

# The Problem of Modal Epistemic Friction, Similarity, Essence and Induction

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## Abstract

Vaidya & Wallner [2021] have recently formulated the *Problem of Modal Epistemic Friction* (PMEF) for three of the most discussed accounts in the epistemology of modality: conceivability-based, counterfactual-based and deduction-based accounts. They propose essentialist solutions in all three cases, arguing that all three discussed accounts should be supplemented by a suitable epistemology of essence. In this paper I argue that the PMEF also applies to Roca-Royes' similarity-based account in the epistemology of modality. I also discuss if or to what extent the version of the PMEF that applies to Roca-Royes can be given an essentialist solution. With regard to this question, I argue that besides the *inductivist variant* of the similarity-based account that Roca-Royes favors, there might also be an *essentialist variant* that would be successful in at least some cases. As for Roca-Royes' *inductivist variant* I argue that the PMEF ultimately boils down to the notorious Problem of Induction. I shall discuss a popular solution to the Problem of Induction and the role essences might play in it.

## Keywords

epistemic friction; epistemology of modality; essence; induction; modality; similarity

## 1 Introduction

Vaidya & Wallner [2021] have recently formulated the *Problem of Modal Epistemic Friction* (PMEF) for three of the most discussed accounts in the epistemology of modality:

conceivability-based, counterfactual-based and deduction-based accounts. They argue that in order for conceivability-exercises, counterfactual imagination and deductive reasoning in the epistemology of modality to not lead us astray, they must be adequately constrained. In other words, some sort of *epistemic friction* must be in place for said means of reasoning to not over- or undergenerate modal beliefs. According to Vaidya & Wallner [2021], in the case of the theories discussed, it is plausible that *essentialist* propositions or principles create the epistemic friction required. The authors, moreover, argue that the PMEF requires some epistemic access to essentialist propositions or principles qua epistemic friction creators. This leads them to the conclusion that conceivability-based, counterfactual-based and deduction-based accounts in the epistemology of modality need to be supplemented by some account of the epistemology of essence.

This paper seeks to further develop the discussion of the PMEF by applying it to another intensely discussed approach in the epistemology of modality: Sònia Roca-Royes' similarity-based account. It further discusses if or to what extent the version of the PMEF that applies to Roca-Royes can be given an essentialist solution. With regard to this question, I argue that besides the *inductivist variant* of the similarity-based account that Roca-Royes favors, there might also be an *essentialist variant* that would be successful in at least some cases. As for Roca-Royes' *inductivist variant* I argue that the PMEF ultimately boils down to the notorious Problem of Induction. I shall discuss a popular solution to the Problem of Induction and the role essences might play in it.

Here's the plan: in section 2 I briefly revisit the discussion around the PMEF as it has occurred so far and I draw a distinction between two different kinds of epistemic friction. I further show that, despite Vaidya & Wallner [2021] suggesting an essentialist solution to the PMEF for all of the three accounts they discuss, the PMEF is logically independent from essentialism. Even though essentialist propositions (and/or principles) are natural epistemic friction creators for some accounts of modal knowledge, there might be accounts for which epistemic friction might be created independently of essentialist propositions. Section 3 applies the PMEF to Roca-Royes' account and embarks on the question whether or to what extent (knowledge of) essence can help solve the PMEF for Roca-Royes. In this section I propose that there might be two variants of the similarity-based account: an essentialist one and an inductivist one as well as that on the inductivist variant the PMEF extends to the Problem of Induction (PI). In section 4 I am going to discuss a popular response to the PI, that is also Roca-Royes' preferred solution: the Hinge Epistemology Solution (HES). I fend off an argument according to which the PMEF does not arise on the HES and I assess the prospects of an *essentialist solution* to the inductivist version of the

PMEF on the HES. Section 5 concludes.

## 2 The Problem of Modal Epistemic Friction (PMEF)

In this section I shall briefly sketch the PMEF as it is discussed in Vaidya & Wallner [2021] in order to bring the reader up to speed. The PMEF applies to different accounts in different ways.

*Conceivability-based accounts* in the epistemology of modality (like, e.g., Yablo [1993], Chalmers [2002]) argue, very roughly, that if we find  $p$  conceivable (in some suitable way), we have evidence to belief that  $p$  is possible (in some suitable way). The PMEF for those kinds of accounts starts from the observation that our conceivability- or imagination-exercises need to be restricted to not over-generate possibilities. Take the following example. Suppose you ponder whether there could be transparent iron. Arguably, you can conceive of there being transparent iron (at least in some version of conceivability). But, so goes the flat-footed question, how can you be sure that the imagined or conceived transparent iron really is *iron*? In order for this conceivability-exercise to not lead you astray with regard to the question as to whether transparent iron is indeed substantively possible, this conceivability-exercise needs to be restricted. In other words, your conceivability-exercise needs some epistemic friction. Vaidya & Wallner [2021] argue that what creates epistemic friction in such cases is essentialist knowledge, i.e., knowledge of the essence of iron. On their view, conceivability-based accounts in the epistemology of modality have to be supplemented with a suitable epistemology of essence.

*Counterfactual-based accounts* in the epistemology of modality (like, e.g., Williamson [2007a, 2007b]) argue, very roughly, that due to the fact that we can analyze modal claims in terms of counterfactual claims, the epistemology of counterfactuals is a possible way for us to get knowledge of modality. Williamson [2007b] argues that the following equivalence holds:

$$(\Box) \quad \Box p \leftrightarrow (\neg p \Box \rightarrow \perp)$$

The necessary is that whose negation *would* imply a contradiction.

The idea is that if we can come to know the right-hand-side of  $(\Box)$ , we can come to know its left-hand-side. How do we know the counterfactual conditional on the right-hand-side of  $(\Box)$ ? According to Williamson, we do so in the very same way that we can come to know any kind of counterfactual: we *suppose* the antecedent ( $\neg p$ ) either by perceptually or non-perceptually *imagining* that scenario; and we *develop* the supposition by adding

reasoning, *offline predicative mechanisms* and other offline judgments and *background knowledge and beliefs*. If we are led to a contradiction, we have reasons to believe in the counterfactual (Williamson [2007b: 152–3]). This makes for the following schema:

1. Imagine  $\neg p$ .
2. Counterfactually develop  $\neg p$  (using offline mechanisms and background beliefs).
3. If this leads to a contradiction, assent to ' $\Box p$ '.

According to this schema we are able to come to know that it is *necessary* that gold is the element with atomic number 79, ( $\Box \text{Gold}=\text{E}_{79}$ ), by imagining that gold is not the element with atomic number 79, ( $\neg \text{Gold}=\text{E}_{79}$ ) and counterfactually developing this supposition. However, the only way to derive the needed contradiction from the supposition that gold is not the element with atomic number 79 ( $\neg \text{Gold}=\text{E}_{79}$ ) through counterfactual development, is that we hold fixed the background belief that gold indeed is the element with atomic number 79 ( $\text{Gold}=\text{E}_{79}$ ). This background belief is what provides epistemic friction and what restricts counterfactual imagination appropriately. But why hold fixed this piece of background information in this counterfactual development of precisely the negation of this information? Vaidya & Wallner [2021] argue that we should do so, because this background information is an essentialist truth about gold. What creates epistemic friction in such cases is essentialist knowledge, *i.e.*, knowledge of the essence of gold. On this view, counterfactual-based accounts in the epistemology of modality have to be supplemented with a suitable epistemology of essence.<sup>1</sup>

*Deduction-based accounts* in the epistemology of modality (like, *e.g.*, Kripke [1971], Hale [2013, 2018], Mallozzi [2021a]), argue, very roughly, that we can come to know modal propositions through deductive inferences following, broadly, something like this Kripkean inference pattern:

- (1)  $p \rightarrow \Box p$
- (2)  $p$
- (3) Thus,  $\Box p$

The PMEF for such accounts lies in the crucial question as to what instances of (1) do in fact hold. Any inferential knowledge is only as good as the knowledge of its premises. What creates epistemic friction in this inference pattern, is knowing which instances of the

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<sup>1</sup> Mallozzi [2021c] makes a similar point.

major premise (1) hold. According to Kripke, a principle like (1) is true if  $p$  is an essentialist fact. Interpreting this broadly along the lines of Fine [1994],<sup>2</sup> Vaidya & Wallner [2021] argue that in such cases, it is very plausible that what creates epistemic friction in such deduction-based accounts is essentialist knowledge, *i.e.*, both, knowledge of what is true in virtue of the essence of some  $x$  (the minor premise), as well as knowledge of some essentialist principle (the major premise) of the following form:

$$(E) \quad \Box_x p \rightarrow \Box p$$

If  $p$  is true in virtue of the essence of  $x$  (or: essential to  $x$ ),  $p$  is necessary

Hence, on this view, deduction-based accounts in the epistemology of modality must be supplemented with a suitable epistemology of essence.<sup>3</sup>

Vaidya & Wallner [2021] argue that in all three accounts discussed by them the epistemic friction creators are essentialist propositions (and/or principles). In this connection, it is worth taking note of two things that are not explicitly discussed in Vaidya & Wallner [2021].

*First*, the PMEF applies to different accounts in different ways. As we have seen, our conceivability- and counterfactual imagination exercises require epistemic friction in the sense of them being in need to be *restricted*, so as to not over-generate possibilities. On the other hand, deduction-based accounts require epistemic friction, not in the sense of restriction but in the sense of *traction*. What we need in those accounts are valid instances of the principle in the major premise, (1), in order to get off the ground, in the first place. Without friction, *qua restriction*, the cognitive capacities in the first two accounts would overshoot their target and run wild. Without friction, *qua traction*, deductive modal knowledge would not get off the ground.<sup>4</sup> It is possible to capture that difference by speaking of *restrictive friction* in the first sense and of *tractive friction* in the second.

*Second*, Vaidya & Wallner [2021] suggest essentialist solutions to the PMEF with regard to all three accounts discussed. However, the arguments for (epistemic access to) essence

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<sup>2</sup> See Fine [2022] for a discussion of Kripke's notion of essence in relation to Fine's.

<sup>3</sup> The conclusion in the discussion of all three accounts was always that they need to be supplemented with a suitable epistemology of essence. This presupposes that the PMEF entails that we do in fact need to know or have some epistemic access to the epistemic friction creators. This assumption can be resisted, however. Unfortunately, I do not have the space to discuss this issue here. See Vaidya & Wallner [2021: §6] for discussion.

<sup>4</sup> This, to unpack the metaphor some more, correlates to two actual ways in which friction works on physical things. Friction between a surface area and, say the wheels of a car, is what *limits* or *restricts* the car's breaking distance. That same friction, however, is also what provides traction to get the car going in the first place.

being the respective epistemic friction creator seem to be stronger for conceivability- and counterfactual-based accounts than they are for deduction-based accounts. Being acquainted with at least some aspects of the nature or essence of the entities involved seems *indispensable* for our conceivability- or counterfactual imagination exercises to be appropriately constrained so as to not lead us astray. On the other hand, with regard to deduction-based accounts, while essentialist principles and essentialist knowledge are one way to create epistemic friction, there might be other ways of choosing true instances of (1) that might not involve essences. For the purposes of this paper, the most important lesson from this is that the PMEF is, in principle, logically independent from essentialism in the philosophy of modality. Whether the PMEF applies to an account in the epistemology of modality is one question; whether the PMEF for that respective account can be given an essentialist solution or whether an essentialist solution is the only one, are quite different questions. In the following section, I wish to tackle these different questions for Roca-Royes' similarity-based account of modal knowledge.

### 3 Roca-Royes, friction, essence and induction

Sònia Roca-Royes [2017] provides an account of our knowledge of unrealized *de re possibilities* concerning *concrete* (non-abstract) entities. In as much as this account has very restricted scope, Roca-Royes endorses a non-uniformist view, according to which different epistemic means (like, e.g., conceivability, deduction, induction, intuition, etc.) might be required for different areas or kinds of modal knowledge. While uniformism endorses a one-size-fits-all approach that tries to provide one uniform account to cover all areas or kinds of modal knowledge, the non-uniformist proceeds in a more piecemeal fashion, using a divide and conquer strategy, according to which different areas or kinds of modal knowledge might be accounted for in quite different and diverse ways.<sup>5</sup> My aim in this section is to investigate in what sense the PMEF applies to Roca-Royes' (restricted) account and to discuss if or to what extent (knowledge of or epistemic access to) essence can play a role in the solution to the respective PMEF.

Roca-Royes employs an empiricist-friendly, ultimately *inductive* method in her account. Her approach centers around the notions “similarity” and “epistemic counterpart” and is supposed to account for our knowledge of the following possibilities (among others):

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<sup>5</sup> See Roca-Royes [2018], Sjölin-Wirling [2020] and Mallozzi [2021b] for discussion.

- (i) The possibility that the wooden table in my office breaks
- (ii) The possibility that John Kennedy dies of a heart attack
- (iii) The possibility that Gandhi is born on 1/10/1869
- (iv) The possibility that Obama is born in Washington [Roca-Royes 2023: 156]

Let's start with the first example. The idea is that we come to know that it is possible for some wooden desk, call it *Messy*, to break, on the basis of our knowledge that a similar wooden desk, call it *Twin-Messy*—which is, as we shall see, an *epistemic counterpart* of *Messy*—actually broke. Roca-Royes envisions this being done roughly along the lines of the following inference pattern:

- (R1) S knows (via perception, say) that Twin-Messy (TM) actually broke.
- (R2) S knows that what is actual is possible. (T-axiom)
- (R3) So, S can warrantedly transition to: it is possible that TM breaks.
- (R4) S knows that “objects similarly made out of the same sort of materials are susceptible to similar effects” (Roca-Royes [2017: 227]) (SMuSE-principle<sup>6</sup>)
- (R5) S knows that Messy (M) is similarly made out of the same sort of materials as TM was made. (Similarity)
- (R6) So, S can warrantedly transition to: it is possible that M breaks.

The crucial premise in this inference pattern is (R4). (R4) is the principle that allows for the transition from knowledge of the actualized possibility concerning Twin-Messy to knowledge of unrealized possibility concerning Messy. So, in our terminology (R4) is what creates (*tractive*) *epistemic friction* in Roca-Royes' account. It seems that the crucial question of the PMEF applied to Roca-Royes' account is how we know (or have epistemic access to) (R4), the SMuSE-principle. The fact that (R4) is a principle concerned with similarity makes it plausible then that the account is called similarity based. But one might wonder why I have been qualifying the account as *inductive*. The inference pattern above is not inductive. Indeed, it seems to be a deductive inference pattern.<sup>7</sup> The reason why

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<sup>6</sup> 'SMuSE' for 'same materials, similar effects'

<sup>7</sup> Strictly speaking, (R1–6) is not a deductively valid argument. For it to be deductively valid, some closure principles connecting knowledge and warrant transition must be supplemented. With those in place, however, the inference would be deductively valid. (Thanks to an anonymous reviewer for pushing me to clarify this.) The point is that (R1–6) exhibits deductive features much rather than inductive ones.

Roca-Royes' account is ultimately an inductive one, as we shall see later in this section, is that it ultimately holds that we derive justification for the crucial similarity premise in (R4) via inductive ways.

Before we can discuss this inductivist part of her account, however, we need to note a problem concerning the generality of the formulation of the SMuSE-principle in (R4). The SMuSE-principle is indeed the epistemic friction creator in the Messy/Twin-Messy case, *i.e.*, concerning our pursuit of knowledge of the possibility in (i) above. Yet, the SMuSE-principle is not general enough to cover all of the cases that Roca-Royes' view is supposed to account for. Take the second example from above, (ii). Arguably, dead Kennedy, shot in Dallas, *i.e.*, JFK's corpse right after the shooting, is "similarly made out of the same sort of material" than living Kennedy, *i.e.*, the man in the car from moments before the assassination. However, while living Kennedy can indeed still die of a heart attack (before the bullet hits him), it is not true that dead Kennedy can die of a heart attack. That is just to say that the material make-up alone does not make for the *relevant similarity* in all cases. Still, of course, the idea is that Kennedy is *relevantly similar* to somebody who has actually died of a heart attack *with regard to (ii)*, *i.e.*, with regard to the possibility of dying of a heart attack, just like Messy is *relevantly similar* to Twin-Messy *with regard to (i)*, *i.e.*, with regard to the possibility to break. This relevant similarity constitutes what Roca-Royes calls the *epistemic counterpart relation*. So, more generally speaking, what creates epistemic friction here and, thus, what we need to be able to epistemically access is whether the things involved are indeed *epistemic counterparts*, *i.e.*, *relevantly similar*. However, as we have seen, what makes for two things to stand in that epistemic counterpart relation does not seem to be the material make-up in all cases. So, knowing what the *relevant similarity* is that constitutes the epistemic counterpart relation, unsurprisingly, varies from (type of) case to (type of) case. This is to say that whether *a* and *b* are epistemic counterparts depends on the kind of epistemic goal we pursue, *i.e.*, the kind of possibility (like in (i)-(iv)) that we seek epistemic access to (*cf* Roca-Royes [2017: 234]). One way to account for this is to let it be reflected in the adicity of the epistemic counterpart relation.

- (EC) For any group of entities,  $a_1$ - $a_n$ , and any (kind of) possibility (or modal property), *P*, that we set as our epistemic goal,  $a_1$ - $a_n$ , are epistemic counterparts with respect to *P* just in case  $a_1$ - $a_n$  are relevantly similar in a respect conducive to *P*.

With regard to the possibility of burning (or the modal property of flammability), all white plywood desks are epistemic counterparts, since they are "similarly made out of the same sort of materials" and, hence, "are susceptible to similar effects" (Roca-Royes [2017: 227]). However, with regard to the possibility of burning (or the modal property of flammability),



a white plywood desk and a white puddle of milk are not epistemic counterparts. While they are similar in some respect (both are white), they are not similar in the relevant respects that are conducive to the possibility or modal property at issue.

Hence, the crucial question with regard to the PMEF for Roca-Royes' account seems to be this:

(Q) How do we know what respects of similarity are conducive to P?

If we take that what creates (tractive) epistemic friction in Roca-Royes' account to be an answer to (Q), then we get the following more generalized inference pattern:

- (R1\*) S knows some entity,  $a_1$ , actually has property F.
- (R2\*) S knows that what is actual is possible. (T-axiom)
- (R3\*) So, S can warrantedly transition to: it is possible that  $a_1$  is F.
- (R4\*) S knows that  $a_1$  has categorical property G that is conducive to the possibility, P, of having F (*viz.* to the modal property, P, of possibly being F).<sup>8</sup> (Answer to Q)
- (R5\*) S knows some other entity,  $a_2$ , similarly has G. (Similarity)
- (R6\*) So, S can warrantedly transition to: it is possible that  $a_2$  is F.

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<sup>8</sup> One might wonder about the notion “conductive” in (R4\*). Is this supposed to indicate that something which is G is *likely* to have the modal property, or that everything that is G has the modal property in question? Indeed, both interpretations are possible. As I argue later in the paper, there might be two versions of the similarity-based approach in (R1\*–6\*), depending on how one seeks to justify (R4\*). I can know (R4\*), *i.e.*, that some categorical property G is conducive to the possibility, P, of having F (*viz.* to the modal property, P, of possibly being F) by knowing that G is *sufficient* for P (due to, *e.g.*, essentialist knowledge about what it is for some  $x$  to be G). But I can also know (R4\*), that G is conducive to P, by induction, like Roca-Royes argues. Since one of the main points in this paper concerns the distinction between two possible versions of the similarity-based account, (R1\*–6\*), I want to deliberately leave open both interpretations of “conductive” in (R4\*). On a related note, one might worry whether the first interpretation of “conductive” in (R4\*), *i.e.*, the inductive justification of (R4\*) renders the whole inference pattern inductive. I don't believe it does. Clearly, if (R1\*–6\*) lies at the heart of the similarity-based method and the crucial premise of this inference pattern, (R4\*), is to be justified inductively, this renders the *method* inductive. The *inference pattern* itself, however, might still be deductive (or as deductive as (R1–6)—see also fn 7). To see this more clearly, consider the classical example of a deductive inference pattern, that derives from the mortality of all humans and Socrates' being a human the conclusion that Socrates is mortal: even if I inductively justify that all humans are mortal, this does not render this inference pattern itself inductive. Thanks to an anonymous reviewer for pushing me on these points.

So how do we know (R4<sup>\*</sup>)? How do we go about answering (Q)? How do we know which categorical properties correlate to which modal properties? Let's start this discussion by pondering whether (knowledge of or epistemic access to) essence does or can play a role in an answer to (Q) and, thus, in a solution to the PMEF for Roca-Royes' account. It seems plausible that at least *in some cases* (Q) can be given an essentialist answer. Take the following example: the other day I banged my toe on the washing machine in my basement. The washing machine had a very painful causal effect on my foot. Following Roca-Royes' inference pattern, from this I can come to know that it is *possible* for my washing machine to have a causal effect on me (via the T-axiom). Now my neighbor tells me she has also bought a washing machine. I find our washing machines similar enough to conclude that her washing machine, like mine, is capable of causally affecting me. Now what is the relevant respect with regard to which our washing machines are similar? This, as we have seen, depends on the possibility or modal property in question. Suppose the target modal property is really just general capability of having a causal effect, *i.e.*, causal efficacy. In this case the relevant categorical property is not as specific as being a washing machine but as general as being *concrete* (as opposed to abstract). Concreteness is thought to correlate to causal efficacy. But how do we know that? Well, since causal efficacy is definitional, *i.e.*, essential for concreteness, in this case it is plausible that we can come to know the correlation between causal efficacy and concreteness by being acquainted with the essence or nature of the latter. Hence, it seems that there are cases in which (knowledge of) essence can play a role in the answer to (Q).

Another way in which essences could be thought to play a role in solving Roca-Royes' PMEF trades on the idea that the scientific story about the correlation between some categorical and some modal properties pertains to the *essence* of the natural kinds in question. Imagine the following scenario: take two qualitatively identical ice trays. In one of them you pour water, in the other one you cast iron (suppose the ice trays are fireproof enough not to melt during this process). Put both ice trays in a really good freezer. Let them freeze over for a couple of days. Now, when you take them out, the ice cubes and the iron cubes resemble each other in a number of respects. They are at the same temperature and the same shape. However, the ice cubes and the iron cubes are not epistemic counterparts with regard to the modal property of breakability. How do we know that? We know that breakability is connected to the type of microstructure of the respective materials. Now suppose we follow Kripke [1980] and Putnam's [1975] view that natural kinds have essences. Presumably the type of microstructure and, thus, the breakability is a good candidate for an essential property of the natural kind in question. So, we might come to know that the

ice and iron cubes are not epistemic counterparts by having knowledge of the respective essential facts concerning their microstructure (together with knowledge of the connection between microstructure and breakability.)

Note that these examples of a potential essentialist solution to Roca-Royes' PMEF are importantly different. While we might have *a priori* knowledge of the fact that it is definitional for (essential to) concrete objects to be causally efficacious through philosophical analysis, the scientific knowledge of both the correlation between breakability and microstructure and the fact that it is essential to a kind of material to have the microstructure it has is, plausibly, *a posteriori*. It is important to note that, contrary to traditional belief, the epistemology of essence, does not need to be exclusively *a priori*. See, e.g., Mallozzi [2021a, 2021c] for a moderately empiricist account of knowledge of essence.

To be clear, while both these examples, if sound, might be capable of establishing the *possibility* of an essentialist solution to Roca-Royes' PMEF, they by no means entail that Roca-Royes' PMEF *requires* an essentialist solution. While we *can* come to know the correlation between concreteness and causal efficacy or between crystalline bonding and breakability through knowledge of their respective *essential* connection, there might be other means to have epistemic access to these correlations. The success of those other means (in part) depends on whether we need to know that the respective correlation between a categorical and a modal property holds *essentially* or whether it suffices to know that this correlation holds. Assuming that being human is essential to Socrates, knowing that Socrates has this (essential) property, *i.e.*, knowing that he is human is quite different from knowing that Socrates is *essentially* human. In the former case we have knowledge of an *essential* proposition: we know that Socrates is human (which is essentially so). In the latter case we have knowledge of an *essentialist* proposition; we in fact know *that it is essential* that Socrates is human. I shall now turn to Roca-Royes' non-essentialist answer to (Q), *i.e.*, her non-essentialist attempt to solve the PMEF which will involve the rejection of the need for *essentialist* knowledge on the account at hand.

The reason why Roca-Royes' similarity-based account deserves the qualification *inductive* is not that the inference pattern in (R1–6) and (R1\*–6\*), respectively is itself inductive but that the crucial premise (R4) or (R4\*) is *justified in an inductive way*. Roca-Royes offers an inductive answer to (Q). Her idea is that we have inductive evidence of the correlation between certain categorical and certain modal properties. Take the desk example. While the correlation between the material make-up (wooden) and the modal property (breakability) might indeed hold in virtue of the *essence* of the natural kind (wood) in question, we do not need to know that. Having experienced numerous wooden things—tables, chairs, boards,

etc.—break, depending on the diversity and width of this induction base, we can eventually gather inductive evidence that the property conducive to breakability is being made from wood, rather than, say, being a table or being sold at IKEA.

Roca-Royes [2017: 229] calls knowledge of (R1) and (R1<sup>\*</sup>), respectively “*categorical knowledge*” and knowledge of (R4) and (R4<sup>\*</sup>), respectively “*nomic-like knowledge*”. In some cases, I might just have categorical knowledge of (R1<sup>\*</sup>)-like premises by seeing, e.g., that a desk is actually broken. However, Roca-Royes [2017: 229] maintains that

[...] 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.

Turning to nomic-like knowledge of (R4<sup>\*</sup>)-like premises, *i.e.*, of principles connecting categorical and modal properties (answers to Q), Roca-Royes [2017: 230] says that, similarly to categorical knowledge, we can arrive at answers to (Q) “by means of a battery of ampliative methods [...], with induction having a salient role”.

It is important to note that Roca-Royes allows for other ampliative methods (besides induction) to go into the generation of nomic-like knowledge. I take it that by doing so, she can handle the following cases better. Suppose that all things that you have hitherto observed breaking were white, for some accidental reason. In principle, this may warrant you in drawing the inductive conclusion that the categorical property correlated to breakability would be whiteness. But this is wrong. And you know that. It is in fact easy for you to know that if you, as you are allowed on Roca-Royes’ account, take on board common-sense knowledge or scientific knowledge about how colors work. In addition to that, it seems reasonable to allow for a multitude of ampliative methods in the generation of nomic-like knowledge for it helps you *interpret* your induction base. Take the washing machine example. Having banged your toe on multiple appliances you are warranted to inductively conclude that everything sold at the appliance store is causally efficacious, which is true. However, it is (if not false then at least) too coarse-grained a claim that the categorical property correlated to causal efficacy is being an appliance. In addition to inductive methodology, we

can (probably even *need to*) apply also *abductive* reasoning, inference to the best explanation.<sup>9</sup>

Roca-Royes emphasizes, however, that on her account, in the pursuit of nomic-like knowledge (*i.e.*, of an answer to Q) induction will have a central role. I have said above that the success of an inductive solution to Roca-Royes' PMEF (as opposed to an essentialist solution), in part depends on whether the account requires that we merely know about the correlation between categorical property F and modal property P or whether we need to know that this correlation holds *essentially*. And indeed, nomic-like knowledge of a principle connecting categorical and modal properties does *not* need to be *essentialist* knowledge in Roca-Royes' account. Even though such a principle might indeed be essential, knowing that it is true suffices in order for the inference in (R1–6) and (R1\*–6\*), respectively to go through.

In this regard Roca-Royes' account is different from the three discussed in Vaidya & Wallner [2021]. Vaidya & Wallner argue that on both conceivability- and counterfactual-based accounts, the epistemic subject *needs* to have some epistemic access to *essentialist* propositions, in order to appropriately restrict conceivability and imagination exercises. Also, for deduction-based accounts, if we take the criterion for what instances of the major premise ( $p \rightarrow \Box p$ ) are true to be an essentialist one, we need to know (a) that essential propositions are necessary ( $\Box_x p \rightarrow \Box p$ ) and (b) about some relevant  $p$  that  $p$  is *essential* (to some  $x$ ) ( $\Box_x p$ ). So, also here we are in need of explicitly *essentialist* knowledge. In this sense, Roca-Royes' account is different. Even though the crucial premise in (R4) and (R4\*), respectively might hold essentially, all we need to have access to is their truth in order for the inference to work.

If this is true, and if we really can have an inductive answer to (Q) and, thus, an inductive solution to Roca-Royes' PMEF, then, trivially, an essentialist solution is not necessarily required. But this does not mean that an essentialist solution is impossible. From what I have said above essentialist solutions to Roca-Royes' PMEF still seem *possible* (at least in some cases). Granted, Roca-Royes' PMEF does not need an essentialist solution (unlike conceivability-, counterfactual-, and (likely) deduction-based accounts), but is her account *compatible* with an essentialist solution, *i.e.*, with an essentialist answer to (Q) creating epistemic friction? Here is a potential argument that it is not:

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<sup>9</sup> Allowing for abductive methods to contribute to the creation of modal epistemic friction in Roca-Royes' account might generate a debate over whether induction or abduction deliver the main contribution to the present PMEF. However, since this paper focusses on the relation between modal epistemic friction, essence, and induction, I shall not discuss this issue here.

Take again the washing machine example. Suppose you have knowledge of the essential connection between concreteness and causal efficacy. If you do, you are already in a position to know that every concrete entity is (essentially) causally efficacious. *i.e.*, you do not even need any concrete experiences with washing machines (or the like) to know that they have the modal property of being causally efficacious. In other words, the essentialist knowledge in this case does not provide (tractive) epistemic friction *for the inductive method* but rather undermines the latter by making it obsolete. Or take the ice cube *vs.* iron cube example. Suppose that you do in fact know that the correlation between the (type of) microstructure and breakability holds *essentially*. Again, you would be in a position to know that every entity with a certain type of microstructure is (essentially) breakable without ever needing to employ an inductive method. The point, again, is that an essentialist answer to (Q) is not *compatible* with an inductivist account, since essentialist information, rather than helping inductive methodology, would undermine the latter by making it obsolete.

This undermining point is valid. If we have essentialist knowledge concerning the correlation between a categorical and a modal property, we don't need inductive evidence. But whether this undermining point speaks against the compatibility of Roca-Royes' account with an essentialist answer to (Q) depends on the precise role induction plays in the account. I take the heart of Roca-Royes' similarity-based account to lie in the general inference pattern (R1\*–6\*). However, this inference pattern is not itself inductive but rather *deductive*.<sup>10</sup> Induction enters the picture as the way to justify (R4\*). So even if (an instance of) (R4\*) would be justified through essentialist information, this would help the similarity-based account, *i.e.*, the inference (R1\*–6\*) to go through, and thus create (tractive) modal epistemic friction for Roca-Royes. So, given the precise role induction plays, an essentialist answer to (Q) is compatible with the account. Taking the undermining point as evidence for the incompatibility of Roca-Royes' similarity reasoning and essentialism would either entail (mistakenly) taking the inference pattern (R1\*–6\*) itself to be inductive or holding that the inductive justification of (R4\*) is inseparable of the similarity-based account. Yet, I think that it is more fruitful to separate the inference pattern from the way in which its premises are justified. On such a picture, a Roca-Royesian similarity-based account comes in (at least) two variations: an *inductivist* one with an inductivist solution to the PME (i.e., an inductivist answer to Q) and an *essentialist* one with an essentialist solution to the PME (i.e., an essentialist answer to Q). This would make essentialism

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<sup>10</sup> At least as deductive as (R1–6). See fn 7 and 8.

compatible with the similarity-based account of a Roca-Royesian provenience ( $R1^* - 6^*$ ).<sup>11</sup>

However, now the undermining point from before might make us think that the two variants are competitors rather than allies. How are we to choose between the two variants? I don't want to engage too much in this question. My aim here was just to argue that an essentialist answer to Roca-Royes' PMEF is possible and compatible with her general account ( $R1^* - 6^*$ ). Note that I have not touched on the question as to which of the two variants, the inductivist one or the essentialist one, is *psychologically more realistic or plausible*, *i.e.*, which variant is effectively more used by real-life modal cognizers. I take it that generally and in principle both variants can do the job, which is to provide (tractive) epistemic friction for ( $R1^* - 6^*$ ). I take it that the question whether ordinary (non-philosophical) cognizers use inductive or essentialist justification of the crucial premise in ( $R1^* - 6^*$ ) strongly depends on the kind of case at issue. While the correlation between wooden and breakable might be recognized by many through inductive methods, the correlation between concrete and causal efficacy is arguably more likely to be recognized due to essentialist information about what it means to be a concrete object. So, at the end of the day, maybe the two variants are not such strict competitors after all; with the one being more applicable to some cases and the other to others.<sup>12</sup> This outcome should not be surprising to someone who subscribes to non-uniformism in the epistemology of modality, *i.e.*, the "divide and conquer" strategy mentioned at the beginning of this section.

So, we have been led to the conclusion that, though an essentialist solution to the PMEF in Roca-Royes' similarity-based account is not necessary, it is at least possible. But, ultimately, we are interested in her own variation of her account: *inductive* similarity-based

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<sup>11</sup> To be clear, I am not aware of any actually existing account in current or historical debates in the epistemology of modality that proceeds along the inference pattern ( $R1^* - 6^*$ ) with an explicitly essentialist justification of ( $R4^*$ ). The point here is just that, at least with regard to some cases, such an account might be successful; essentialist knowledge might in some cases be a way to justify ( $R4^*$ ) and, hence, to provide modal epistemic friction. Possibly, the historical account of modal (and essentialist) knowledge that comes closest to such a variant is Husserl's [1973]. While Husserl does not endorse an inference pattern like ( $R1^* - 6^*$ ), his account pairs similarity-based reasoning with essentialist information in a way that might very well be of interest for an essentialist variant of Roca-Royes' similarity-based account. See, *e.g.*, Wallner [2023] for a recent discussion of Husserl's approach to the epistemology of essence and modality in relation to more contemporary essentialist accounts.

<sup>12</sup> Note that the cases in the examples, *i.e.*, the correlation between wooden and breakable on the one side and the correlation between concrete and causally efficacious on the other, are still both within the bounds of Roca-Royes' restricted domain, which is *de re* possibility knowledge about *concreta*.

reasoning and the application of the PMEF to that specific version. With regard to this, nothing in the above considerations speaks against an inductive answer to (Q), *i.e.*, against an inductive solution to the PMEF. But the question is whether Roca-Royes' PMEF is sufficiently solved, *viz.* whether (Q) is sufficiently answered by just gesturing towards inductive methods of gaining evidence for the correlation between categorical and modal properties. It might not be. And this is something Roca-Royes is well aware of.

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. [Roca-Royes 2017: 229]

This pertains to Hume's notorious *Problem of Induction* (PI). Every inductive inference presupposes and relies on the *Uniformity of Nature* (UN). Hume has argued that no principle stating the Uniformity of Nature could ever be justified. Hume assumes that in order for a principle to be capable of having *a priori* justification, the negation of that principle needs to yield a formal contradiction. However, since no formal contradiction is entailed by the assumption that the course of nature changes, there cannot be an *a priori* justification of the uniformity principle. Further, according to Hume, any *a posteriori* justification of the uniformity principle would rely on induction itself and thus presuppose the uniformity principle. Hence, there cannot be an *a posteriori* justification of the uniformity principle on pain of vicious circularity. Given that, as Hume assumes, those are the only possible ways of justification, the uniformity principle cannot be justified at all. But then inductive inference lacks justification.

To be clear, I do not intend to put the unbearable burden to solve the PI on Roca-Royes. The PI is still generating immense controversy. The philosophical community is far from reaching consent over what would be the best answer to Hume's challenge or over whether there even is an answer to be had. Still, most of us freely acknowledge the possibility of inductive knowledge both in everyday life and in our philosophical theories. So Roca-Royes should be able to do so too.<sup>13</sup> However, since she herself acknowledges that any inductivist answer to (Q) presupposes the Uniformity of Nature and will have to deal with Hume's problem, I take it that the PMEF for her inductivist similarity-based account ultimately

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<sup>13</sup> Note, however, that, as I shall discuss in a bit, Roca-Royes is well aware of the PI being relevant to her account and gestures towards a possible solution. More on this below.



boils down to or extends to the Problem of Induction. Hence, given this paper's interest in applying the PMEF to Roca-Royes' account, something should be said about the Problem of Induction. In addition to that, given this paper's other research interest, which concerns the potential role of essences in the treatment of Roca-Royes' PMEF, we want to ask whether or to what extent (knowledge of or epistemic access to) essence can play a role in the treatment of the Problem of Induction. Of course, the latter question will strongly depend on what kind of reaction to Hume's problem one has in mind.

In the interest of the two research questions of this paper, (a) what the specific nature of the PMEF for Roca-Royes' account is, and (b) whether or to what extent essence can play a role in the treatment of Roca-Royes' PMEF, I will discuss Roca-Royes' preferred solution to Hume's PI in the next section: the Hinge-Epistemology Solution (HES). One would expect that, given that Roca-Royes' PMEF boils down to Hume's problem, any solution to it would count as a solution to the specific PMEF in her account. However, due to the specific nature of the HES, as we shall see, it might seem that on the HES, Hume's PI and, by extension, the PMEF never actually arises in the first place, thereby creating noise for the hypothesis of this paper that the PMEF applies to Roca-Royes' account.

## 4 Essence and the Problem of Induction (PI)

What could be called the "Hinge Epistemology Solution" (HES) to the PI tries to undermine Hume's dilemma by basically denying that our belief in the Uniformity of Nature needs to be justified at all. How so? According to hinge epistemologists, some propositions are so central to our rational thinking that they need to be assumed, accepted, or taken for granted even without having evidence for their truth. Wittgenstein, who can be considered the founding father of this view, calls these propositions "hinge propositions".

That is to say, the *questions* that we raise and our *doubts* depend on the fact that some propositions are exempt from doubt, are as it were like hinges on which those turn.  
[Wittgenstein 1969: §341]

Wright calls these propositions "cornerstones".

Call a proposition a *cornerstone* for a given region of thought just in case it would follow from a lack of warrant for it that one could not rationally claim warrant for any belief in the region. [Wright 2004: 167–8]

The idea is that the Uniformity of Nature is a cornerstone or hinge proposition. Clearly, a lack of warrant for the Uniformity of Nature entails a lack of warrant for any inductively generated belief (for any belief in what could be called the inductive region). This is the gist of Hume's PI. But how does this square with the attempt to undermine the Humean dilemma by denying the need to justify the Uniformity of Nature *qua* cornerstone proposition? The key to this is Wright's distinction between *justification* and *warrant*. Wright has it that all justified belief has rational warrant, but not everything that I am rationally warranted to accept is a justified belief. Besides justification, Wright introduces a second kind of rational warrant, which he calls epistemic *entitlement*. In order to see how this is meant to be a solution to the PI, remember what this problem exactly amounts to. Hume's dilemma has it that neither *a priori* nor *a posteriori* evidence can be had that would justify the belief in the Uniformity of Nature. The point about the HES is to concede that move but to introduce a kind of rational warrant that is different from justification in as much as it does not depend on any kind of evidence.

Suppose there is a type of rational warrant which one does not have to *do any specific evidential work* to earn: better, a type of rational warrant whose possession does not require the existence of evidence—in the broadest sense, encompassing both *a priori* and empirical considerations—for the truth of the warranted proposition. Call it *entitlement*. [Wright 2004: 174–5]

While the HES accepts that we cannot have evidence or justification for the Uniformity of Nature, it claims that due to it being a cornerstone, we are still entitled to accept or trust in the Uniformity of Nature.<sup>14</sup> One kind of entitlement Wright discusses is anchored in the constitutive requirements of rational *action*.

The generic thought is that since rational agency is nothing we can opt out of, we are entitled to place trust in whatever (we have no evidence against and which) needs to be

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<sup>14</sup> Note that entitlement is not warrant to *believe* in some proposition but rather warrant to *accept*, to *act on the assumption of* or to *implicitly trust in* some proposition. This is because believing is more closely tied to evidential warrant (justification), while entitlement is a form of non-evidential warrant. The kind of acceptance that entitlement licenses involves trust (not belief). "It is in the nature of trust that it gets by with little or no evidence. That is exactly how it contrasts with belief proper, and it is not *per se* irrational on account of the contrast. Entitlement is rational trust." (Wright [2004: 194]) For further discussion, see Wright [2004: 175–9, 193–4]

true if rational decision-making is to be feasible and effective. [Wright 2004: 198]

In order for us to be able to act rationally we have to trust in the Uniformity of Nature. We could not act or decide rationally if we could not place trust in “the proposition that nature displays sufficiently many inductively and abductively ascertainable regularities” (Wright [2004: 199]). According to Wright, since the Uniformity of Nature is a cornerstone, a constitutive requirement of rational action, we have rational warrant for accepting or placing trust in the Uniformity of Nature and in the rationality of induction (and abduction) without having (either *a priori* or empirical) evidence for its truth. In his view, “reliance on inductive and abductive methods is the best we can knowledgeably do in pursuit of purposes which are essential to rational agency itself and thus unavoidable” (Wright [2004: 200]).

The HES is Roca-Royes preferred way to deal with the PI. She claims that her “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” (Roca-Royes [2017: 232]). In as much as the PMEF on her inductivist version of the similarity-based account ultimately comes down to the PI, the HES can be considered her preferred answer to the PMEF. Here we need to take note of a peculiarity about the HES that Roca-Royes herself alludes to in passing. She calls the HES a “sceptical solution” and she is right in doing so. As I have noted above, the HES concedes to the Humean skeptic that:

[W]e do indeed have no claim to know, in any sense involving possession of evidence for their likely truth, that certain cornerstones [like the uniformity of nature] of what we take to be procedures yielding knowledge and justified belief [like induction] hold good. [Wright 2004: 206]

So, the HES accepts the skeptical idea but argues that it is still not irrational to rely on induction. Against this background, one might doubt that the HES can even be seen as a *solution* to the PI. Maybe the correct interpretation would be that on a Wittgensteinian or Wrightian picture the PI never really arises.<sup>15</sup> Such an interpretation of the HES might, in turn, threaten my point that the PMEF applies to Roca-Royes’ account. If the PMEF on her inductivist version of the similarity-based account reduces to the PI and if on her account the latter does not arise, the former might not apply. Unfortunately, I do not have the space

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<sup>15</sup> Or, on a more critical note, one might think that the HES has not even addressed (let alone solved) the Humean problem but rather changed the topic.

to discuss the correct interpretation of the HES in relation to the PI. However, fortunately, I think that there is a more direct way to settle the matter with regard to the PMEF.

According to Vaidya & Wallner [2021: S1920], the PMEF consists of two questions:

(PMEF) (i) What is it that creates modal epistemic friction in an account of modal knowledge?

(ii) How do we know that which creates modal epistemic friction?

As we have seen, (i) is a legitimate question for the similarity-based approach, (R1\*–6\*). (i) asks for a justification of (R4\*) or for an answer to (Q). On Roca-Royes' inductivist version of the similarity-based approach that justification/answer involves induction. Hence, as I have argued (and as Roca-Royes implicitly accepts), what provides epistemic friction is, ultimately, the Uniformity of Nature. Is (ii) a legitimate question to ask on the HES approach? Well, while Wright is clear that rational entitlement for the Uniformity of Nature is able to yield *knowledge* of the products of inductive reasoning (Wright [2004: 208]), it seems that that our epistemic access to the Uniformity of Nature itself (*i.e.*, entitlement) falls short of knowledge. However, (ii) can be appropriately relaxed. In fact, in their discussion of Williamson's counterfactual-based account in the epistemology of modality, Vaidya & Wallner [2021: sect. 6] do in fact relax that second question of the PMEF in the following way:

(ii\*) How do we have *epistemic access* to that which creates modal epistemic friction?

Now, this question can legitimately be asked on the HES. What is more, the HES provides a straight-forward answer to it: we have epistemic access to that which creates modal epistemic friction (*i.e.*, the Uniformity of Nature) by means of a non-evidential entitlement of rational deliberation. I conclude that on this very natural and independently motivated (hence, non-ad hoc) relaxation of (ii), the PMEF fully applies to Roca-Royes inductivist variant of the similarity-based account. Moreover, we have seen that the Wrightian HES is Roca-Royes' preferred solution to her PMEF. The HES does fulfill the "formal requirements" of a solution to the PMEF. How good of a solution it is will depend on a material discussion of its benefits and downsides in the debate about the PI, which I cannot go into here.

What remains to discuss is whether (knowledge of or epistemic access to) essence can play a role on the HES, the way it has been presented here. The short answer is: no. At least, essences are unable to play the role they play in the solution to the PMEF of the three accounts discussed in Vaidya & Wallner [2021]: conceivability-, counterfactual- and deduction-based accounts. In those approaches, essences were argued to play an *evidential*

role; essentialist propositions were argued to be what *justifies* premises in deduction-based accounts or what provides *evidence* for an appropriate restriction of our conceivability or imagination exercises. However, the HES for Roca-Royes' PMEF has it that there is (indeed can be) *nothing* that plays an evidential role. What creates epistemic friction on this account is rational entitlement that provides us with warrant to trust in the Uniformity of Nature. Essences cannot play their "usual" role, for nothing can play their "usual" role.

However, there might be a place (albeit a small one) for essences in this picture. According to the HES, the question as to what provides (evidential) justification for believing in the Uniformity of Nature cannot be legitimately asked. (Hence, essences cannot be the answer.) But there is a question in the vicinity that seems legitimate even on the HES. The question is this: *why* is it that we cannot legitimately ask for an (evidential) justification for believing in the Uniformity of Nature? The hinge epistemologist's answer is going to be this: because the Uniformity of Nature is a cornerstone or hinge proposition. But why, one might continue asking, is it that such cornerstones cannot be evidentially justified, why is the cornerstone the end of the explanatory road? Because, so the answer goes, cornerstones are "*essential* to rational agency itself" (Wright [2004: 200]; *emphasis added*). The legitimate question I am talking about is basically asking for a *reason* for why we end the justificatory chain where we end it. It asks for a buck-stopper. Essences are excellent candidates for buck-stoppers.<sup>16</sup> However, this is, admittedly, a very small role for essences. It does not warrant the claim that the HES requires essentialist evidence in its solution to the PMEF—nor the claim that the HES is compatible with essentialist evidence being part of the solution to the PMEF—since the HES essentially excludes evidence in general from the solution to the PI and, hence, from the solution to Roca-Royes' PMEF.

## 5 Conclusion

In this paper, I have discussed how Vaidya & Wallner's [2021] Problem of Modal Epistemic Friction (PEMF) applies to Roca-Royes' similarity-based account in the epistemology of modality, (R1\*–6\*). I have argued that the crucial question with regard to Roca-Royes' PMEF is (Q).

(Q) How do we know what respects of similarity are conducive to (the target possibility or modal property) P?

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<sup>16</sup> See, e.g., Wallner & Vaidya [2020] for discussion.

An answer to (Q) would provide justification for the crucial premise in Roca-Royes' inference pattern like (R1\*–6\*), (R4\*).

(R4\*) S knows that  $a_I$  has categorical property G that is conducive to the possibility, P, of having F (*viz.* to the modal property, P, of possibly being F).

Hence, an answer to (Q) *viz.* a justification for (R4\*), is what creates (tractive) epistemic friction for Roca-Royes' account. While in at least some cases an essentialist answer to (Q) *viz.* an essentialist justification of (R4\*) is *possible*, such an essentialist strategy is not required for the similarity-based account. Indeed, we can distinguish different variants of the similarity-based account, depending on how the crucial premise, (R4\*), is justified. Since an essentialist justification of (R4\*) is possible in some cases, there might be an *essentialist variant* and since, as Roca-Royes herself argues, (R4\*) might have an inductive justification, there is also an *inductivist variant*. We have seen that for the inductivist variant the PMEF extends to the notorious Problem of Induction (PI). I have briefly looked at the Hinge Epistemology Solution (HES) to the PI. With regard to this treatment of the PI, which is the one preferred by Roca-Royes, I was able to warden off a worry as to whether the PMEF even arises on this strategy. I conclude that to the extent to which the HES is a successful solution to the Humean PI, it serves as successful solution to Roca-Royes' PMEF. However, with regard to the HES, I found that (knowledge of or epistemic access to) essence does not play a significant role. This warrants the conclusion that, while there is an *essentialist* variant of Roca-Royes' similarity-based account that might be successful in at least some cases, her preferred *inductivist* variant does not require (knowledge of or epistemic access to) essence to provide modal epistemic friction. However, due to the very narrow scope of modal propositions knowledge of which is supposed to be covered by Roca-Royes' account, this result need only trouble essentialists in the epistemology of modality that subscribe to a specifically strict version of *uniformism*, *i.e.*, the view that all modal knowledge is fundamentally based on only one epistemic source (in this case essences). The result in this paper should neither be too troublesome nor too surprising to *non-uniformist* essentialists.<sup>17</sup>

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<sup>17</sup> I would like to thank the organizers and the audience of the IV<sup>th</sup> *Blasco Disputatio* on the topic *The Epistemology of Modality. Does Modal Knowledge depend on Knowledge of Essence?* in June and July 2022 at the University of Valencia, where some ideas that led to this paper were presented and discussed. Special thanks go to Sònia Roca-Royes for numerous illuminating conversations on the topic and for support in many ways.

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