescope: the situation we imagine is a genuine possibility, we're just a little confused about what situation it is. We make mistakes about what we imagine. In this section I want to establish that Kripke endorses the Error Theory.

Most philosophers have so internalized the Kripkean story about *a posteriori* necessities that it is difficult to recall the heady days when we encountered his ideas for the first time. Let us try to remember what that was like. Take Eddie as one of the uninitiated; Eddie has not given a lot of thought to scientific identities, composition, and origins, but if pressed, he would be inclined to say that they are contingent. What happens when Eddie attempts to imagine water composed of XYZ, Twain punching Clemens, or this wood table not composed of molecules? In the table case, Kripke suggests that Eddie is not imagining the

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[2] Henceforth I'll drop the qualification "metaphysical"—'possible' by itself will always mean metaphysically possible.

[3] I find it ironic that Kripke explicitly dismisses the telescope metaphor in objecting to Lewis (1986), since by my lights he must have something like the telescopic view in mind.

[4] Kripke often says something stronger, that we *cannot* imagine S. See discussion below.

impossible after all.

> But whatever we imagine counterfactually having happened to [the table] other than what actually did, one thing we *cannot imagine* happening to this thing is that it, given that it is composed of molecules, should still have existed and not have been composed of molecules. We can imagine having discovered that it wasn't composed of molecules. But once we know that this is a thing composed of molecules — that this is the very nature of the substance of which it is made — *we can't then*, at least if the way I see it is correct, *imagine* that this thing might have failed to have been composed of molecules. (Kripke 1980, pp. 126–27, emphasis mine)[5]

Here Kripke clearly endorses Unimagined. Eddie does not (because he *cannot*) imagine this very table composed of an ethereal entelechy because its "very nature" is to be composed of molecules. Perhaps before he realized the table was made of molecules he might have thought he could imagine it composed of an ethereal entelechy. But especially now that he realizes that the table is made of molecules, he realizes he wasn't imagining, because he can't imagine, that it is not.

(The reader might wonder: does Kripke have to answer "no" to (Q1)? Perhaps in the past we could imagine the impossible, but only because we didn't realize it was impossible. That's why Kripke includes provisos like "given that it is composed of molecules." Once we realize a situation is impossible we can no longer imagine it; though the answer to (Q1) is "yes," the answer to (Q2) is "no." If that's the way you read Kripke, then you take Kripke to share Yablo's view. I argue that view is also mistaken, but we'll discuss that view in section three.)

Because something like the telescopic view motivates Kripke, he thinks that what we imagine is a genuine possibility, modulo some plausible reconstrual via the Error Theory. Hence he raises a challenge for anyone who asserts that some apparently imagined situation is impossible: to show that there is no evidence that is a situation is possible, you must show that we cannot imagine the situation after all. That's the essence of his challenge to materialists.

> [The materialist] has to hold that we are under some illusion in thinking that we can imagine that there could have been pains without brain states… He has to show that these things we think we can see to be possible are in fact not possible. *He has to show that these things we can [seem to] imagine are not in fact things we can imagine.* (1971, p. 163, emphasis mine).

This is another clear endorsement of the Error Theory.

Although Kripke endorses the Error Theory, in several passages imagination and error theory play a less prominent role.[6] The reason is that Kripke works with two interwoven threads. Kripke's primary concern is to argue for the existence of *a posteriori* necessities.

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[5] Kripke is also quite explicit in (1971): " 'Heat is the motion of molecules' will be necessary, not contingent, and one only has the *illusion* of contingency in the way one could have the illusion of contingency in thinking that this table might have been made of ice. We might think one could imagine it, but if we try, we can see on reflection that *what we are really imagining* is just there being another lectern in this very position here which was in fact made of ice" (pp. 160–61, emphasis mine). See also (p. 153).

[6] See e.g. his analysis of Hesperus and Phosphorus (1980, pp. 102–03) and (1971, pp. 155–56), of gold (p. 125), of Cicero and Tully (1971, pp. 156–58), and of fool's water (1980, p. 128).

Should we say that it is possible for gold to have ten fewer protons, that possibly Hesperus ≠ Phosphorus, or that this table could have been made of ice? No, Kripke argues. The second thread is our focus: what we can and cannot imagine. Kripke shifts between these two threads, not overly concerned to distinguish them, because his primary concern is the first thread, with what is possible.

When we attend to the second thread, however, it is plain that Kripke feels it's his burden to say something about our apparent ability imagine gold with ten fewer protons, Hesperus not identical to Phosphorus, and this table made of ice. He responds with the Error Theory.

Confusion about Kripke's notion of *epistemic possibility* sometimes obscures the fact that he endorses the Error Theory. A proposition is epistemically possible if we are unable to rule it out relative to some epistemic standard: the proposition is true for all we are justified in believing, or for all we know, or for all we know for certain. An alternative interpretation claims that Kripke doesn't endorse the Error Theory: we aren't mistaken about what we imagine because we really do imagine epistemic possibilities.[7] That's why Kripke concedes, "We can imagine having discovered that [this wooden table] wasn't composed of molecules," because we really imagine the epistemic possibility.[8] No error theory applies. Our problem is we mistake genuine (metaphysical) possibility for mere epistemic possibility, but it is quite understandable if ordinary folk (not to mention pre-Kripkean philosophers) fail to appreciate that kind of technical philosophical distinction.

I doubt whether this alternative interpretation is what Kripke intends, and, regardless, it fails to avoid the Error Theory. The point of epistemic possibility is to make Confusion (the second claim of the Error Theory) plausible, not to avoid the Error Theory.

Kripke explains epistemic possibility as imagining "…appropriate qualitatively identical evidential situations [in which] an appropriate corresponding qualitative statement might have been [true]" (p. 142).[9] Kripke's externalism about meaning entails that in a different situation the corresponding qualitative statement "Water is not composed of H_2O" would mean something different than the English sentence 'Water is not composed of H_2O.' Hence when we imagine an epistemic situation qualitatively identical to our own, we imagine a situation in which an utterance of 'Water is not composed of H_2O' is true. The word 'water' means something other than what it actually does. In that situation there is no water around though there is stuff that is called 'water' by us. When Kripke writes that we can imagine

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[7] E.g., Soames (2007, pp. 291–92). Though Soames contends we genuinely conceive epistemic possibilities, I don't claim that Soames endorses the alternative interpretation I discuss in the text. He seems to have in mind something more like Yablo's view, according to which once we find out relevant actual world facts we can no longer imagine certain impossible situations. Chalmers (1996, p. 60 & 2002, §3) employs the notion of *considering a situation as actual*, which as I read him, means that we can imagine epistemic possibilities, we just imagine them "as actual" rather than "as counterfactual."

[8] Kripke repeatedly asserts that we can "imagine discovering" that some *a posteriori* impossibility: we can imagine "discovering" that the Queen was the Trumans' daughter (1980, pp. 111 & 112) and "having discovered" that heat was not molecular motion (1980, p. 131); we can "conceivably discover" that this wooden table is made of ice (1980, p. 113); and we "could find out" that gold's atomic number was not 79 (1980, p. 123).

[9] There are recognized problems with this metalinguistic turn that don't bear on the point I make here. See Bealer (1994) and Soames (2007).

"having discovered" or "finding out" that water is not H_2O, he is speaking loosely; we cannot *really* imagine it turning out that water is not H_2O.[10]

This is still the Error Theory. Let me describe the error in a way that hints at why I think the view is implausible. You believe that water is H_2O, and probably also that water is necessarily H_2O. However, you acknowledge that you — the actual you, not the imagined you — might *be wrong*. For all your evidence, it seems that you can imagine *being mistaken*, imagine really discovering that water is not H_2O, imagine it really turning out that water is not H_2O. Kripke disagrees. Insofar as we take ourselves to be imagining discovering that *water* really is XYZ, not H_2O, we are mistaken. That isn't what we imagine. We imagine instead a situation in which 'water' refers to something other than water. Thus whether the situation imagined is an epistemic possibility, whether imagined "as actual" or imagined "as counterfactual," Kripke insists that we do not imagine the impossible situation we take ourselves to imagine.[11]

I conclude there is ample evidence that Kripke endorses Unimagined and Confusion, thus subscribing to the Error Theory about imagining. Is the Error Theory correct?

2   Imagining Impossibilities

Set aside modal truths and modal epistemology for a moment. On their own, how plausible are Unimagined and Confusion? How plausible is it that we cannot imagine certain impossible situations, and that we make mistakes about what we imagine when we try to?

I contend: not very. Leaving aside modal considerations, Kripkean claims about imagination should strike us as implausible. On our commonsense understanding of imagination, the answer to (Q1) is yes.

Let's begin with an example that shows we are not usually wrong about what we imagine. You are picking up Michael, who you've never met, at the airport and you imagine him having brown hair. When he arrives and turns out to be redheaded, you do not conclude: "Oh, I didn't really imagine him at all. It seemed to me that I was imagining him, but this guy has red hair, so I must have been imagining someone else." That's a misguided reaction. You were indeed imagining Michael, just not as he really is. There's no mistake about that.

The Error Theory entails that in scenarios very much like the first airport case, you are making a mistake. Suppose that Michael turns out to be a woman (there are some women named "Michael") and further, suppose that biological sex is necessary. The Error Theorist will contend that now you should retract: "Oh, I didn't really imagine that person at all. It seemed to me that I was imagining Michael was a man, but Michael is a woman, so I must not have been imagining Michael at all." That too seems like a misguided reaction. You were indeed imagining Michael, just not as she really is. (You might laugh and tell her, "I imagined that *you* were a man!") Why think there's mistake about that? And notice that according to the Error Theorist whether or not you are making a mistake hinges on the truth of our supposition about the necessity of biological sex. That too seems implausible. The only reason

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[10] See also Yablo (1993, pp. 23–24) for discussion of epistemic possibility.

[11] Chalmers does not, by the criteria I have just articulated, count as a Kripkean. He allows that we can genuinely imagine water is XYZ. Of course he thinks that this is possible, in the relevant sense of possibility (what he calls "primary possibility"). His two-dimensional semantics raises a number of complications that requires separate treatment, so I set his view aside here.

to hold such a view is a prior commitment to imagining as something like a telescope through which we survey genuine possibilities. There is a better alternative.

My favored model pictures imagination as *constructing* scenarios out of existing materials rather than as a telescope through which we survey genuine possibilities. When we think about imagination as constructive rather than telescopic, it becomes clearer how we can imaginatively construct impossible scenarios: we combine ingredients that together amount to an impossible situation. But the fact that the resulting scenario is impossible doesn't impede the construction. Further, given that we understand our construction materials, the suggestion that we are confused about what we imagine should sound peculiar. For example, I visually imagine my great-great-grandmother even though I have no idea what she looks like; maybe I form an image of a woman who resembles Madame Chiang Kai-Shek. That doesn't make it Madame Chiang Kai-Shek that I'm imagining. I'm imagining that the woman who looks *this way* is my great-great-grandmother. The question of how I *know* this — how I know that it is my great-great-grandmother I am imagining, rather than some other woman — doesn't really make sense. Wittgenstein makes this point with his King's College example (1980, p. 39). When one imagines King's College on fire, there's just no doubting that one is imagining *King's College*, and not something else, e.g., a similar-looking part of UCLA, or a miniature replica of the College. In general, when we imagine something there's just no doubting that we have imagined that something.

The construction model respects commonsense about imagination's flexibility and power, including our power to imagine the impossible. Time travel offers a nice example. Imagine that in the present a teenager's father is "initially" an ineffectual loser with a crappy job who is pushed around by his boss. Imagine the teenager travels back to 1955 in a DeLorean and, through a series of mistaken-identity-fueled madcap adventures, *changes* his father into confident leader. As we visualize a scene between the teenage son and his adolescent dad we imagine that the scene is taking place in 1955 for "the second time" — the "first time" through 1955 the son wasn't even born yet! To makes sense of the story we have to imagine something impossible, that thanks to the teenager's intervention, 1955 happens differently the "second time" through.

Ordinary constructive imagining is not concerned with possibility. When we reflect on "Back to the Future" time travel we might realize that the situation is impossible: 1955 could not happen "twice." But unless we're fixated on imagining (only) metaphysical possibilities, that won't prevent us from constructing the time travel scenario in imagination. We might realize that the situation we're imagining is impossible, but we still happily follow along with the story and imagine it. Reading philosophy of time travel might spoil the story because we realize that, sadly, in reality there's nothing we can do to change the past, but it doesn't spoil the story by rendering it *unimaginable*. I conclude that when we reflect on what and how we imagine "in everyday life," as when we imagine Michael turning out to be a woman, or past-changing time travel, it is plausible that we can imagine the impossible.

Let me now offer several more examples to solidify the reader's intuitions.

I imagine myself receiving the Fields medal for proving Goldbach's conjecture. Imagine renowned mathematicians marvel; given my limited background, they reckon my discovery to be the most startling since Ramanujan's. It is clear that I imagine (and I suggest that you also have imagined too) that I *really have proved it*. I imagine that my Fields medal-winning journal article contains the proof. I am not imagining myself as some kind of

charlatan; my imagining would have quite a different character if I were.

I can also engage in a similar imaginative project: I can imagine disproving Goldbach's conjecture. Now maybe if this were to actually happen it would be a more stunning feat, because most mathematicians believe the conjecture to be true. That's irrelevant.[12] My imaginings do not contain any mathematical detail. I do not imagine any steps in my prize-winning proofs; I cannot snap out of my reverie and snap my fingers, say "That's it!" and start writing. I'm simply imagining some heretofore undiscovered, yet, as far as my imagining goes, *unspecified*, mathematical details that I have miraculously managed to uncover.

Once we acknowledge that we routinely imaginatively construct the impossible, there is no reason to treat Kripke's cases any differently.[13] Again, setting modal claims and modal epistemology aside, it is plausible that we can imagine the following cases:

- Not only can I imagine that my great-great-grandmother *resembles* Madame Chiang Kai-Shek, I can imagine that my great-great-grandmother *is* Madame Chiang Kai-Shek. I picture a woman in my mind's eye and that picture comes labeled as my great-great-grandmother, Madame Chiang Kai-Shek. We have no problem admitting that I can entertain the thought that my great-great-grandmother is Madame Chiang Kai-Shek, or fantasize about my great-great-grandmother being Madame Chiang Kai-Shek. Why should we treat imagining it any differently?

  My great-great-grandmother isn't Madame Chiang Kai-Shek, of course, and with a birth year circa 1898 Madame Chiang is too young to be my great-great-grandmother. This doesn't stop me from being able to imagine that she is my great-great-grandmother. Nor does the fact that, if Kripke is right about the necessity of origins, it is *impossible* for Madame Chiang Kai-Shek to be my great-great-grandmother.

- I imagine two eighteenth-century men fighting. One, Mark Twain, dressed in the simple clothing of a riverboat pilot, shouts angrily at the second, a white-haired white-suited Samuel Clemens. Twain accuses Clemens of stealing his life's story and then stuns him with a quick jab to the chin. I imagine the white-suited figure is Clemens and that the other man is Twain, just like I imagine at the airport that Michael is a redhead. According to Kripke, the situation I imagine is impossible. It is necessary (and *a posteriori*) that Twain=Clemens. Nonetheless I imagine it.

- I imagine that water, the clear liquid filling the rivers and lakes, falling from the sky, coming out of the taps, and so on, has chemical structure XYZ, and that XYZ $\neq$ H$_2$O. I imagine the clear liquid is water just as I do in more mundane imaginings, like when I imagine my great-great-grandmother drinking a glass of water. Of course, according to Kripke, I've imagined something impossible.

- Variation: I imagine scientists making a shocking announcement: water, the clear colorless odorless tasteless liquid that covers 71% of the earth and is essential for life, is composed

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[12] I, the imaginer, needn't be aware that most mathematicians believe the Conjecture to be true. I think either way I can imagine disproving the Conjecture. In fact I'd go so far as to claim that I can imagine the Conjecture to be true or false even if I'm not entirely sure what the Conjecture is. E.g., I can imagine proving the Taniyama–Shimura conjecture even though I have a very tenuous understanding of what the Taniyama–Shimura conjecture is.

[13] In section four I'll offer a theory of constructive imagination; a consequence of that theory will be that imagining the falsity of an *a posteriori* necessity is no different than imagining any other situation.

of previously undiscovered XYZ molecules, and not H_2O molecules as scientists previously thought. I am imagining scientists, and hence myself, being *wrong* about the composition of water. If in the scenario the scientists aren't making an announcement about *water*, then I'm not genuinely imagining anything shocking, I'm not imagining that everyone was *wrong* about the composition of water. But it seems clear that this is what I in fact imagine. I take this to be what we imagine when we imagine what Kripke calls the epistemic possibility that water is not H_2O. As in the previous case, I imagine that water≠ H_2O, which Kripke deems impossible.

▪ Second variation: I imagine that I — the *actual* me — am wrong about the composition of water. In the situation I imagine, there are no people, so I'm not merely imagining that the *imagined* me is mistaken about the composition about water. There is no imagined me in my scenario. To do this, I've got to imagine that water is not composed of H_2O, otherwise I haven't imagined *actually being wrong*.

I conclude that, setting modal considerations aside, Unimagined and Confusion are implausible. The construction model offers a better way to understand everyday imagining then the telescopic model. And in everyday imagining there is nothing puzzling about constructing situations that turn out to be impossible. (In section 4 I'll give a theoretical account of the construction model that will explain how we construct impossible scenarios in imagination.) Imaginings are contentful states of mind and we are generally not confused about the contents of our own mind. Insofar as the Kripkean strategy rests on Unimagined and Confusion, it too is implausible. We should see whether a better explanation is available.

3   Not Unimaginable, but Fragile

One thought is that Kripke's remarks can serve as the foundation for a better explanation. Kripke's remarks were informal, and neither intended to lay out a detailed theory of imagination nor a comprehensive modal epistemology. Yablo (1990, 1993, 2006) admits that blunt assertions of Unimagined and Confusion are implausible, but that is because they are overly broad. Kripke's point should be that *given enough information* we cannot imagine certain impossible situations. Our ability to imagine what turns out to be an impossible situation is explained by our *ignorance* of that information. To give a name to contrast with the telescope and construction model, we might call this the *doxastic* model: once you believe the relevant facts, what was once imaginable becomes unimaginable.

I believe the points from the previous section are enough to show that Yablo's elaborations cannot be correct. In this section I'll outline Yablo's analysis of several cases and argue that he too must make implausible claims about imagination.

Here is Yablo's view. Yablo endorses 2), that imagine provides evidence for possibility, yet he concedes that sometimes we imagine impossibilities, like when 3) we imagine the falsity of *a posteriori* necessities. However he thinks these errors often follow a recognizable pattern. Let p be the impossible proposition conceived.

a. q

b.   if q then necessarily not-p

c.   that I find p imaginable is explained by [my unawareness|my denial] that (a), and/or

[my unawareness|my denial] that (b).[14]

In some cases your imagining *p* is explained by your unawareness or denial of a *defeater*. Ignorance *facilitates* imagining impossible situations. As we will see below, in some cases *q* is a fact about the actual world, in others it is a modal fact. Yablo proposes that when we don't know the relevant *q*, we can imagine that *p*, but such imaginings are *fragile* in the sense that once our ignorance of *q* disappears, we can no longer imagine the impossibility. Let's see what Yablo says about the cases we have discussed.

"Ordinary" identities

The ancients might very well have imagined Hesperus distinct from Phosphorus. But they could do so only because they were ignorant of the fact that Hesperus *is* Phosphorus.[15]

> "But we could imagine veridically believing them to be distinct, back when we thought they *were* distinct." True but irrelevant; it remains that *Hesperus ≠ Phosphorus* is *now* epistemically possible, but *not* now [imaginable]. (1993, p. 23n48).

Once we learn that Hesperus=Phosphorus, that renders Hesperus≠Phosphorus unimaginable — provided we know the relevant modal facts.

Pre-Kripke most (all?) philosophers and ordinary folk could imagine Hesperus distinct from Phosphorus, though they knew them to be identical. In this case, they were ignorant of the modal fact that Kripke proved: if H=P, then $\Box$(H=P). Once apprised of this modal fact, Hesperus≠Phosphorus becomes unimaginable — provided we believe the modal fact.

Post-Kripke nothing changes for ordinary folk. But philosophers aware of Kripke's writings may still imagine Hesperus distinct from Phosphorus if they deny the above modal fact. If they know both the modal fact and that Hesperus=Phosphorus, then Error Theory delivers the right result: we cannot imagine Hesperus≠Phosphorus. We imagine some similar situation that we mistake for one in which Hesperus≠Phosphorus.

Necessity of origins

Similarly, Oedipus can imagine the impossible situation of himself being king without Jocasta ever existing only because i) he falsely believes that Jocasta is not his mother; and ii) he is unaware of cogent Kripkean argument for the necessity of origins. [16]

Goldbach's conjecture: Undecidable propositions

Yablo's position on Goldbach's Conjecture (GC) is that neither it nor its negation is imaginable. The best we can do is imagine a situation in which mathematicians erroneously hail the discovery of a counterexample to Goldbach's Conjecture. Symmetry between GC and not-GC considerations prevents us from imagining that the number is in fact a counterexample. Yablo concludes that not-GC is not imaginable; but neither is it unimaginable; Yablo calls not-GC undecidable.[17]

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[14] I have swapped "imagine" for "conceive" here, which is consistent with the position Yablo takes in his (1993).

[15] Yablo (1993, pp. 23, 33–35).

[16] Yablo (1993, pp. 33–34, 39).

[17] Yablo (1993, pp. 10–12, 30–32).

Scientific identities

Some scientific identities, like water=H_2O, are to be treated like "ordinary" identities. We can imagine them only in ignorance either of the fact that water=H_2O or of the fact that if water=H_2O, then $\square$(water=H_2O). When we seem to imagine discovering that water is XYZ, we are imagining a similar situation and mistaking it for one in which water≠H_2O.

This is a good place to point out another aspect of Yablo's account, his gloss on epistemic possibility (1993, §IX). When impossible *e* seems imaginable, that's because you could have thought something true with the "same *e* thought" — roughly, the same internal mental act. Had you been in a different situation, say one in which XYZ had fallen from the sky and filled the rivers and lakes, then you could have thought something true with your *water-is-not-H_2O-thought*. But the "same internal mental act" in the counterfactual situation would not have expressed the proposition that water is not H_2O, so you are not literally imagining that water is not H_2O.

Recently Yablo has developed a more complex treatment of some scientific identities, like heat is mean kinetic molecular energy. The details do not matter for our purposes, so I set them aside.[18]

I argue that Yablo's analysis of each one of these cases is incorrect. His doxastic model conflates what is *believable* with what is imaginable. You might not find something believable or possible, yet you can imagine it nonetheless.

The cases I described in the previous section remain imaginable even if we believe the relevant actual world facts (Twain=Clemens, water=H_2O, I am not related to Madame Chiang Kai-Shek, and so on) and even if we believe the relevant modal facts (if T=C, then $\square$[T=C]; if water=H_2O, then $\square$[water=H_2O]; origins are necessary). Take the actual world facts first. We imagine, for example, Twain punching Clemens by imagining the puncher as Twain and the punchee as Clemens. True, in so doing we imagine that an actual world fact does not obtain. But the *whole point* of imagining is to imagine that certain actual world facts don't obtain. So far there is no reason to adopt Yablo's suggestion that adding a belief about the actual world facts will change what we find imaginable. This construal of the doxastic model fails.

Perhaps Yablo can respond that while, yes, we can imagine the empirical facts are different, we cannot imagine that water≠H_2O while "holding water=H_2O fixed." This suggestion has been developed at length by Gregory (2004); in Gregory's terminology we cannot imagine water=H_2O "under the supposition" that water=H_2O.[19] The thought here is

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[18] In his (2006) Yablo argues that it is harder to satisfy Confusion than philosophers, including Kripke, initially realized. To make it convincing that we confuse imagining S′ with imagining S, we have to find an S′ in which everything would seem the same to us *as we are*. We can do this in the water-XYZ case: We *as we are* could confuse some other clear liquid, XYZ, for water. But contrary to what Kripke things, we *as we are* could not feel low mean molecular kinetic energy (LMMKE) as heat. To feel LMMKE as heat we would have to be neurally different from the way we actually are. That, Yablo argues, makes the charge that we are confused about what we imagine implausible.

[19] There's some support in Kripke's writings for such a view, e.g., "I could find out that an ingenious trick has been played upon me and that, in fact, this lectern is made of ice; but what I am saying is, given that it is in fact not made of ice, in fact is made of wood, one cannot imagine that under certain

that of course we can imagine departures from actuality; however if we *suppose* that water is H_2O and bear that supposition in mind while we imagine, we will not be able to imagine non-H_2O water. To assess Gregory's proposal, we need to examine the interesting question of what actual world facts we *import* into our imaginings; that is, which actual world facts do we automatically include in our imagined scenarios. E.g., when I imagine that Justin Timberlake gives an impromptu concert on the Art Museum steps in Philadelphia, it also seems true in my imagining that Philadelphia is in Pennsylvania; that Philadelphia is in Pennsylvania is imported.[20] We can now ask: Are suppositions automatically imported into an imagined scenario?

When instructed to "Suppose that *p*, then imagine that *q*" or to "imagine that *p* under the supposition that *q*," it is natural to take that as an exhortation to import *p* into your imagining, i.e., to imagine that *p* and *q*. So of course when *q* obviously entails not-*p*, that is tantamount to asking you to imagine a contradiction, and it is no surprise that we can't do that. But if we are clear that the supposition holds for the actual world only, that we aren't necessarily being asked to import, then I think we can suppose that *p* and imagine that not-*p*. Why? Because once the ground rules are clear, *p* is just (supposed as) an actual world fact, and we are free to depart from actuality in imagining. A few examples should make this clear: suppose that Santa Claus has never and will never exist. Can you imagine Santa Claus coming down the chimney? Seems clear that you can.[21] Suppose that I weigh 145 pounds. Can you imagine that I weigh 210? Again, yes. You imagine that I am heavier that I (supposedly) actually am.

These cases highlight the difference between our three models. On the telescope model, if you suppose that I weigh 145, can you discover that I weigh more? Perhaps not. On the doxastic model, if you suppose that I weigh 145, can you find it believable that I weigh 210? Perhaps not. On the construction model, even if you suppose that I weigh 145, you can still easily construct an imagined scenario in which I weigh more; you can imaginatively pack more pounds onto me. The construction model explains the intuitive result, that we can imagine variations from the way the actual world is or is supposed to be.

I conclude that neither learning real world facts, nor supposing real world facts, prevents us from imagining that those real world facts are different. Hence Yablo cannot appeal to learned or supposed real world facts to support his contention that once we learn certain facts, a previously imaginable situation becomes unimaginable.

Now what about Yablo's suggestion that learning a *modal* fact renders a previously

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circumstances it could have been made of ice" (1971, p. 153). See also Yablo (1993, p. 34n66), who refers to the Ramsey test and pretending rather than supposing, and Soames (2007): "But given the supposition that the original state is instantiated, one can conceive of *no* state possible relative to it in which that very desk was (originally) made of some other material—e.g. oak or metal" (p. 292).

[20] The "import/export" terminology is from Gendler (2000). In that paper Gendler discusses import/export laws governing moral facts. I import Philly is in Pennsylvania into my imagined scenario even if I haven't given Pennsylvania any explicit thought; note the analogy to truth in fiction. See, e.g., Walton (1990, ch. 4).

[21] A similar case: suppose that there never was a Sherlock Holmes. You can still imagine Holmes investigating a murder in the Philosophy Department library. If you agree with Kripke about fictional characters, then the supposition entails that there *could not be* a Sherlock Holmes. Still the situation remains imaginable.

imaginable scenario unimaginable? There's a simple response and a more complex response. The simple response reiterates the point above. We derive some modal facts (e.g., $\Box$[water=H_2O]) from a modal conditional (if water=H_2O, then $\Box$[water=H_2O]) and an empirical fact (water=H_2O). Hence to imagine that the modal fact is false we need only imagine the empirical fact is false. We imagine that some empirical facts, like the facts about water's composition, are different from what they actually are; again, the whole point of imagining is to imagine that some empirical facts are different.[22] Yablo has no way to accommodate this objection.

For the complex response, we need to look more closely at what Yablo takes imagining to be. Yablo insists that the kind of imagining he's talking about must include the "appearance of possibility." Just as perceptual experience presents an "appearance of actuality" — it is veridical only if things are as they appear, and inclines one towards belief — imagining must present the "appearance of possibility" — it must be veridical only if things *could* be as they appear, and inclines one toward belief that *p* is possible.[23] The latter clause is why I say Yablo adopts a doxastic model . There is a connection between the two threads: imagining a world in which *p* is true is to *thereby* enjoy the appearance that *p* is possible.[24] Yablo alleges the appearance of possibility is absent in Goldbach's conjecture cases.

> Sometimes when we find ourselves unable to conceive a proposition, we don't find it inconceivable either; its modal status is undecidable on the available evidence. Despite what you often hear, this is how it is with Goldbach's conjecture. No thought experiment that I, at any rate, can perform gives me the representational appearance of the conjecture as possible or as impossible, or the slightest temptation to believe anything about its modal character. (1993, p. 11)

Why is there no appearance of possibility? In the previous section I claimed to imagine *really having proved* Goldbach's conjecture false. In my fantasy I win the Fields medal for *in fact* disproving Goldbach's conjecture; my fantasy doesn't leave it open whether Goldbach's is true or false: it's false, and I've proved it's false. By Yablo's reckoning, this should mean that I *thereby* enjoy an appearance that such a proof could exist. Yablo disputes that I do enjoy an appearance, reasoning as follows: Well, we know that whichever way Goldbach's conjecture turns out, true or false, it will be necessary. You cannot imagine a *correct* proof or disproof not-GC because

> it is inconceivable to me that addition facts should vary between possible worlds, [so] my ability to imagine the proof as correct is limited by my confidence that some number is in fact unavailable as the sum of two primes. Alas, I have no idea whether such a number exists, and neither (I assume) does anyone else. (1993, p. 32)

This is unconvincing. Yablo simply *asserts* that imagination will not violate the modal facts.

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[22] Yablo might object that this imagining does not present an "appearance of possibility." More on that in a moment.

[23] Yablo (1993, §II)

[24] Yablo (1993, 29–30). Returning to footnote 22, on this analysis, Yablo cannot say imagining water is not H_2O (while acknowledging that water is necessarily H_2O) fails to present the appearance of possibility. Imagining water is not H_2O *thereby* presents it as possible. But not only is this what Yablo has to say, it is intuitively the right thing to say. It does seem possible that water is XYZ, even if it is not possible. It's this illusion of possibility that generates puzzles in modal epistemology, and creates the need for Kripke to explain away the appearance of possibility.

Yes, it is true, we doubt whether a counterexample to GC actually exists. We realize that a counterexample would necessarily be a counterexample. That is why in imagination we have to invent an unspecified counterexample, just like we invent unicorns by imagining horse-with-horn-shaped creatures as unicorns. But none of these considerations show that imagining a unicorn or imagining a counterexample to GC fails to enjoy the *appearance* of possibility. Though we realize (let's suppose) that these are impossible, imagining them continue to make them *seem* possible, just like it still *appears* that the lines in Müller-Lyer illusion are different lengths even when we know them to be the same. Since we have been given no independent reason to think that the appearance of possibility is sculpted to fit the modal facts — i.e., we have been given no reason to think the GC case isn't an illusion of possibility — Yablo's assertion is simply implausible.[25] There are illusions of possibility, and the cases from section two seem like prime examples of them. I conclude that learning modal facts renders a previously imaginable scenario unimaginable; we can continue to enjoy what we know to be illusions of impossibility.

To sum up: I have argued that the right answer to (Q1) is yes: we can imagine impossible situations. And I have also argued that the right answer to (Q2) is yes: we can imagine impossible situations even after we learn that they are impossible. Our commonsense notion of imagining allows that just as it's easy to construct scenarios that are, in fact, false, it's also easy to construct scenarios that are, in fact impossible. Hence I have already raised a significant puzzle for Kripkean views: explain why commonsense is wrong without merely asserting that we cannot imagine the impossible. That will be a difficult puzzle for Kripkeans to solve.

A Kripkean might respond that my discussion neglects Kripke's insights about necessary truths. The Kripkean theory is the best theory we have connecting imagination, modal evidence, and *a posteriori* necessity. My reply: even if the Kripkean view is the best theory we have connecting these different areas, that does not remove the implausibility, and it doesn't show that Kripke has a satisfactory view of imagining.

The paper could end here with the puzzle. But now I want to elaborate on how a construction model of imagining dissolves the puzzle. The construction model better explains the connection between imagination, modal evidence, and necessity. The model below explains how we imagine the impossible. But this needn't start us worrying about whether Kripke is wrong about *a posteriori* (and other) necessities, because we have independent reason to deny that those imagined impossibilities are evidence for possibility. Let us turn to that alternative view now.

4 An Alternative Explanation

My aim in this section is to describe an alternative theory of imagination that gives us

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[25] It is doubly peculiar given the dialectical context of Yablo (1993) that he makes this assertion. In that paper he endeavors to vindicate conceivability as evidence for possibility by arguing that conceivability isn't systematically misleading. His opponent points to the conceivability of not-GC as an instance where conceivability misleads about necessary truth. Yablo's response seems to amount to: well, if we imagined not-GC, that we would be imagining a necessary falsehood, and we don't believe that's possible, so we can't imagine *that*. But his opponent retort that, yes, of course it's a necessary falsehood, and that is why the case was introduced to show that conceivability *is* systematically misleading.

everything we want from the Kripkean view without the Error Theory. We can respect the commonsense view that we imagine the impossible yet retain Kripke's conclusions about *a posteriori* necessities because we have *independent reason* to deny that those imagined impossibilities are evidence for possibility.

I'll describe my proposal in two stages. First I'll offer a constructive theory of imagination and describes how, according to it, we can imagine the impossible. The second stage explains the modal epistemology for my theory and how we can reconcile imagined impossibilities with *a posteriori* and other necessities. In the paper's final section, section five, I illustrate how my theory arrives at different verdict than Kripke's on a famous case.

4.1 Theory of Imagination

Let's start with a discussion of how exactly imagining various scenarios works. We'll concentrate on one kind of everyday imagining: sensory imagining. Sensory imagining involves *mental imagery*. Visualizing, for example, involves "picturing in your mind's eye." When you visually imagine intercepting the football to give the Philadelphia Eagles their first Super Bowl, you picture yourself in a green and white Eagles uniform outjumping a Steelers receiver, and snatching the brown oblong football from just beyond the receiver's outstretched hands. How should we theorize *what* you imagine, the *content* of your imagining? Here's a simple distinction to start: some content of your imagining, the *qualitative* content, comes from the "picture" itself. That your uniform is green, for example, and that the football is brown. That your face has the particular appearance it has. The rest of your imagining's content is *assigned* (often the assignments are *about* the mental picture). In addition to surfaces, colors, shapes and so on that you picture, you were also imagining *yourself* catching the ball; your imagining was *about* yourself. You were imagining that you're playing in the *Super Bowl*. These facts are assigned.

Though the qualitative/assigned distinction is a fairly intuitive, making it precise will require some work. I will lean on an account of imagination that I have worked out in some detail in Kung (forthcoming).

My view of imagination's *basic qualitative content* borrows from the philosophy of perception. I assume that perceptual experiences have representational content that present in a direct and immediate way aspects of the world around us, aspects that we might ordinarily say we are conscious of: they specify the distribution of objects and "basic observational" properties in three-dimensional (egocentric) space. Basic observational properties include at least the traditional primary and secondary properties. In vision, for example, we are consciously presented with three-dimensional space filled with objects of varying colors and shapes. Sensory imagination also has basic qualitative content. When you visually imagine the football field, your imaginative experience presents greenish flat object stretched out in space. Imaginative experience isn't presenting aspects of the actual world around us, but it is presenting "basic observational" properties in imagined space.

Assigned content isn't pictorial. To get a better feel for assigned content, imagine that in the Super Bowl you are matched up against your identical twin sibling. What makes *you* the one in the green and white jersey (the Eagles colors are green and white) and your exactly similar looking *twin* the one in the black and gold jersey (the Steelers wear black and gold)? Assignment. Now imagine a slightly different situation: your twin, playing cornerback for the Philadelphia Eagles, intercepts the ball over your outstretched fingers in the last game of the

regular season to send the Eagles to the playoffs. The picture — the phenomenal character in your mind's eye — remains the same, yet you imagine something different. Assignment makes the difference. In the second situation, it is assigned that your twin is the Eagles player, that you are the Steelers receiver, and that it is the last game of the regular season.

Let's be a little bit more precise about assigned content. Some assigned content is assigned to "pictured" items. The basic qualitative content provides, in the visual case, the "purely pictorial" content described above. But the various objects, regions, surfaces, and so on presented by the mental image come already categorized; they have conceptual contents already assigned. In imagining my twin playing cornerback, I conjure up a certain mental image. The image depicts a figure who appears a certain way, and this figure is simply imagined *as* my twin. This requires no extra activity on my part — I don't have to examine my mental imagery and recognize the figure depicted — the figure in the image comes pre-labeled with the concept <my twin>. These labels are one kind of assigned content. An imagining of my twin will have a great many other labels that encapsulate quite a bit of information: the large round object is labeled <head>; the protuberance on the head is labeled <nose>; and so on. If the o_i are imaginary objects presented by the mental image ("object" should be understood quite loosely, to include regions, stuffs, events, etc. as well as proper objects), then the label content might be: that o_1 is F; that o_2 is F and o_2 is G; that o_3 is F and o_3 is G.[26]

A second kind of assigned content is *stipulative content* — propositional content that goes above and beyond that of the mental image. Some assignments do not reference anything in the mental image; they fill in background information about the imagined situation (e.g., that it is Super Bowl Sunday). Others make claims about objects in the mental image. When I imagine that my twin and I are long-time friends, the mental image depicts the green-jerseyed figure imagined *as* me and the black-and-gold jersey's figure as my twin: the figures are labeled with the concepts <Peter Kung> and <my twin> respectively. That the two are friends is stipulated; nothing in the image is imagined as our friendship.

The term "assigned content" is a loose way of referring to all information captured by labels and stipulations; any piece of this information is an *assignment*. Assigned content covers background stipulations as well as the labels and stipulations made about the objects presented by the mental image. It also covers whether these labels and foreground stipulations are made of the same or distinct objects. Here's how this plays out in our football example. Again, think of basic qualitative content as presenting a domain of "things." Assignments include content like $(\exists x_1)(\exists x_2)(\text{IsPeter}(x_1) \ \& \ \text{IsPeterTwin}(x_2) \ \& \ x_1 \neq x_2)$, which says that two *distinct* things pictured are Peter and my twin. Imagining a different case, where the same person has two names, would have assigned content like $(\exists x)(\text{IsPeterParker}(x) \ \& \ \text{IsSpider-Man}(x))$, which says that a *single* the thing pictured is both Peter Parker and Spider-Man.

That is the qualitative/assigned content distinction. One final clarification to head off an understandable confusion. The term 'assigned' invites a distorted perspective of imagination's phenomenology — it incorrectly suggests that imagining is a two-stage affair, where we first conjure up some qualitative mental "picture" and then assign various labels to

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[26] Labels capture the sense in which an experience, either perceptual or imaginative, can have a richer content than just primary and secondary properties, as Siegel (2006) and Siewert (1998) argue. Following Siegel and Siewert I assume that you perceive a nose and a head, rather than just nose-like and head-like shapes; label content provides non-basic qualitative content of an experience.

the "picture" and make various stipulations about it. Imagination does not work this way; there is no second stage. The imagery comes with everything already assigned.

The view I just sketched is a construction model of imagination. Imagined scenarios are built up out of contents, some "pictured," some labeled, some stipulated. How does this constructive view of imagination help us understand our ability to imagine the impossible? The key is assignments. Assignments are an integral part of imagination; imagination enjoys tremendous power and flexibility because we can assign what is the case in our imagined situation to an almost arbitrary level of detail. You can assign, for example, that your twin has a Justin Timberlake tattoo on his shoulder hidden beneath his jersey, or that the Steelers were undefeated heading into the Super Bowl, or that your twin owns a kitten named Ripley. Recalling an example from section two, I can assign that the woman I am picturing is my great-great grandmother; I can do this despite having no idea what she really looks like. And not only can I imagine my great-great grandmother *resembles* Madame Chiang Kai-Shek, I can imagine that she *is* Madame Chiang Kai-Shek. My mental picture comes labeled with both <great-great grandmother> and <Madame Chiang Kai-Shek>, just like your mental picture of the Eagles cornerback comes with the label <my twin>.

The last example, imagining that my great-great-grandmother is Madame Chiang, is an example of imagining the impossible. We imagine impossible situations by virtue of incompatible assignments. Let's review our examples of imagined impossibilities from section two.

In imagining past-changing time travel, when we visualize the scene between the teenage son and his adolescent dad, we stipulate that the scene takes place in 1955 for "the second time" and that the son wasn't present — wasn't even born! — the "first time" through 1955.

I imagine proving Goldbach's conjecture by stipulating that I really have proved it. I stipulate that the Fields medal-winning journal article contains the proof. That stipulation is key: I do not imagine myself as some kind of accidental winner, who has mistakenly garnered the praise of mathematicians because nobody has realized that my proof contains an error. That's a very different imagining. I imagine by stipulation that I *deserve* to win because my article contains a genuine proof. The same story goes for when I imagine disproving Goldbach's conjecture.

To imagine Twain punching Clemens, I picture a figure in a white suit and label this figure <Clemens>; I picture a figure in overalls and label him <Twain>. I see in my mind's eye the Twain figure punching the Clemens figure. This is very like imagining me and my twin playing in the Super Bowl.[27]

I visualize a clear substance flowing in rivers and falling from the sky. As I usually do when I imagine people drinking water, I label this substance as <water>. In this case I also label the same stuff <XYZ> and stipulate that XYZ≠water.

Each of the examples we just reviewed is an instance of imagining the impossible. The analysis of these cases show how imagining impossible situations is continuous with everyday

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[27] What I picture includes a number of other assignments: that the curled up thing is a fist, for example. I do not aim to give an exhaustive analysis of any one case. I simply want to make it plain that we can imagine impossible situations via assignments.

imagining. Just as we construct via assignment all matters of detail about our imagined situations, we can construct via assignment incompatible details. There is nothing peculiar or especially noteworthy about our ability to imagine impossible situations.

4.2 Modal Epistemology

This constructive model of imagining leaves one important loose thread. If we can imagine impossible situations, doesn't that show that, contrary to what some philosophers assume, imagining cannot serve as evidence for possibility?[28] I want to show now that we needn't accept this conclusion. We can salvage Kripke's insights about *a posteriori* necessities — and explain away other imagined impossibilities to boot (like time travel and Goldbach's conjecture) — by paying attention to *how* we construct impossible situations in imagination. As the reader might already have guessed, assignment is again the key.

Let's call imaginings that provides evidence for possibility *probative*. My driving thought is that some imaginings are not probative, and, importantly, we can see this on *independent* grounds, using general epistemological principles. We needn't arrive at our modal conclusions first and then infer after the fact whether we were or were not imagining what we thought we had imagined — a good thing, since if imagination serves as evidence for possibility it should play a crucial role in *forming* our modal conclusions. "Modal conclusions first" views of imagination, like the telescopic and doxastic models, seem to get the order of explanation reversed.[29] It is preferable to have independent grounds for determining whether an imagining is probative.

What are these independent grounds? In slogan form, the claim is that "assignment makes imagining the impossible possible." Roughly, an imagining that *p* will not be probative if *p*'s truth in the imagined situation follows from the assignments alone. As I argue at length in Kung (forthcoming), the reason is that assignments are virtually unconstrained, and what minimal constraints there are have no modal evidential value.

Why should we accept this claim? Let's first reflect on what we are unable to imagine. It seems to be an empirical fact, for example, that we are unable imagine the sound of an ultrasonic dog whistle. To be more precise, we are unable produce ultrasonic sounds "in our mind's ear"; we can't accurately imagine qualitative ultrasonic sounds. Neither can we visualize a shape that is both round and square. Qualitative content is empirically constrained by what kind of mental imagery we can produce.

Assigned content, on the other hand, has fewer if any constraints. If assignment has no constraints at all — if for any *p*, we can imagine that *p* via assignment — then imagining via

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[28] In addition to Yablo (1993, 2006), explicit defenders of imagining as a guide to possibility include Chalmers (2002), Geirsson (2005), Gendler (2000b), Gregory (2004), Hart (1988), Hilll (1997), and Kung (forthcoming). Many, many others assume it without argument, e.g., from (famously) Hume (1978) to Nagel (1974) to Lewis (1986).

[29] It is unclear to me how the telescopic and doxastic models work in practice. Witness: We seem to imagine that *p*. However *p* is impossible, so we can't be imagining that *p*. But why should we be so confident that *p* is impossible? If we take imagining to provide evidence for possibility, why shouldn't we conclude that *p* is, after all, possible? We seem to imagine that water$\neq$H$_2$O. Because necessarily, water is H$_2$O, we can't be imagining water$\neq$H$_2$O. But why should we be so confident that necessarily water is H$_2$O? Why shouldn't our initial imagining instead force us to conclude, e.g., that water$\neq$H$_2$O, that water and H$_2$O are coincident but not identical?

assignment provides no evidence for possibility because it fails to discriminate between possible and impossible *p*s. Imagining via assignment would be no more probative than supposition.

I am inclined to accept that, as an empirical fact, there are some things we are unable imagine, even via assignment. It is difficult to imagine via assignment that 1+1=79, for example. Here is a tentative proposal that explains our difficulty: the principal constraint on assignment is absolute certainty. By 'absolute certainty' I mean the strongest possible psychological certainty: to have absolutely no doubts at all, for there to be nothing one is more certain of.[30] This kind of absolute certainty marks the *cogito* and very few other propositions. I'll assume that psychological certainty confers the very best epistemic status.[31] I propose: so long as we find *p* *believable* — true for all we know with absolute certainty — we will be able to imagine *p* via assignment. This suggestion has a plausible commonsense explanation. In being less than absolutely certain that a proposition is true, we leave a tiny bit of room to imagine a way for it to be false. For propositions that are absolutely certain, there isn't even this tiny bit of room. I am extremely confident that I have hands. But I am not absolutely certain of it; I can imagine a skeptical scenario in which I don't. On the other hand because I am absolutely certain that 2=2, I can imagine no way for it to be false.

Let *p* be some proposition whose possibility we are trying to establish via imagining. The mere fact that we find *p* believable, and hence are capable of making the assignments required to make *p* true in the imagined situation, provides no evidence for *p*'s possibility. Believability just is lack of absolute certainty. (Let us use 'non-certainty' to denote lack of absolute certainty; it avoids the unwanted connotations of 'uncertain'.) It would be very odd if *non-certainty* counted as evidence of *p*'s possibility. To be non-certain is to fall short of the very best epistemic position one can be in; how can failing to be in the best epistemic position be evidence for some proposition's possibility, particularly when we note that total ignorance is one way to fail to be in the best epistemic position?[32] We seek positive evidence for our claims of possibility, but assignments do not provide it; they may merely reflect our less-than-ideal epistemic position. What goes for each assignment individually goes for what follows from the assignments alone: if it is only by virtue of non-certainty that one is able to assign *q* and assign *r* in the same imagining, and *p* follows from the conjunction *q* & *r*, then this imagining does not provide evidence for *p*'s possibility.

While there may be other constraints on assignments, they also provide reason to doubt that assignments are evidence for possibility.[33]

Let me emphasize that if the reader rejects my proposal that assignments are constrained by absolute certainty, this does not salvage imagining via assignment as evidence for possibility. If there are *no* constraints on assignment — if we can imagine *anything* via assignment, including 1+1=79 or there are round squares — that makes the modal

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[30] See Unger (1975, ch. II).

[31] See Reed (2008) for a discussion. Note that rejecting the assumption that psychological certainty confers epistemic status only undermines imagining via assignment as evidence for possibility.

[32] Note the similarity to Yablo (1993, §VII).

[33] For example, one other constraint has received attention in the recent literature is the puzzle of imaginative resistance (Gendler 2000a). See Kung (forthcoming) for my explanation why this constraint also carries no modal epistemological weight. The rough idea is that the absence of imaginative resistance is not an epistemic credit.

epistemological situation *worse* not better for imagining via assignment.

Now we have independent grounds to discount imaginings that rest on assignment as evidence for possibility. We've already seen in section 4.1 above how imagining impossibilities rest on assignment. Let's revisit those cases one last time.

Time travel. Imagine the teenager traveling back to 1955 and *changing* his father into a more assertive man. We visualize a scene between the kid and his adolescent dad we stipulate that the scene is taking place in 1955 for "the second time." For the scenario to really be one of past-changing time travel, we have to imagine that 1955 has already happened "the first time" (where, of course, the dad never met his teenaged son) and what we envisage is happening in 1955 the "second time." The crucial claim — that it is 1955…*again* — is stipulated. Hence this imagining provides no evidence that it is possible for 1955 to occur *again*.

Goldbach's Conjecture. When I imagine myself receiving the Fields medal for proving Goldbach's conjecture, recall that I stipulate that my medal-winning journal article contains the proof. The same thing is true when I imagine disproving the conjecture: I stipulate that my proof contains correct (but unspecified) mathematical details. In each imagining the key fact — that Goldbach's conjecture is true and I have proved it or that Goldbach's conjecture is false and I have disproved it — is stipulated. Hence these imaginings are no evidence that Goldbach's conjecture could be true or false. And that's a good thing: imagining is no substitute for actual proof.

Now let's turn to *a posteriori* necessities.

Identifying persons. We discussed two cases: imagining my great-great-grandmother is Madame Chiang Kai-Shek and imagining Mark Twain punching Sam Clemens on the chin. In each case, we assign the identity of the person: that this figure is great-great-grandmother Kung and that *the very same* is Madame Chiang; that the puncher is Twain and the *distinct* punchee is Clemens. In each case, those joint stipulations entail that, in the imagined situation, the relevant identity holds or does not hold. In the former, the stipulations entail that one thing can be both my great-great-grandmother and Madame Chiang; in the latter the stipulations entail that Clemens is distinct from Twain. Hence imagining provides no evidence that my great-great-grandmother could be Madame Chiang, nor does it provide evidence that it is possible that Twain ≠ Clemens.

Scientific identities. In imagining that water is not H_2O let's say we imagine a clear liquid filling the rivers and lakes, falling from the sky, coming out of the taps, and so on. We need at least two assignments to make this the right kind of case: we have to label the clear stuff as <water> and we have to stipulate that the same stuff has chemical structure XYZ, where XYZ≠H_2O. The fact that in the imagined situation water≠H_2O then follows from the assignments alone. According to my view, this provides no evidence that water could be XYZ, not H_2O.

This wraps up my discussion of modal epistemology. We now have a tidy story connecting imagination, modal evidence, and necessity that respects Kripke's insights about *a posteriori* necessity. Though we can construct impossible scenarios in imagination via assignment, we have independent reason to discount those imagined impossibilities as evidence for possibility. We get everything we want from the Kripkean view without the implausible Error Theory.

A final note on modal epistemology: The reader may wonder whether imagination is so rife with assignments that my skepticism about assignment-based imagining results in a general skepticism about imagining as evidence for possibility. That is indeed a legitimate worry. Answering that worry requires a lengthy and complex positive proposal for imagining as evidence for possibility, which I clearly do not have space for here. I offer that positive proposal elsewhere, in Kung (forthcoming).[34] For the purposes of this paper, it is enough to outline a plausible constructive theory of imagination and show how it retains and indeed explains Kripke's insights about *a posteriori* necessity. Remember also for comparison that Kripke does not offer positive argument that imagining is evidence for possibility, the third claim of his Error Theory.

5   Imagining Zombies

With the constructive model I described in section four we can say all that Kripke wants to say without adopting the implausible Error Theory.

Now if we can say all that Kripke wants to say, you might wonder whether my view is just a "notational variant" of Kripke's view. Where he says we can't imagine, what he really means is that we can't believe or discover to be possible. Or he means that we can't imagine in a way that is evidence for possibility.

I really doubt it is this simple. Kripke really does seem to talk about *what we imagine*, and he does seem to illegitimately slide from claims that something is impossible to claims that the same thing is unimaginable. But, regardless, I can demonstrate that my account is not a notational variant of the Kripkean account, because my account renders a very different verdict from Kripke's on an important case: zombies. Let's close by taking a look at what my account says about zombies.

Your zombie duplicate is exact physical duplicate of you that is completely non-conscious. Some dualists use zombie thought experiments in a modal argument for dualism: imagining a zombie provides evidence that zombies are metaphysically possible; given certain plausible assumptions, that zombies are possible entails that consciousness does not supervene on the physical. The details of the dualist argument need not concern us.[35] We focus on the questions: What is required to imagine a zombie duplicate? Does imagining a zombie provide evidence that zombies could exist?

In light of the considerations above, even committed materialists should admit that we do imagine zombie cases. Materialists who claim we cannot imagine zombies confuse what it takes to imagine something with a very high standard for providing evidence for possibility. The difficulty for materialists is that, in the absence of considerations to defeat the evidential value of the imagining, a brute denial that the imagining is probative looks ad hoc. But now we have the constructive model account. Let us see how assignments figure in imagining

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[34] A crucial thought is that even an imagining that includes assignments can serve as evidence for possibility if we can provide independent evidence that the assignment is possible. We might get that independent evidence from an imagining that doesn't merely assign the proposition in question. Alternatively, we might get that evidence if the proposition in question is actually true, because if it is true then it is possible.

[35] There are many versions of this argument, and Kripke's revival of it (1980) has sparked great interest in recent literature. See, e.g., Bealer (1994), Chalmers (1996), Jackson (1998), Levine (2000), Papineau (2002), Perry (2001) among many others.

zombies.

To imagine my zombie twin I picture in my mind's eye something who looks exactly like me. Let's call him/it Dieter. I imagine this creature, Dieter, typing on a computer on a sunny afternoon. Every now and again, Dieter takes a swig of coffee. I imagine that Dieter is not phenomenally conscious. There is nothing it is like to be Dieter: it is "all dark inside" for him/it.[36]

To make Dieter my zombie twin, I have to imagine two things are true: (i) that Dieter is a microphysical duplicate of me; and (ii) that Dieter has no conscious experience. I do this by assignment. Imagining a situation without *both* (i) and (ii) is not yet to imagine a zombie case. If, for example, I imagine someone who looks just like me and is *merely* assigned to have no conscious experience I have not yet imagined a zombie case because my imagining is consistent with Dieter's being microphysically dissimilar. The conjunction of these two assignments just *is* the zombie proposition: that there is something that is a microphysical duplicate of me and that the same something has no conscious experience. Considerations from the previous section show that this stipulation-based imagining provides *no* evidence that zombies are possible. This marks a clear difference from Kripke's verdict on this case.

Let me be clear about what I am claiming. When we imagine a zombie case by assigning the crucial facts, that imagining provides no evidence that zombies are possible. There may be other ways to imagine zombies; in particular it may be worth exploring whether zombies are imaginable "from the inside." I think we need to investigate imagining from the inside regardless, to settle whether imagining disembodiment provides evidence that disembodiment is possible. (Disembodiment is the other case Kripke discusses at the end of *Naming and Necessity*. The issue is whether it is possible for you to exist without any material objects existing, i.e., for you to exist disembodied.) The issues surrounding imagining from the first person perspective turn out to be quite complex and require full treatment in their own right. I leave that for another occasion.[37]

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It would not strike us as odd that we imagine impossible situations were it not for the philosophical preoccupation with possibility. We have no problem allowing that one can *believe* a great many necessarily false things (given the diversity of conflicting views in philosophy, a great many philosophers must being doing just that). For some reason, philosophers who want to argue that some surprising things are *necessary* or *possible* are drawn to making very bold claims about our powers of *imagination*. These bold claims seem to me far too strong. Authors and artists use their imaginations to dream up all manner of strange and wonderful things. We imagine these things via assignments. Fortunately we don't need to take

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[36] The last phrase "all dark *inside*" suggests to some authors that imagining one's zombie twin requires imagining *being* a zombie, imagining it *from the first-person*, or *from the inside*; see Hill (1997) and Nagel (1974, n11 and 2002, §v) and Shoemaker (1993). I think this is a mistake: to imagine your zombie twin you do not *have* to imagine it from the inside. In reading a novel and imagining various people interacting, e.g., in imagining the Count Olaf ecstatic, Klaus frightened, and Violet hatching a plan to thwart Olaf, I may picture all three characters in my mind's eye from the outside. I do not have to pop "inside" each person's head to establish that they are conscious creatures, or that they have the emotions or thoughts I imagine them to have. This is all done with assignment. See Kung (2008) for discussion.

[37] See Kung (2008).

these assignment-based imaginings as evidence for possibility.[38]

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[38] Thanks to egad so many people.

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