

Similarity and Possibility: An epistemology of de re possibility for concrete entities

Abstract: The paper sketches an epistemology of *de re* possibility (for concrete entities) centred on the notion of *similarity*. The proposal is, roughly, that we know about some entities' unrealized possibilities by extrapolation from knowledge about some other, similar entities' realized possibilities. The account is limited, among other things, in that it does not cover knowledge of *de re* necessities or essentialist knowledge, *if* we have it. But even if alternative epistemologies could explain that type of knowledge too, the current account is found to best explain the *de re* possibility knowledge, thereby resisting a potential charge of redundancy.

1. Preliminaries: A methodological recommendation

Epistemologies of modality are often classified by means of the rationalist/empiricist dichotomy. As a matter of fact, most of the leading epistemologies of modality are fundamentally rationalist:¹ they are epistemologies that accommodate the phenomenon of *a posteriori* necessities (and impossibilities) by still claiming them to be *fundamentally a priori*.² Although rationalist epistemologies have many advocates, they also have many detractors who, collectively, have put forward forceful arguments against them.³ This dissatisfaction has fostered the search for an empiricist epistemology that the present volume aims to mark.⁴ This paper will offer the sketch of one such epistemology; one designed to cover the case of possibility knowledge about concrete entities.

However, apart from the rationalist/empiricist distinction, there is another one reflection on which will suggest a methodological recommendation that this paper is set to follow. I shall take it as uncontroversial that, roughly, *de re* possibility is a matter of compatibility with essence.⁵

¹ A salient exception here is (Williamson 2007).

² The idea is that *a posteriori* necessities like, perhaps, that Socrates is necessarily human, can be factored out into an essentialist principle—supposedly (purely) *a priori*—, like *all humans are necessarily human*, and an *a posteriori* non-modal truth, like Socrates is human. For more on how a posteriori necessities can be subsumed under a rationalist programme, by claiming them to be fundamentally a priori, see for instance (Peacocke 1999: 168-9).

³ See (Brueckner 2001), (Horvath 2014), (Leech 2011), (Martínez 2012), (Mizrahi & Morrow, 2014), (Roca-Royes 2010), (Roca-Royes 2011a), (Vahid 2006), (Vaidya 2008), (Williamson 2002), (Worley 2003), and (Wright 2002).

⁴ This growing non-rationalist tendency has several instances in the literature. Salient pieces include (though the list is not exhausted by): (Biggs 2011), (Elder 2005), (Fischer 2015, and this volume), (Hanrahan 2009), (Hawke, this volume), (Jenkins 2010), (Leon, this volume), (Nolan, this volume), (Rasmussen 2014), (Strohming, forthcoming), (Tahko, this volume), (Williamson 2007).

⁵ Although I myself have done that in the past (Roca-Royes 2010), it would be naïve to capture this idea with a biconditional along these lines: "For any entity *e* and property *P*, *Possibly-P(e)* iff *P(e)* is compatible with *e*'s essential facts". This is unnecessarily strong. Assume that the laws of nature are necessary. It might still be compatible with all of *e*'s essential facts that *e* inhabits a world with different natural laws. That would then be possible according to the bi-conditional but impossible by assumption. It might also

What is not uncontroversial is whether, when it comes to *de re* modal knowledge, the epistemic priority lies on the side of possibility facts or on the side of essential facts, if anywhere. There are three types of answers to this question: possibility facts are epistemically prior to essential facts; essential facts are epistemically prior; or there is no epistemic priority. This brings us the announced further distinction among epistemologies: possibility-based, essence-based, and neither possibility- nor essence-based.

Although, at bottom, the options are three, the real options are more, given that one can answer the priority-question differently for different sorts of entities; and one can also leave room for (at least partial) epistemic inaccessibility. For instance, one might take it that, no matter what kind of entity *e* is, *de re* modal knowledge about *e* is essence-based. Or one might endorse an epistemology according to which only for concrete entities we would first know *all* possibility facts about them, know somehow that they are all, and then transition from there to knowledge of their essential facts, while endorsing a different answer for abstract entities. Yet another alternative would be to claim that *de re* possibility knowledge and essentialist knowledge (at least for some sort of entities) is independent of one another. The option mentioned last—though the list of options hasn't been exhausted—is, as we shall see, my preferred one. More precisely, I shall motivate that *de re* possibility knowledge is independent of essentialist knowledge and that, *if* we have essentialist knowledge (of concrete entities), this is in turn (largely) independent of possibility knowledge.⁶

This way of distinguishing among *de re* modal epistemologies is akin to Hale's distinction in terms of *symmetric accounts* of modal knowledge, *asymmetric necessity-first*, and *asymmetric possibility-first* (Hale 2003 and 2013). A qualification is needed, however, to the effect that, unlike Hale's notions—which are more general than the current ones—the current notions are to apply to accounts of *de re* modal knowledge only; which is the focus of the present paper.

The methodological recommendation that emerges by reflecting on the issue of epistemic priority is as follows: aim at elucidating the *de re* possibility knowledge that we have about concrete entities in such a way that success here is not parasitic upon success in explaining knowledge of their essential facts. In other words: (at least) when it comes to concrete entities, the recommendation is to avoid an essence-based epistemology.⁷ This recommendation stems from the following theoretical considerations. To begin with, that we have (some) possibility knowledge about concrete entities is much more robust a claim than that we have essentialist knowledge about them. We know that my office wooden table can break; it's not so clear that we know that (whether?) its material origins are essential to it—even less so to which degree, if

be compatible with all of *e*'s essential facts that *e* inhabits a world where the Eiffel Tower is made of wood. This shows that the rough idea must be captured by a somehow weaker statement (e.g., by applying some convenient restriction on the relevant P's; by not restricting the right-hand side of the biconditional to *e*'s essential facts, involving instead all essential facts; or somehow else). For current purposes, the rough idea should suffice.

⁶ The qualification that makes me add 'largely' is this: it would be independent of knowledge of *unrealized de re* possibilities.

⁷ This is the recommendation to avoid theories of modal knowledge that, like Peacocke's (1999) or Hale's (2013) explicitly do, take the ontological priority of essence over modality as suggesting a corresponding epistemological priority too: "According to the essentialist theory, metaphysical necessities have their source in the natures of things, and metaphysical possibilities are those left open by the natures of things. Although the theory does not, in and of itself, say anything about how we may come to know what is metaphysically necessary or possible, it seems to me that it strongly suggests a particular approach to modal knowledge. [...] one might expect an essentialist explanation of modal knowledge to follow a necessity-first approach." (Hale 2013, 253-4)

they are (known to be) essential. The agreement among epistemic peers on ordinary possibility claims in contrast with the disagreement on essential facts (and some corresponding extraordinary possibility facts⁸) is something that social epistemology tells us not to ignore; as such contrast might signal the reliability of our methods as far as ordinary modal claims are concerned and their unreliability beyond them. It is methodologically advisable, therefore, to aim at an epistemology that would allow us to account for our ordinary possibility knowledge without *thereby* committing us to account for (alleged) essentialist knowledge. But that is, precisely, what an essence-based epistemology of the sort characterized above would *not* allow us to do. For, according to an essence-based epistemology, we know that my wooden table can break as a result, roughly, of knowing the table's essential properties and knowing also that they don't preclude the table from breaking. This being so, such an epistemology will not have fully-and-satisfactorily elucidated possibility knowledge until it has satisfactorily elucidated essentialist knowledge. I do not mean to suggest that essentialist knowledge cannot be satisfactorily elucidated.⁹ I shall offer two reasons that advise against this strategy, though. First, given the epistemic asymmetry noted above between ordinary possibility facts and essential facts, implementing such strategy would amount to explaining what is uncontroversially in need of an explanation—because ordinary possibility knowledge *is* uncontroversially a phenomenon—by having explained what might not need an explanation—because essentialist knowledge (about concrete entities) might not, after all, be a phenomenon. Second, the plausibility of the explanation of *de re* possibility knowledge such an account could offer would be upper-bounded by the plausibility of the explanation it offers of essentialist knowledge. I think, however, that we are in a position to explain our *de re* possibility knowledge much more persuasively than we are in a position to explain essentialist knowledge (if we have such knowledge). For these reasons, an essence-based strategy seems to me to be methodologically very unattractive.

In addition to these theoretical considerations, in past research I have offered arguments to doubt the satisfactoriness of dominant epistemologies of modality one finds in the literature that, if correct, constitute grounds for historico-inductively strengthening the methodological recommendation. This is not the place for me to offer a reconstruction of those arguments; whose details are specific to the target epistemology at issue in each case.¹⁰ What is, for current purposes, salient of them is their convergence in the following diagnosis (only crudely stated here): at some level—some times more explicitly than others—they all rely on a capacity for essentialist knowledge—arguably an exercised one—in their elucidations of possibility knowledge. Moreover, such capacity for essentialist knowledge is left unsatisfactorily explained, and this compromises (the satisfactoriness of) the elucidations they provide of our ordinary possibility knowledge. If those diagnoses are based on fair criticisms, we have also inductive

⁸ Disagreement as to whether Gandhi is *essentially* human easily translates into disagreement as to whether he *could* be, for instance, a cat.

⁹ Hale's (2013), for instance, is a nice attempt at elucidating essentialist knowledge—to me, with a reductionist flavour—much in need of serious scrutiny. A different issue is whether success in elucidating essentialist knowledge could help the project of defending an essence-based epistemology; I offer reasons for pessimism in §5.

¹⁰ The arguments are in (Roca-Royes 2010, 2011a, 2011b and 2012).

reasons of estimable strength to believe in the poor prospects of essence-based epistemologies (of *de re* modality).¹¹

As anticipated above, I shall sketch an epistemology of *de re* possibility knowledge about concrete entities that can be described as empiricist. Yet, the paper is not so much a reaction to my dissatisfaction with rationalist proposals *per se* as it is a reaction to both the theoretical and the historico-inductive considerations in favour of the methodological recommendation.¹² The paper's position is that, when it comes to concrete entities, we have possibility knowledge that is, and can be satisfactorily explained as, independent of antecedent essentialist knowledge. Throughout the paper, I shall remain silent about the case of abstract entities, as I believe that an epistemology of modality for *abstracta* requires a different treatment altogether.

The plan for the rest of paper is as follows. Section 2 sketches, and motivates the adequacy of, the non-rationalist epistemology on offer. As it will be clear, similarity plays a central role in the account. The next two sections offer some clarifications by focusing, first, on the notion of relevant similarity (§3) and, then, by identifying some important limitations of the account that in turn provide some insights on irrelevant similarities (§4). The limitations have to do, saliently, with the long-controversial essentialist theses. In §5, I offer—by way of concluding remarks—some reasons to think that, even if there were alternative epistemologies capable of accounting for essentialist knowledge *too* (thereby being potentially thought as explanatorily more powerful), the current proposal would still not be redundant.

2. The sketch

Following the recommendation above, the present sketch starts by aiming to elucidate the knowability conditions of (uncontroversially) *accessible, basic (de re)* modal facts. These are modal facts such as, for instance, those expressed by (i)-(iv):

- (i) It is possible that the wooden table in my office breaks
- (ii) It is possible that John Kennedy dies of a heart attack
- (iii) It is possible that Gandhi is born on 1/10/1869
- (iv) It is possible that Obama is born in Washington

In calling these modal facts 'basic', I am following Divers' terminology: claims (i)-(iv) are all instances of what Divers calls 'basic modalizing'; that is, modalizing that is about spatio-temporally located and spatio-temporally unified entities. (Modalizing is *advanced* otherwise.) Yet, not all basic modal facts are uncontroversially knowable. I am working under the hypothesis—and suspicion—that van Inwagen's distinction between *everyday* and *remote*

¹¹ These grounds exclude more recent accounts of pieces of essentialist knowledge like Hale's (2013) and Bigg's (2011). Were we, after adequate examination, to be in a position to draw analogous conclusions, the grounds would be strengthened. I cannot offer a treatment of their views here and, as a result, I shall only rely on the moderate grounds mentioned in the main text. Something that can be noted briefly, however, is the following: even if accounts like (Hale 2013) and (Biggs 2011) were successful in explaining the essentialist knowledge they focus on—i.e., even if successful as far as their running examples are concerned—, for their accounts to serve an essence-based strategy, their explanations would need to be sufficiently generalizable so as to support at least a moderate necessity-first account. ('Moderate' in the sense of Hale (2013, 253).) That is a necessary condition that remains to be seen met. But even if it was met, I do not think it is sufficient. In the concluding remarks (§5), I briefly explain why an essence-based epistemology is unlikely to be correct irrespective of the success of an explanation of essentialist knowledge.

¹² For it is also in part a reaction to my dissatisfaction with accounts which, like Williamson's, resist the label 'rationalist' while not, after scrutiny, that of 'essence-based'.

modal facts—which cuts across Divers' distinction between *basic* and *advanced*—is, as motivated in the introduction, tracking a real phenomenon.¹³ As such, the plan is to start with the uncontroversially accessible basic (*de re*) modal facts and see how far we can get.

The naïve starting point of the present sketch is reflected in what follows:

I know that the wooden table in my office, Messy, is not broken. How do I know that?
I see it. Although not broken, Messy can break. How do I know that? Because the table I had before Messy, which we may call 'Twin-Messy', was a twin-sister of Messy, and it broke; and I know that Twin-Messy broke because I saw it.

I contend that the naïve reasoning offered as an answer to the knowability of Messy's breakability is epistemically satisfactory. I believe that, roughly, *this is how* we form informed judgements about unrealized possibilities that are both accessible and basic. But beyond this empirical, psychological claim (which I shall not defend), I believe, more importantly, that such route to modal judgement is knowledge-conferring. The efforts here will be put on defending this latter claim.

A look at the naïve starting point reveals several elements that will, expectedly, be involved in our elucidations of the knowability conditions of accessible, basic modal facts. First, it is assumed that perception gives us epistemic access to non-modal facts about spatio-temporally located entities:¹⁴ I know that Messy is not broken because I see it; and that Twin-Messy broke because I saw it. Second, there is an *epistemic* version of a counterpart relation involved, of which I should stress its epistemic nature: it is not that Messy's possibility of breaking is to be analysed as the fact that Twin-Messy broke; it is, rather, that what happens to Twin-Messy *informs us* about what could happen to Messy. Third, (epistemic) counterparts of actual entities may be found in the actual world: Messy and Twin-Messy are both counterparts and actual-world mates; so among the spatio-temporally located entities we have perceptual access to, there are epistemic counterparts. Fourth, any two entities that stand in the counterpart relation do so in virtue of being similar in some relevant respect: Messy and Twin-Messy are said to be, for instance, intrinsically very similar.

By means of illustrations, and exploiting these elements, I shall next offer elucidations of the knowability of claims (i)-(iv) that I take to be essentially correct. I shall proceed in two steps: first (in §2.1), I will offer the bold answers while also identifying their epistemic assumptions. After that (in §§2.2-3), I shall focus on those assumptions to motivate the claim that they don't threaten the satisfactoriness of the explanations.

2.1. How can we know? The bold answers

How, then, can we know that Messy can break? Here is an answer to how one such piece of knowledge can be epistemically grounded. The answer is conditionalized upon a series of *if's* to which I will come back, as announced, in §§2.2-3:

(A.i) *If* we know, as suggested by the naïve reasoning above, that some other wooden table very much like Messy, *a*, has broken, and *if* we know that

¹³ This does not commit me to agreeing with van Inwagen on where the dividing line lies. I actually think that we have not been told enough, in his foundational 'Modal Epistemology' (1998), about what van Inwagen thinks on the matter, but this is no impediment to recognizing that the distinction is an important one and the phenomenon being tracked likely a real one.

¹⁴ To qualify: About spatio-temporally located entities that are also spatio-temporally unified and spatio-temporally related to us.

actuality implies possibility—that is, if we know that $p \rightarrow \Diamond p$ —we can warrantably transition to:

It is possible that a breaks

If, in addition, we know that objects similarly made out of the same sort of materials are susceptible to similar effects, and if we know that Messy is similarly made out of the same sort of material as a was made of, we can warrantably transition to:

It is possible that Messy breaks.

We can extract from this answer a pattern that will be present, at some point or other in the explanations below, in the other illustrative cases (ii)-(iv). The pattern is to get knowledge of a (known-to-be-)realized possibility for a given object a — $\Diamond\varphi(a)$ —and then extrapolate to another entity, b —obtaining knowledge of $\Diamond\varphi(b)$ —irrespective of knowledge as to whether b has actualized that possibility or not.

We could think of the process of acquiring (*de re*) possibility knowledge as the task of revealing the presence of entities in the class determined by an open modal formula, $\Diamond\varphi(x)$, appropriately interpreted. In the case of (i), the relevant open formula (in a hybrid language) is ' $\Diamond x$ breaks'. This open formula determines a given class: the class of entities that are modally on a par as far as breakability is concerned. Knowledge, of an entity, that it belongs to this class is *de re* modal knowledge that it *can* break. The first part of (A.i) above explains how we can know of a (or of Twin-Messy) that they belong to the class. The second part of (A.i) tells us, more interestingly, how Messy, which has not (perhaps yet) actualized its possibility of breaking, can also be revealed to belong to that class. It is here—in the second part of (A.i)—where the most interesting action happens. Before turning to the issue whether the *if*'s in (A.i) threaten the satisfactoriness of the explanations, let me make explicit the (at-bottom-)analogous answers in the other three illustrative cases.

In the case of (ii)—*it is possible that Kennedy dies of a heart attack*—the answer is essentially the same as in the case of (i):

(A.ii) If we know that some hearted animal (if you want: human), a , has died of a heart attack, and if we know that actuality implies possibility—that is, if we know that $p \rightarrow \Diamond p$ —we can warrantably transition to:

It is possible that a dies of a heart attack

If, in addition, we know that, given their similarity in intrinsic character, all (human) hearts are alike in causal powers, then we are in a position to know that all hearted animals (if you want: humans) are alike in heart-effect susceptibility. If we know that Kennedy is[was] a hearted animal (if you want: a human being), we can warrantably transition to:

It is possible that Kennedy dies of a heart attack.

Here, the corresponding open modal formula is ' $\Diamond x$ dies of a heart attack', and the first part of (A.ii) explains how we can know of any actual entity that has actualized her possibility of dying of a heart attack that it belongs to the class that it determines. More interestingly, the second part of (A.ii) explains how we can know, of at least some other entities—those which are known to be actually hearted animals (or humans)—, that they belong to that class too when they have not (or are not known to have) actualized the possibility of dying of a heart attack. In the case of

Kennedy, that possibility is even known to have *expired* for him,¹⁵ but that does not undermine (A.ii) as an answer to how we know that Kennedy belongs to the class determined by ' $\diamond x$ dies of a heart attack'.

The cases of (iii) and (iv) are less straightforward than (i) and (ii) but, at bottom, the extrapolation pattern identified above will be present here too. Take (iii)—*it is possible that Gandhi is born on 1/10/1869*. We know that he was actually born on the 2nd of October. How can we know that he could have been born one day earlier? Here's how a grounding story could go. Suppose we know, of some human being, *a*, that *a*'s mother's pregnancy when carrying *a* lasted less (if you want: exactly one day less) than Gandhi's mother's pregnancy when carrying Gandhi. From here, with appropriate extrapolation, we would be in a position to know that Gandhi's mother's pregnancy when carrying Gandhi could have lasted less (if you want: exactly one day less) than it did. And from here, we would get Gandhi's possibility of having been born on the 1st of October. (Not that the grounding story *must* go this way. But this is one way—among perhaps several equally-empirical ways—the story could go. Analogous remarks apply in the other illustrative cases.)

In a similar vein, we know that Obama was born in Honolulu, but we also know that, as stated in (iv), he could have been born in Washington. One way the grounding story could go in this case is by taking such piece of modal knowledge as (partially) derivative of knowledge that Obama's mother could have been in Washington around the 4/08/1961, which is when Obama was born. Again, appropriate extrapolation—based, for instance, on the fact that extended bodies are movable—will be involved in grounding the piece of modal knowledge about Obama's mother's possible locations (around Obama's birth time).

2.2. The role and nature of the *if*'s.

As illustrated by means of (i)-(iv), what the current proposal suggests as epistemic grounds for the pieces of *de re* possibility knowledge that we have involves antecedently possessed other sorts of knowledge: the grounds involve antecedent knowledge that from actuality one can move to possibility; they rely also on categorical knowledge (by which I mean knowledge that is neither nomic nor modal); and they rely too on nomic-like knowledge. These are the *if*'s to which I am now coming back. To anticipate: I believe that the epistemic adequacy of the explanations above is not threatened by those *if*'s. Let us first be clear about the role of the *if*'s and what exactly they amount to, and then offer reasons, in §2.3, why the sort of modal epistemology suggested is not jeopardized by them.

The case of $p \rightarrow \diamond p$. This principle allows us to get knowledge of possibilities so long as the possibilities have been realized. I believe that when the modality involved in this principle is *alethic*, this principle is close to being a conceptual truth, if not a conceptual truth proper. It is a defining feature of alethic modalities that whatever happens is a possibility (in the first instance). Perhaps something (else?) must eventually be said as to how we know that much, and our epistemology of conceptual truths might prove helpful to this effect. I shall not focus on this in §2.3, however, because I find it more urgent (and arguably more challenging) to address

¹⁵ The notion of *expired possibility* is to be understood as capturing metaphysical possibilities whose actualization has been ruled out by the actualization of *another* possibility metaphysically impossible with the first. For instance, John Kennedy's possibility of dying of a heart attack *expired* the moment he died shot. This is not to say that dying of a heart attack *ceases to being a possibility* for Kennedy; it remains true that Kennedy could die (have died) of a heart attack.

those *if*'s that, by means of ampliative methodology, provide epistemic grounds for *unrealized* possibilities.¹⁶

The case of categorical knowledge. Categorical knowledge provides partial epistemic grounds for unrealized possibilities. Knowledge that Twin-Messy broke partially grounds our knowledge that Messy can break. In perhaps the simplest cases—like in the naïve reasoning above—the categorical knowledge appealed to will be perceptual knowledge; as when I know that Twin-Messy broke because I saw it. But categorical knowledge can be more complexly grounded than this. In other cases, it might still be (indirectly) perceptually grounded but already combined with testimony; as when you know that Twin-Messy broke because I told you. In more complex cases, categorical knowledge is delivered by a team of epistemic tools including memory, induction, testimony, abduction, or entitlements of some sort; as illustrated by our knowledge of quarks, hands, the blackness of ravens, etc. Categorical knowledge can, therefore, be very complexly grounded. And because any piece of categorical knowledge is (expectedly) eligible to figure in the epistemic grounds for some piece of modal knowledge, something must be said about the epistemic adequacy of ampliative methodology in order to have offered a full epistemology of modality.

The case of nomic-like knowledge. What is doing the major work in the explanations above are pieces of nomic knowledge. What allows us to transition to the pieces of *de re* possibility knowledge (of unrealized possibilities) is, at bottom, the idea that causal *powers* and effect *susceptibility* depend on qualitative character. In other words, reliance on the uniformity of nature is distinctively salient. The second part of (A.i), for instance, relies on a principle according to which, if an entity, *x*, is similar (in certain respects) to the way *a* was at some point, then *x* can break. Similarly, the second part of (A.ii) relies on a principle according to which if an entity has heart, it can die of a heart attack. Generalizing from these examples, our grounds for (*de re*) possibility knowledge involves, at some point or other, a principle of the form:

$$\varphi(x) \rightarrow \Diamond\psi(x)$$

Given any (non-vacuously) true instance of a given such principle, what would ground, epistemically, our transition to its consequent would be knowledge of its antecedent (a piece of categorical knowledge), *together with* knowledge of the principle it is an instance of. It is, for instance, nomic knowledge that *hearted animals can die of a heart attack* and that *Kennedy has a heart* that allows us to transition to his possibility of dying of a heart attack. And it is knowledge of Messy's current intrinsic features that, together with a principle according to which entities with those features can break, allows us to transition to its possibility of breaking. We have seen above that categorical knowledge is arrived at by means of a battery of ampliative methods. The same is true of the principles themselves, with induction having here a salient role. The principles are grounded in knowledge that, for some *a*, $\varphi(a)$ and $\Diamond\psi(a)$ (given that $\psi(a)$), plus *reliance* on the uniformity of nature. In other words, and as is already present in the naïve reasoning we started this section with, the suggestion is that what (is known to have) happened to certain entities—which thereby come to play the role of epistemic counterparts—*informs us*,

¹⁶ I believe that the case should be treated the same whether the diamond there is interpreted as nomic or as metaphysical necessity. So I am *not* suggesting that we go from actuality to nomic possibility and from here to metaphysical possibility. (For reasons I cannot extend on here, I believe that route is faulty.) Rather, we go from actuality directly to metaphysical possibility (or any other alethic modality). We have, at bottom, a family of principles of the same form. I'm grateful to Margot Strohminger and Barbara Vetter for pressing me on this.

together with reliance on the uniformity of nature, of what could happen to other, similar entities. Ampliative methods of potentially all sorts will be involved, depending on the cases, in grounding the categorical knowledge of the epistemic counterparts that then inductively grounds the principles. What is common in all such principles will be the reliance on the uniformity of nature; in other words, the reliance on induction.

2.3. Are the explanations satisfactory?

Despite the different roles that nomic and categorical knowledge play in the acquisition of *de re* possibility knowledge, knowledge of both sorts is involved in grounding such modal knowledge. In addition, the epistemic tools capable of delivering categorical and nomic knowledge are not significantly different: both sorts of knowledge are arrived at with the indispensable assistance of a varied array of ampliative methods. As such, the task of answering the question whether the explanations above are satisfactory is a huge one: so huge as to include, roughly, any effort that has been and is being made under the label of ‘epistemology’. No complete and fully satisfactory answer to the epistemic challenge that ampliative methodology raises can fit in a subsection of a paper. Nor am I dreaming of writing—or being in a position to write—a satisfactory answer anywhere else. The most reasonable attitude is (arguably) to rely on the benefits of division of labour. There are, however, some remarks that can be made to alleviate certain immediate concerns and that can help us draw an agenda for future research. These remarks should be sufficient for current purposes.

The first comment is a defensive “*we’re not alone*” sort of reaction that should provide some comfort to modal epistemologists. When ‘metaphysical modality’ is taken as restricted to *de (material) re metaphysical possibility*, I could not agree more with Williamson when he tells us that

The epistemology of metaphysical modality requires no dedicated faculty of intuition. It is simply a special case of the epistemology of [...] a kind of thinking tightly integrated with our thinking about the spatio-temporal world. To deny that such thinking ever yields knowledge is to fall into an extravagant skepticism. (Williamson 2007, 178)¹⁷

It is well known that the use of ampliative methodology is ubiquitous. Memory is salient in allowing us to transcend the present towards the past; testimony, in allowing us to transcend the witnessed; induction and abduction, in allowing us to transcend the observed and the observable; etc. To note that we are in company here does, admittedly, nothing to start addressing the epistemic challenge that our uses of such methodology raise, but it is nonetheless important to note that the challenge of the sort of epistemology suggested above would be wrongly, and indeed unfairly, characterized if directed against *it* only. When the problem of knowledge of unrealized possibilities is properly understood as a special case of a more general epistemological problem, it is only to be expected that the solution in the modal case will not be independent of—and will indeed be likely subsumed by—a more general solution. It is in finding this general solution that the efforts should be put.

The second comment is on the sort of efforts that I find particularly promising to alleviate certain sceptical worries about inductive (and abductive) methodology. On the epistemology

¹⁷ The ‘[...]’ in this quotation omits Williamson’s reference to counterfactual reasoning. I am doing so because I do not think that the epistemology of modality is to be subsumed under the epistemology of counterfactuals. (Roca-Royes 2011b and 2012). I do agree with the quoted content (so-manipulated).

suggested, all sorts of ampliative methods might figure in our grounds for *de re* possibility knowledge and, because of that, the (huge) dimension of the task of answering the title-question of this subsection has been appropriately acknowledged. Among the ampliative methods, however, induction—and our reliance on the uniformity of nature—has been identified as playing a salient role. I am of the view that this salience need not translate into the task of legitimizing induction as being more important—vis-à-vis the task of completing an epistemology of *de re* modality for *concreta*—than the task of legitimizing other ampliative methods. Yet, it can only be reasonable to prioritize addressing induction on the basis of such salience. There is a sceptical challenge that I find particularly urgent to address. This is not the worry that we might never know the deliveries of induction—I take it that we *do* know them (in the good cases)—but rather that we might not be in a position to warrantably (self-)attribute any such knowledge. It is, in short, the sceptical challenge that Wright’s paper on warrant for nothing is partly about (Wright 2004). As noted and summarized by W.C. Salmon in 1953, the problem of induction has long been generating literature:

There are three possible ways in which the doctrine of the uniformity of nature might be incorporated into a philosophical system. First, it might be regarded as an empirically established truth. John Stuart Mill is the outstanding historical proponent of this view. Second, it might be regarded as a truth which is established a priori. Kant, of course, maintains this position. Third, it might be held to be a postulate of knowledge, impossible to establish as true, but necessary to assume in order that inferences may be made. John Venn is one of the chief historical advocates of this view. [...]

The third view, that the uniformity of nature is to be assumed as a postulate, is the view which is perhaps most deserving of present-day attention. (Salmon, 1953)

This being (still) the scenario, we should be looking very seriously at Wright’s suggestion that entitlements—and, in particular, *entitlement of rational deliberation*—might provide the sort of epistemic foundation we’re in need of. According to Wright,

By the proposed notion of entitlement, we are [...] in position rationally to accept that nature displays sufficiently many inductively/abductively ascertainable regularities to make the prosecution of those methods worthwhile. But that is enough to ensure the rationality of employing those methods. (Wright 2004, 199)

The conclusion is that we are in a position to warrantably attribute knowledge of the uniformity of nature, although such warrantability comes, not from evidence, but from entitlements. My working hypothesis is that a sceptical solution in terms of *entitlement of rational deliberation* is, not just the best we can do, but all we need. Scrutinizing this hypothesis is hereby identified as a task for future research. So it is the task of exploring how, if at all, some type of entitlement could assist us when it comes to ampliative methods other than (a posteriori) inductions/abductions.

The third, and final, comment is on what can be said in favour of the epistemic adequacy of specific *uses* of ampliative methodology when general sceptical worries about them are set aside. I believe the adequacy of some uses to be testable. Certainly the *theses* that some such uses deliver are testable. Take the claim that Messy is breakable or, more generally, the claim that wooden tables are breakable. We can test them by attempting to break Messy, or some other table or tables. If we succeed in breaking Messy, there’s no doubt that Messy can break. If

we succeed in a large enough ratio of cases, this reinforces our belief that wooden tables can break. But it is not just the beliefs in the delivered *theses* that should be reinforced. By the same token, the epistemic adequacy of the methodology that was involved in generating them should be too. When the adequacy of ampliative methodology is not under general sceptical doubt, and when a particular use is in line with other (equally well-tested) particular uses, the good results are *best explained* by the adequacy of the methods so applied: we are getting at the truth *because* the way we are using the methodology is, in the given contexts, truth-conducive.

Although a lot more work needs to be done to fully answer the title-question of this subsection, the brief remarks offered here should be enough both for current purposes and to justify optimism that a fully and satisfactory answer is forthcoming.

3. Clarifications: Relevant similarity

The illustrative cases (i)-(iv) above are admittedly very simple. I intend them however to be sufficient to motivate, by generalization, the following answer to the general question about our epistemic access to unrealized possibilities: “we know about some entities’ unrealized possibilities by extrapolation from knowledge about some other, similar entities’ realized possibilities”.

There are some things that this general answer cannot do for us, but should not be expected to do either. This general answer does not (and cannot) provide all particular explanations about our *de re* possibility knowledge there are to be had; that is, it falls short of providing answers to all particular ‘how do we know’ questions. Particular explanations are rather to be achieved on a case-by-case basis, and it is not the aim of this paper to embark in such an open-ended task. (A similarly general answer, within the epistemology of mathematics, that we know mathematical truths by proving them will not give us all particular explanations there are to be had either and, yet, it can be motivated by means of analogously simple illustrations.) The general answer will not give us either an answer to *which* are the *de re* possibilities of any given entity. But this should not be expected either. An answer to the which-question falls under *modal metaphysics* more than under *modal epistemology*. (Similarly, which are the mathematical truths is something for mathematicians to tell us; not for the epistemologists of mathematics.)

Yet, the simplicity of the cases, as well as their limited number, calls for some clarifications before we can reasonably be persuaded by the general answer. It is urgent, and uneschewable, to say something about the notion of similarity at play, as well as the epistemic grounds for our judgements of similarity. To a first approximation—to be refined below—the similarity at issue is similarity in categorical intrinsic character. Let us assume that Messy and Twin-Messy are different tokens of the same model of an IKEA table. If our judgement that they are relevantly similar is based on their being (quasi) intrinsic duplicates, our judgement is well-grounded (and as safe as it can get). But how different from Twin-Messy can an entity be before our judgement of relevant similarity to it becomes ungrounded? Is a wooden *bench* structurally identical to Twin-Messy (though at a smaller scale) and made of the same type of wood as Twin-Messy similar enough to it? Is a *one-piece cast iron* table similar enough to Twin-Messy to base our judgement that it can break on the fact that Twin-Messy broke? I submit that the answers are ‘yes’ (or likely so) in the case of the bench and ‘no’ in the case of the cast iron table. Our knowledge that such a robust table can break must have other grounds; for instance, on having seen (or been told about) cases of naturally cracked and then broken cast iron due to huge waves of hot and cold temperatures, or on having performed (or been told about the results of) resistance tests of cast iron things.

How much, then, can we stretch the notion of relevant similarity? That is, how large an extension can we take it to have (in relation to a given modal property; e.g., breakability)? Take a principle of the form $\varphi(x) \rightarrow \Diamond\psi(x)$. As mentioned in §2.2, such principles are partially grounded in knowledge that some entities are (have been) both φ and ψ (and $\Diamond\psi$). These entities play the role of epistemic counterparts of other entities that are similar to their counterparts in that they are also φ , but dissimilar in that they are not (known to be) ψ . The question of how much we can stretch similarity can also be put in terms of how *determinate* the φ 's that figure in the principles that we use to transition to *de re* possibility knowledge must be. Let me explain. Let us assume that Twin-Messy is a pine-wood entity with matter arranged table-wise, relatively thin legs and top, and assembled together with fairly strong glue but no screw. Let us assume that this entity also satisfies enough (further) conditions for it to fall under our concept *table*. Twin-Messy is(was) then one of those not built to last pine-wood tables. We can escalate from here to describe Twin-Messy by means of less and less determinate properties: it is also a pine-wood table, a wooden table, a rather weak pine-wood piece of furniture, a pine-wood piece of furniture, a wooden piece of furniture, a table, a piece of furniture, etc. All these are properties which Twin-Messy instantiated before breaking. Which is better suited to play the epistemic role φ is supposed to play in the (so-callable) *grounding principles*? Can φ be just the property of being a wooden table? Must it perhaps be more specific than that? The short answer is that it *must* be more specific and it *can* be even less. Unpacking this short answer will reveal it free of contradiction. On the current account, our epistemic access to not (known to be) realized possibilities of some entities depends very strongly upon our knowledge that other entities have realized those possibilities. Given this, it is only to be expected that the extent to which the notion of similarity can be stretched, in relation to a given possibility, $\Diamond\psi$, will depend on how varied the several cases of realized ψ -possibilities we know of are. I take it that, when a given principle, with a given ψ in its consequent, is grounded in just one case, epistemic responsibility requires φ (in its antecedent) to be very determinate; this grounds the *must-be-more*-part of the short answer. But this epistemic requirement is not *per se* an impediment to our having grounds for *grounding principles* with the same ψ in their consequents and less determinate φ 's in their antecedents. The more cases of realized ψ 's we know of, and the more varied they are among them, the more principles will be grounded, all with as-determinate-as-can-be φ 's in their antecedents. A big enough family of related principles with the same ψ in their consequents might support (perhaps to an inexactly determinable extent) a generalization with a fairly determinable property in its antecedent. That is—I am inclined to think—how the general principle that *tables* can break is known; and, even more generally, how we know that *material entities* can break. It is not just Twin-Messy that we have seen broken; we have seen broken tables and entities of all sorts. This grounds the *can-be-even-less*-part of the short answer. There is, therefore, no theoretical, *absolute* answer to how much we can stretch similarity with respect to the open modal formula '*x can break*'; not, at any rate, beyond that that it depends very strongly on how varied our experiences of broken entities is. This is exactly the sort of answer that should be expected from a non-rationalist epistemology like the one I am suggesting.

This answer has in its favour a certain corroboration: it *predicts* a phenomenon *we are familiar with*; namely, it predicts, as it happens, that our degree of confidence in our (informed) modal judgements is higher (to an inexact extent) the less distant from the experienced cases its content is. This, I believe, is the phenomenon that van Inwagen's *everyday/remote* distinction is tracking. I know that Gandhi could have been born on the 1st of October 1869, but could he have been born in 1389? I know that some animal embryos develop to being naturally purple

animals. But could the actually existing cows have been naturally purple? I believe that our current state of empirical knowledge does not allow us to confidently answer these questions. Unlike van Inwagen—who thinks that there aren't alternative grounds (van Inwagen 1998: 76)—however, I am not in a position to rule out the existence of different grounds for those (perhaps-)possibilities. Yet, if—as I believe—the lower degree of confidence in them is a real phenomenon, whatever alternative grounds for them might there be, these will have less persuasive force than the inductive grounds submitted above for our running examples (i)-(iv).

To have focused on the breakability of material entities (or on hearts and heart-attacks) is due to the methodological recommendation to start with simple cases which I am following. When we try to generalize beyond those cases we might soon realize—pushing us somehow away from the first approximation above—that similarity in intrinsic character will not always be the (only) relevant sort of similarity. Psychological law-like knowledge that humans tend to like works of art by artists whose previous works of art we liked might figure, for instance, in our epistemic grounds for the claim that the next Quentin Tarantino film *can easily* be a success, irrespective of how much, beyond *authorship*, it resembles his previous films. A lot remains to be done; a lot *more* remains to be done than has been accomplished here. The hope of the project is that we can nonetheless generalize beyond the simple cases to cover more complex cases in saliently analogous ways. The expectation is that this will require us to say more about the relevant respects of similarity. Although it would not be reasonable to embark in the open-ended task alluded to above, *some* more cases, admittedly, need to be explored before we can confidently generalize and before we come to understand better the type (or types) of similarity relevant for the epistemic counterpart relation. I identify also this as a task for future research. For current purposes, I find it more urgent to explore whether we are in a position to say something about respects of similarity that are *not* relevant. This is what we now turn to. In so doing, it will emerge that whether similarity with respect to a given property φ is relevant or not will depend on the *de re* possibility at issue; that is, on the property that plays the role of ψ at any given occasion.

4. Limitations and further clarifications: Irrelevant Similarities

Here is a pair of reasonings that I find epistemically satisfactory:

I could be involved in a car accident. My human neighbour was involved in one (as well as so many other humans, irrespective of how cautious drivers they are in general) and I am not different from him (them) in any relevant sense; we're both (all) humans.

The baby my neighbour is expecting can live on just maternal milk for a relatively long period. My sister did it, your cat did it, my boss's dog did it, just to provide some examples, and the expected baby is not different from any of you in any relevant respect; you're all mammals.

And here are a couple of reasonings that I find epistemically defective:

Malala could have had my (human) neighbour's origins (or anyone else's origins). My neighbour had those origins and Malala is not different from him in any relevant sense; they are both humans.

Gandhi could be a cat. There are plenty of them, and Gandhi is not different from any of them in any relevant respect; they are all mammals.

That I find the latter two reasonings defective is a reflection of the fact that I think that the current knowability model could help us elucidate the knowability conditions of neither of the following two claims; if they are/were true:

- (v) Malala could have had my neighbour's origins
- (vi) Gandhi could be a cat

It would be instructive, therefore, to be in a position to explain *why* the method would be so limited, even in the hypothetical scenario that (v) and (vi) were true and known. So let us try to see whether we can find a symmetry-breaker; that is: something that explains the defectiveness of the reasonings in the second pair while leaving the first two in good standing.

In the cases (i)-(iv), the nomic knowledge appealed to reduces to knowledge that causal powers and effect susceptibility depend on qualitative character. In other cases, as suspected in §3, the regularities might be grounded in law-like psychological knowledge—for instance, that if a film by Quentin Tarantino is released, it can easily become a success. Despite their differences, all the (non-defective) examples above suggest that the principles that allow us to transition to *de re* possibility knowledge are all of the form we're already familiar with: $\varphi(x) \rightarrow \Diamond\psi(x)$. After exploration, a temporal order seems to be revealed as common too: as suggested by the examples, for any *a*, the *actualization* of $\Diamond\psi(a)$ —that is, the fact that $\psi(a)$ —is (or would be, in cases where the possibility has not been actualized) temporally posterior to (the beginning of) $\varphi(a)$.¹⁸ This temporal order between $\varphi(a)$ and $\psi(a)$ correlates, in the current account, with an *epistemic* priority order too. Taking both orders into consideration, this is what we arrive at: in cases where *b* has not realized the possibility of ψ -ing, it is *antecedent* knowledge of $\varphi(b)$ which (partially) grounds our knowledge that *b* can *subsequently* be ψ .¹⁹ Going back to the examples: Kennedy is known to be able of dying of a heart attack on the basis of being *antecedently* known to be a hearted animal *in the first place*; Messi is known to be able to break on the basis of being *antecedently* known to have certain intrinsic character *in advance*; Obama's mother is known to be movable on the basis of being *antecedently* known to be an extended body *to begin with*; and we know that the next Tarantino film can easily *become* a success on the basis of *antecedent* knowledge of its authorship.

I shall use '*qualitative anchor*' to describe those φ 's (appearing in true grounding principles) capable of playing the epistemic role of allowing us to (groundedly) transition to a given *de re* possibility. As we shall next unfold, it is the lack of a suitable qualitative anchor that explains the sterility of the current knowability model when it comes to (v) and (vi); this absence is our sought symmetry-breaker.

The case of (v). Let '*a*' be a name for Malala and let '*b*' and '*c*' be names, respectively, for the sperm and egg cell from which my neighbour originated. In the case of (v) we would need a principle akin to " $\varphi(x) \rightarrow \Diamond O(xyz)$ "—where ' $O(xyz)$ ' is interpreted as *x originates from sperm y and egg cell z*—which somehow, together with knowledge of $\varphi(a)$, enabled us to transition to

¹⁸ I am adding 'the beginning of' because the φ -facts will (typically) be themselves temporally extended facts and might on occasions overlap with $\psi(a)$ at a later stage.

¹⁹ It is to be expected that, more often than not, the possibility of ψ -ing will be epistemically accessible by means of two or more different principles involving (slightly?) different φ 's in their antecedents. (For instance, as motivated in §3, the different principles might involve a more and a less determinate property.) This does not conflict with the existence of an epistemic priority of the sort described above, but it requires me to refine/qualify the claim as follows: there must be *some* φ_i such that knowledge that $\varphi_i(x)$ grounds the transition to the possibility knowledge.

$\Diamond O(abc)$.²⁰ But no property could play the role of φ in this case; that is, no property could be the qualitative anchor of one such principle. The problem with the possibility in (v) is that, in searching for a potential qualitative anchor, we would need to go so far back in time that we would lose Malala altogether and, with her, we would lose also any qualitative character she's ever had. There is—and there could be—no φ such that, in virtue of knowing Malala to be (or have been) φ she can be known to be able to *subsequently* originate from b and c (or, for that matter, any other y and z). Nomic knowledge—or, at any rate, the sort of nomic knowledge we've been appealing to above—allows us to reach fairly far, but not so far so as to reveal the presence of the pair $\langle a, \langle b, c \rangle \rangle$ in the class determined by the open modal formula ' x originates from y and z '.²¹ It allows us, for instance, to know that, for any (healthy) sperm, s , there are pairs in that class which look like this: $\langle x, \langle s, z \rangle \rangle$. It allows us to know this because we know that *(healthy) sperms can (eventually) figure in the origins of some entity*. It allows us to know too, for analogous reasons, that, for any (healthy) egg cell, e , there are pairs which look like this: $\langle x, \langle y, e \rangle \rangle$. I believe it also allows us to know that, for any (healthy) human sperm s and any (healthy) human egg cell e , there are pairs looking like this: $\langle x, \langle s, e \rangle \rangle$.²² Even if my neighbour did not exist, therefore, we would have grounds for the claim that there is a pair looking like this in the class: $\langle x, \langle b, c \rangle \rangle$. In addition, the principle $p \rightarrow \Diamond p$ allows us to know that there is also a pair that involves Malala as an originated entity: $\langle a, \langle y, z \rangle \rangle$. (Importantly: it is *not* nomic knowledge that allows us to know this.) None of these pieces of knowledge, however, is sufficient to warrant our belief that $\langle a, \langle b, c \rangle \rangle$ belongs to the class. If, without any further reason, we claimed it to belong to the class, we would be displaying epistemic irresponsibility and likely begging the question against the thesis of essentiality of origins. But also, if, without any further reason, we claimed it *not* to belong to the class, we would be displaying epistemic irresponsibility too and likely begging the question (with appropriate generalization beyond the case of Malala) in favour of essentiality of origins.

The case of (vi). The essence of the diagnosis is the same in this case: we would need a principle akin to " $\varphi(x) \rightarrow \Diamond \text{Cat}(x)$ " which somehow allowed us to transition, together with knowledge that $\varphi(\text{Gandhi})$, to $\Diamond \text{Cat}(\text{Gandhi})$. The possibility in (vi), by concerning Gandhi as a cat, leaves us also, for the same reasons as above, with no qualitative anchor: there is—and there could be—no φ such that, in virtue of knowing Gandhi to be (or have been) φ he can be known to be able to *subsequently* be a cat.²³ As an instance of $p \rightarrow \Diamond p$ we do have access to $\text{Cat}(x)$

²⁰ Alternatively, the principle could be akin to " $\varphi(x) \rightarrow \Diamond O(xbc)$ ". As what follows in the main text will make clear, nothing essential depends on it.

²¹ Nothing essential depends (either) on the fact that I am constructing this class as containing *pairs* instead of *triples*. I am doing so for vividness.

²² If nomic knowledge allows us to know too that unhealthy sperms and egg cells are only contingently unhealthy, then, we could delete the bracketed qualifications 'healthy' in the main text. I am adding them out of cautiousness and biological ignorance.

²³ Here is a far-fetched scenario reflection on which has clarificatory value. Suppose we had experiences of human beings metamorphosing into cats, into dogs, of dogs into cats, into humans, etc. There is a (reasonable) question here as to whether we would be in front of *human beings, cats, dogs, etc.*, but this issue is inessential to the point I want to make and might distract us away from it. So let me rephrase the supposition in a way that blocks that question: suppose that we had experiences of *human* beings metamorphosing into cats*, dogs*, etc.* In such scenario, *being a human* being* would be apt for the epistemic role that qualitative anchors are said to play: knowledge that Gandhi is a *human* being* would enable us, together with a (would-be) principle that *human* beings can metamorphose into cats**, to transition to knowledge that he can be a *cat**. However, for all we *know*—i.e., with our current/actual state of knowledge—about human beings (and cats, and dogs, etc), the property of *being human* does not

→ $\langle \text{Cat}(x) \rangle$. Yet, this only allows us to know of actual cats that they are possibly cats. If, in the absence of any further reasons, we were to assert or deny that Gandhi belongs to the class determined by ' $\langle x \text{ is a cat} \rangle$ ' we would be displaying epistemic irresponsibility too and likely begging the question against or in favour of, respectively, the thesis of *essentiality of kind*.

According to the methodological recommendation that this paper is following, and as stated at the beginning of §2, this paper's plan has been to start with *simple, basic* cases of *de re* possibility knowledge to then see how far the explanations could be extended to other, less simple cases (of still *basic* modalizing). The end of §3 recorded optimism that some generalization is forthcoming. What the current section provides are reasons, coming from other quarters, for moderate pessimism: the non-rationalist epistemology sketched in §§2-3 is incapable of answering the 'how do we know' question in some cases of (so-callable) remote *de re* possibilities. At most—yet already instructive in itself—, it can shed light on *why* and *how* claims like (v) and (vi) are epistemically more demanding than the simple cases. Roughly: the *impossibility* of qualitative anchors amounts to the impossibility of gathering empirical evidence *in favour of* claims like (v) and (vi). The current knowability model is not designed either to establish impossibilities; like the ones that result from negating (v) and (vi). As a result, the current model can establish neither those claims nor their negations. Given what possibilities (v) and (vi) involve, this proves the account also incapable of elucidating the knowability conditions of *whether* essentialist theses like *essentiality of origins* or *essentiality of kind* are true or not. *If* such essentialist knowledge is attainable, their epistemic grounds will look very dissimilar to what I am submitting as epistemic grounds for simple and basic *de re* possibility knowledge.²⁴

4.1. Clarifications

I shall conclude this section by making some remarks prompted by reflecting further on how the bad reasonings compare to the good ones. They are intended as clarificatory remarks.

First, as anticipated at the very end of §3, the comparison reveals the possibility-relativity of relevant similarity. That is, similarity with respect to the same property φ might be relevant with respect to a given possibility and irrelevant with respect to another possibility. As reflected in the reasonings above, similarity with respect to *being human* is irrelevant when it comes to possible origins but relevant when it comes to the possibility of having a car accident. Analogously, similarity with respect to *being mammal* is irrelevant when it comes to the possibility of being a cat but relevant when it comes to the possibility of living just on maternal milk for a relatively long period.

Second, the badness of the bad reasonings does not depend on the fact that those reasonings involve *expired* possibilities (if possibilities at all). Let us assume that Gandhi could indeed be a cat. By his actually being a human being, he could also be a human being. These two possibilities are not compossible and, as a result, by his having actualized his possibility of being a human

meet the conditions for being (i.e., for acting as) a qualitative anchor. (See the third comment in §4.1 for more about the implications of the notion of *qualitative anchor* being an *epistemic* notion.)

²⁴ One might for instance submit that the absence of empirical evidence in favor of (v) and (vi) should constitute abductive grounds *against* them. Whether such *use* of abduction is epistemically adequate deserves exploration. I am inclined to think that when the absence of empirical evidence is due to its *impossibility* (as in the current cases) the epistemic adequacy of such uses of abduction are dubious. This, perhaps, explains the lack of persuasiveness of abductive arguments that have this feature.

being, his (assumed) possibility of being a cat has expired. The same holds in the case of Malala and her possibility—let us assume—of originating from *b* and *c*. But the fact that these would-be possibilities have expired is not what is responsible for the absence of a qualitative anchor. Kennedy’s possibility of dying of a heart attack has expired too and, yet, there are suitable qualitative anchors—for instance, *being hearted* or *being human*—which allows us, by means of antecedent nomic knowledge, to transition to his possibility of dying of a heart attack. Perennial categorical relations are a potential source of impossible possibilities.²⁵ Examples provided by the preceding remarks include: *being a cat* and *being human*; or *dying of a heart attack* and *dying from being shot*. The moral that we can draw from the treatments of the bad reasonings above is as follows: *when* the entertainment of a non-actualized (perhaps-)possibility which involves a perennial relation—e.g., Malala as originating from *b* and *c*—leaves us with no (possible) qualitative anchor, *testing* is disabled, and this precludes any possibility of *empirically* grounding, in the ways that ordinary modal knowledge has above been motivated to be grounded, the corresponding possibility judgement—e.g., Malala could originate from *b* and *c*. It is the absence of qualitative anchors that the entertainment of some possibilities necessitates what makes the difference. For, as the Kennedy case serves to illustrate, not always the entertainment of one such (perhaps-)possibility leaves us without them. When they do not, testing, along the lines suggested in §2.3, is enabled.^{26, 27}

Third, nothing above suggests that claims (v) and (vi) are false. Nothing, that is, suggests that there is no φ such that “ $\varphi(x) \rightarrow \Diamond O(xbc)$ ” or “ $\varphi(x) \rightarrow \Diamond \text{Cat}(x)$ ” have non-vacuously true instances with an unrealized possibility in their consequents. For all the discussion above has motivated, there could be such φ ’s. Let us assume, for illustration, that “ $\text{Human}(x) \rightarrow \Diamond O(xbc)$ ” is true and, thereby, that “ $\text{Human}(a) \rightarrow \Diamond O(abc)$ ” is a non-vacuously true instance of it. (This assumption amounts to the assumption that any human being could have originated from *b* and *c*.) The notion of *qualitative anchor*, however, is an *epistemic* one: nothing is an epistemic anchor unless it plays the role of allowing us to (groundedly) transition to a given *de re* possibility. What the discussion above gives us reason to believe is that, even if “ $\text{Human}(a) \rightarrow \Diamond O(abc)$ ” were true, *being human* is not an epistemic anchor *when it comes to* possible origins. (It is, for instance, when it comes to the possibility of having car accidents.)

5. Concluding remarks

The epistemology suggested for basic and simple possibility facts allows us to walk some distance in explaining *de re* possibility knowledge. This is what has been motivated in §§2-3. Although *de dicto* modality has not been the focus of this paper, it is worth noting that the current epistemology allows us to walk some distance too in explaining some *de dicto*

²⁵ Perennial properties are properties that satisfy the principle that *once acquired, never lost*.

²⁶ There are various reasons, varied in nature, that advise against directly testing a hypothesis like *hearted animals can die of a heart attack*. Yet, the actual world provides (has provided) enough known cases of people dying of heart attacks for such knowledge to ground the judgment that the hypothesis that *hearted animals can die of heart attacks* has been sufficiently (indirectly) corroborated.

²⁷ When dealing with claims (v) and (vi) we were able to establish more than the mere absence of qualitative anchors; namely, their *impossibility* in those cases. To recall the reason: There could be no φ such that, in virtue of knowing Malala to be φ she can be known to be able to *subsequently* originate from *b* and *c*. I don’t think that their impossibility is salient to mark the difference I wish to mark here in relation to other expired possibilities. I believe it to be relevant, however, (as briefly suggested in footnote 22), when it comes to scrutinizing the idea that the absence of inductive and empirical evidence for claims like (v) and (vi) provides, in these circumstances, no abductive grounds *against* them.

possibility knowledge.²⁸ For if I know of John that he can break his leg, I (am thereby in a position to) know that there could be someone with a broken leg.²⁹ More generally, for any property ψ such that there is an x of which I know it could be ψ , I can know, derivatively, that there could be *something* that is ψ . Slightly more interestingly, for any property ψ —e.g. *being purple*—such that there is an x that is known to be φ —e.g., a given (known-to-be-)frog—of which I know it could be ψ , I know, derivatively, that there could be a ψ -ing φ —continuing with the example: I know that there could be purple frogs. Yet, I suggested in §3 that it is unclear that this could underwrite knowledge, of any actual cow, that it could be purple; thereby signalling a potential limitation of the account. A consequence of this is that it is thereby unclear too that the knowability model above could underwrite (de dicto) knowledge that there could be purple cows. This signals a potential limitation when it comes to de dicto possibility knowledge too.

In addition, and more saliently for current purposes, there are clear (and necessary) limits to how far we can reach within the *basic (de re)* modal facts. These limits have been illustrated in §4 with cases (v) and (vi). These are cases where qualitative anchors are impossible, so no amount of time from now could be reasonably expected to change the explanatory power of the current knowability model with respect to them.³⁰ The current knowability model does not—and is not designed to explain either—knowledge of *impossibilities*; so it cannot explain our knowledge—if we have it—of the negations of (v) and (vi) either; if we have such knowledge. More generally, therefore, what I am suggesting as epistemic grounds for basic and simple modal facts cannot constitute grounds for or against the long-controversial essentialist claims, like essentiality of kind and essentiality of origins.³¹ There are more essentialist or necessary claims it cannot decide one way or another either. Is Natural Kind Essentialism true? Are the laws of nature contingent or necessary? Is any form of Necessitism true?

The fact that the epistemology sketched above is, on the one hand, so (necessarily) limited and, on the other, the sort of epistemology I find to best explain our access to *de re* possibilities (about concrete entities), however, does not mean that I believe that essentialist or necessity knowledge concerning those claims is unattainable. For all that has been developed here, some such (perhaps-)truths might still be knowable *somehow else*. I have in the past been very close

²⁸ De dicto *necessities* require a different treatment altogether.

²⁹ This relies on the intuition that also supports the uncontroversial Converse Barcan Formula: $\exists x \diamond \varphi(x) \rightarrow \diamond \exists x \varphi(x)$.

³⁰ This need not be so with the *perhaps*-limitations of the current knowability model. As just recapitulated in the main text, I suggested in §3 that our confidence across modal judgments varies: I have no doubt that Messy can break, but I'm less confident, though tend to believe, that there could be naturally purple cows. I tend to believe so because, even if scarce, there are some naturally purple animals; I am less confident because they are all genetically quite distant from cows. Perhaps the justification that I get, for the possibility of purple cows, from the existence of those other purple animals is insufficient to turn my modal judgment into a piece of knowledge (even if it is/were true). If insufficient, I do not know (at least not by those inductive means) that there could be naturally purple cows. If I do not know it by these means, then, the current model does not (consequently) explain *how* do I know it. This would then be another limitation of the account. This type of limitation, however, differs from the ones dealt with in §4 in that, in these cases but not those, *we cannot rule out* that time—more accurately: future evidence—will change our epistemic situation with respect to them.

³¹ It does constitute grounds against some (rarely endorsed) essentialist claims. For, our *de re* possibility knowledge puts us in a very good position to obtain *partial* knowledge of essences. If I know that I can break any of my arms, I am thereby in a position to know that, whatever my essence is, it does not preclude the breaking of my arms. So, although I have never broken any of them, I know it is not essential to me not to have broken arms.

to get convinced about a diagnosis of unknowability. I now doubt that to the point that I am not sure that even agnosticism is the right attitude. (I am not sure either, however, whether I was then, or I am now, hostage of an excessive display of risk-adverseness.)

Part of what is shaking my beliefs is the emergence and variety of very serious attempts at establishing controversial essentialist or necessary theses that the recent years have witnessed. It is striking to see all these theories making explicit use of abduction as what provides the required epistemic grounds. Biggs (2011), for instance, argues by abduction that water is essentially H₂O. Hale (2013) argues by abduction in favour of Sortal Essentialism and then motivates Essentiality of Origins for Organisms and Natural Kind Essentialism. Williamson (2013) argues, by abduction too, in favour of Necessitism. This current scenario suggests that *explicitly abductive* methods are entering modal epistemology very powerfully. (This is further supported by works in the epistemology of modality which, although not devoted to essentialist or necessary claims, are also using abduction as their explicit methodology.³²) The epistemic adequacy of each of these abductive routes to pieces of essentialist or necessity knowledge must be individually scrutinized; I would say as a matter of priority.

I want to close, however, with a remark on the impact that the (potential) satisfactoriness of such abduction-based epistemologies of *essence/necessity* could have on the epistemology developed in this paper vis-à-vis the theoretical recommendation (from §1) it is partly a reaction to. The remark is a defence against a potential objection. Suppose that abduction (together with the relevant data as explanandum) is strong enough to enable us to know enough necessary/essential facts so as to support a (moderate) *necessity-first* approach to modal knowledge (in the sense of (Hale 2013, 253)). The objection that can be mounted on this supposition is that this would make the epistemology sketched in this paper redundant. For, under this supposition, any *de re* possibility knowledge would be explainable as derivative of necessary/essentialist knowledge.

I do not need to quarrel the idea that any *de re* possibility knowledge would be so explainable. I shall, instead, offer reasons for the claim that, even in that scenario, the basic and simple *de re* possibility knowledge that the above epistemology manages to explain would still be *best explained* by it. In other words: even if the abduction-based epistemologies of essential/necessary facts mentioned above survive scrutiny, we will have reasons to abduct to the sort of induction-based epistemology of basic and simple *de re* possibility facts defended here. This is sufficient to block the redundancy suspicion. The argument is short, and its essence has already been anticipated in passing in §1. The persuasive power of abduction arguments—if wanted, one can qualify this thus: ‘at least when it comes to abductive arguments for essential/necessary facts’—is less than that of the (in essence) induction-based arguments suggested here for basic and simple *de re* possibility facts. This does some work towards explaining the asymmetry in confidence about ordinary possibility facts and essential/necessary facts noted in §1. But it also rules out that our *de re* possibility knowledge is dependent on knowledge of essential/necessary facts. If it were so dependent, our degree of confidence in the ordinary possibility facts would need to be upper-bounded by our degree of confidence in their (essentialist) premises in a way that it is not. If faced with the dilemma of having to choose (for

³² See for instance Hanrahan’s (2007) abductive way of accounting for possibility knowledge; or Fischer’s (forthcoming) use of abduction to help us decide between different epistemologies of modality.

these reasons) between our irrationality and the inadequacy of essence-based epistemologies, I would find the latter more credible.³³

This already suggests very strongly that a sufficiently comprehensive epistemology of modality cannot look uniform: possibility knowledge and essentialist/necessity knowledge have independent grounds. The suggestion is even stronger if one recalls attention to the fact that this paper has remained silent about an epistemology of what Divers calls ‘advanced modalizing’ which, saliently, includes modalizing about *abstracta*. (I believe that an epistemology of modality for *abstracta* requires a very different treatment, and this should be material for a future project.)

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References

- Biggs, Stephen (2011). ‘Abduction and Modality’, *Philosophy and Phenomenological Research*, Vol. LXXXIII/2: 283-326.
- Bird, Alexander. (2004). ‘Lowe on A Posteriori Essentialism’, *Analysis*, 68/4: 336-344.
- Bueckner, Anthony (2001). ‘Chalmers’s Conceivability Argument for Dualism’, *Analysis*, 61: 187-193.
- Divers, John. (1999). ‘A Genuine Realist Theory of Advanced Modalizing’, *Mind*, 108/430: 217-240.
- Elder, Crawford (2005), *Real natures and familiar objects*, CUP.
- Fischer, Robert (2015). ‘Theory selection in modal epistemology’, *American Philosophical Quarterly*, 52/3: 289-304.
- (this volume). ‘Modal empiricism: objection, reply, proposal.’
- Hale, Bob (2013). *Necessary Beings. An Essay on Ontology, Modality, and the Relations Between Them*, Oxford: Oxford University Press.
- Hanrahan, Rebecca (2007). ‘Imagination and Possibility’, *The Philosophical Forum*, 38/2: 125-146.
- Hawke (this volume). ‘Can Modal Skepticism Defeat Humean Skepticism?’
- Horvath, Joachim (2014). ‘Lowe on Modal Knowledge’, *Thought: A Journal of Philosophy*, 3/3: 208-17.
- Leech, Jessica (2011). ‘Modal Rationalism’, *Dialectica*, 65/1: 103-115.
- Leon, Felipe (this volume). ‘From modal skepticism to modal empiricism.’

³³ The persuasiveness of this reasoning is not diachronic. The fact that there is a time when the asymmetry holds is sufficient for the argument to retain its persuasiveness even if, eventually, our degree of confidence in essential matters manages to match that in ordinary matters.

- Martínez, Manolo (2013). 'Ideal Negative Conceivability and the Halting Problem', *Erkenntnis*, 78/5: 979-990.
- Mizrahi, Moti & Morrow, David (2014). 'Does conceivability entail metaphysical possibility?', *Ratio*, 26/4:
- Nolan, Daniel (this volume). 'Naturalised modal epistemology.'
- Peacocke, Christopher (1999). *Being Known*, Oxford: Oxford University Press
- Roca-Royes, Sonia (2007). 'Mind-Independence and Modal Empiricism', *Proceedings of the 4rth Latin Meeting in Analytic Philosophy*: 117-135.
- (2010). 'Modal Epistemology, Modal Concepts and the Integration Challenge', *Dialectica*, 64/3: 335-361.
- (2011a). 'Conceivability and De re Modal Knowledge', *Nous*, 45/1: 25-49.
- (2011b). 'Modal Knowledge and Counterfactual Knowledge', *Logique et Analyse*, 54/216: 537-552.
- (2012). 'Essentialist Blindness would not preclude counterfactual knowledge', *Philosophia Scientiae*, 16/2: 149-172.
- Salmon, Wesley C. (1953). 'The Uniformity of Nature', *Philosophy and Phenomenological Research*, 14/1: 39-48.
- Strohminger (forthcoming). 'Perceptual knowledge of nonactual possibilities', *Philosophical Perspectives*, 29.
- Tahko, Tuomas (this volume). 'Empirically informed modal rationalism.'
- Vahid, Hamid (2006). 'Conceivability and Possibility', *Philosophical Explorations*, 9 (3): 243-260.
- Vaidya, Anand (2008). 'Modal Rationalism and Modal Monism', *Erkenntnis*, 68/2: 191-2012.
- Williamson, Timothy (2002) 'Peacocke's Theory of Modality', *Philosophy and Phenomenological Research*, Vol.LXIV, N°3, 649-654.
- (2007). *The Philosophy of Philosophy*, Malden, MA: Wiley-Blackwell.
- (2013). *Modal Logic as Metaphysics*: Oxford: Oxford University Press.
- Worley, Sara (2003). 'Conceivability, Possibility and Physicalism', *Analysis*, 63:15-23.
- Wright, Crispin (2002), 'On Knowing What is Necessary: Three Limitations of Peacocke's Account', *Philosophy and Phenomenological Research*, Vol.LXIV, N°3, 655-662.
- (2004). 'Warrant for Nothing (and Foundations for Free)?' *Aristotelian Society Supplementary Volume*, 78/1: 167-212.