Rethinking the epistemology of modality for *abstracta*

Abstract. The paper is an exploration of the sort of epistemology available to explain our *de re* modal knowledge about abstract entities. The thesis suggested—in a first approximation to the issue—is somewhat provocative: as modal epistemologists, we don't have much work to do; instead, the work is down to ontologists. The paper first motivates the thesis by relying on a conception of abstract objects that makes the thesis a rather plausible one. It then considers some potential concerns and concludes that, while their treatment imposes some refinements and qualifications, the thesis stands.

Key words: Abstract objects; *de re* modality; essentialism; epistemology of modality; ontology.

1. Background and context: the need for a non-uniform epistemology of modality

One of the theses I want to defend here is somewhat provocative: as modal epistemologists, we don't have much work to do when it comes to explaining our modal knowledge about *abstracta*; instead, the work is down to ontologists. For future reference, I shall call this thesis '(EpAb)'. The provocativeness of (EpAb), however, will diminish substantially once I make explicit the working conception of *abstract object*; one that makes the thesis in fact a very natural one. Before getting into the thesis itself, I shall explain its research antecedents, by way of providing both background and my general picture of the epistemology of modality.

I will be working under the assumption that our epistemology of modality will be different for concrete and for abstract entities. Elsewhere (Roca-Royes 2017) I have sketched my account of a modal epistemology for concrete entities. The account there, inductive in nature, is centred on the notion of similarity and it largely relies on *a posteriori* knowledge. Roughly, the proposal is that we know about some concrete entities' unrealized possibilities by extrapolation from (largely *a posteriori*) knowledge about some other, similar entities' realized possibilities. By the very nature of that account, it can hardly come as a surprise that it is not fit to explain our *de re* modal knowledge of abstract entities; our present focus. Nor do I think that a single account could best explain both types of knowledge. What I think, rather, is that the epistemology of modality must look non-uniform. This is the unifying thesis of (Roca-Royes 2017) and the current paper, and I shall devote this introduction to motivating it and defend it against a potential threat.[1]

Elsewhere, I have studied salient existing epistemologies of modality one finds in the literature and have found them all wanting. They include the views of Chalmers, Kment, Peacocke, Williamson, and Yablo.[2] A feature that has been identified as common to all of

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[1] Research for both (Roca-Royes 2017) and the current paper has been undertaken under the project *Towards a non-uniform epistemology of modality*, funded by an AHRC Leadership Fellowship (Early Career). Bob Fisher (2016) also argues for a non-uniform epistemology for reasons congenial to mine.

[2] See for instance (Roca-Royes 2010, 2011a, 2011b and 2012), where I deal with the views of (Chalmers 2002), (Kment 2006), (Peacocke 1999), (Williamson 2007), and (Yablo 1996).

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them is their dependence upon (or their need for) an epistemology of essence. It is a common trait of these epistemologies that their elucidations of general modal knowledge rest, at some point or other, on (the need for) an elucidation of essentialist knowledge (or, at a minimum, on our capacity for it). Crudely characterized, possibility knowledge is explained as somehow derivative of essentialist knowledge; but essentialist knowledge is not explained or, at any rate, not satisfactorily explained. From this, the fact that they fail at providing a satisfactory epistemology of essence has been diagnosed as a shared deficit.

Parallel to this, I find it important that—as social epistemology recommends—our epistemology of modality be sensitive to an asymmetry, often neglected, between essentialist/necessity claims and basic possibility claims: namely, the widespread disagreement about the former and the widespread agreement about some of the latter like, for instance, that this table can break.[3] Given this situation, we should be cautious when it comes to *relying* on the knowability of essentialist facts as far as explaining our possibility knowledge is concerned.

These two considerations suggest a methodological recipe which (Roca-Royes 2017) is set to follow: namely, to start with the simple cases aiming at explaining them in a way such that success here is not parasitic upon the availability of a satisfactory explanation of the problematic cases. Following this recipe, (Roca-Royes 2017) sketches an epistemology of *de re* modality that manages to explain, without relying on an epistemology of essence, ordinary cases of what Divers (1999) calls *basic* modalizing; that is, modalizing about concrete entities or, as Divers puts it, spatio-temporally located (and unified) entities.

The limits of that epistemology are noted though: it won't be able to explain our knowledge of essential/necessary truths (Roca-Royes 2017, §4) and, as acknowledged above, it is not transferable either to the case of *abstracta*, something largely due to its empiricist grounding elements. *If* we have knowledge about essential/necessary truths at all, and *if* we have modal knowledge about abstract entities, those types of knowledge require a different type of explanation. Non-uniformity follows from this.

Yet, there is a potential theoretical threat to the non-uniformity position. As I left matters in (Roca-Royes 2017), we are still in need of an epistemology of modality for *abstracta* and of an epistemology of essence/necessity (at least about *concreta*). Were any of those missing, complementary stories generalizable enough, the door would be back open (the thought might go) for a uniform epistemology of modality.

This threat is vividly pressing in view of (Hale 2013). And the fact that I feel very attracted by many aspects of Hale's epistemology of modality (and of essence) threatens also the coherence of my overall position. There, Hale sketches an epistemology of modality that differs in important respects from any of those mentioned above and that is, nevertheless, like those above, essence-based; very explicitly so in his case. A parallel aim of this paper is thus to engage with his views at dialectically pertinent places; initially, to unfold the reasons why Hale's views do not in fact threaten my overall epistemology (my first Hale-related aim) and, subsequently, to identify the portions of

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[3] Not all possibility claims are equally widely peer-agreed. This is partly a consequence of the widespread disagreement about some essentialist claims. For disagreement over whether biological origins are essential to living entities translates into disagreement over whether I *could* have had different parents.

his epistemology that I would like to adopt (my second Hale-related aim).

Hale's modal epistemology fits nicely with (or is "strongly suggested" by) his *essentialist theory of necessity*; a metaphysical view. According to the essentialist theory of necessity, "metaphysical necessities have their source in the natures [essences] of things, and metaphysical possibilities are those left open by the natures of things" (Hale 2013, 253). The epistemology that, according to him, is strongly suggested by this metaphysical picture is, in his own terms, *an asymmetric necessity first* epistemology; which, as we shall see, is also an *essence first epistemology*. Roughly, there is a base class of known *necessities* and all other modal knowledge (of necessities and possibilities) ultimately depends on our knowledge of those. In turn, "one might expect an explanation of how we can have knowledge of the *nature* or *essence* of things to play a fundamental and central part in explaining knowledge of necessity" (Hale 2013, 254). In sum, Hale's account takes Fine's ontological priority order—of necessities as grounded in essences—and offers the corresponding priorities at an epistemological level. In epistemic-priority order, we first have knowledge of essence, then of necessities, and then of possibilities. In my terms, therefore, Hale's epistemology proceeds overtly in confrontation with the methodological recommendation I believe we should all be following; according to which, and because knowledge of essence is more problematic than (basic) knowledge of possibilities, we should be starting with more basic knowledge of possibilities.

I shall achieve my first Hale-related aim here. To do so, I note that (Roca-Royes 2017) already anticipates, and deals (in general terms) with, the threat that any one such epistemology poses to my overall epistemology of modality. To apply a summary of it to Hale's case: I do not need to take a view on the persuasiveness of Hale's explanation of our knowledge of essence (and of necessities).[4] Suppose the account gets that explanation right. And suppose that, as suggested, our essentialist knowledge enables enough knowledge of necessities (involving both *abstracta* and *concreta*) for us to be able to mount, on that knowledge, a (moderate) necessity-first account of modal knowledge. The problem would be this: if all our possibility knowledge were so dependent upon (a sufficiently strong class of) necessity knowledge, our (rational) degree of confidence in the ordinary possibility facts about concrete entities would need to be upper-bounded by our degree of confidence in the necessity/essentialist facts (about them) in a way that it is not. The extent to which I can rationally doubt that I am essentially human is higher than the extent to which I can rationally doubt that my arm can break. The asymmetry mentioned above reflects these different degrees of confidence and is in itself sufficient to cast doubts on any epistemology that—like Hale's—does not respect those different degrees.

In sum, and by way of stressing a fact that will be relevant when dealing with the second Hale-related aim: even if Hale (2013) provided a persuasive explanation of essential/necessity knowledge, it cannot be one on which to mount (in a uniformity-aspiring fashion) an explanation of (ordinary) possibility knowledge (about *concreta*).

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[4] I am persuaded by many aspects of his explanations. I like, for instance and in particular, how explicit Hale is about our route to essentialist knowledge (about concrete entities) *having to be* abductive. For reasons I cannot expand on here, however, I am suspicious about his own suggested abductive route. But whether my suspicions are on the right track or not, his story about knowledge of essence is a detachable (self-standing) part of his broader asymmetric epistemological project.

More than this, what follows in this paper is compatible with—and arguably congenial to—Hale's views on the epistemology of modality for abstract entities. For it will emerge from what is to be developed here that essentialist knowledge about abstract entities is more readily available than it is about concrete entities. And to the extent that in the case of *abstracta* we don't find the corresponding asymmetry we noted in the case of concrete objects, the door is open for an essentialist/necessity-first account concerning *only* abstract objects.

For reasons that will be made clear in due course, the first step towards (EpAb) is to explore available views on the priority relation between knowledge of essence and knowledge of existence (§2). By making explicit (and endorsing as a working hypothesis) a conception of *abstract entities* that is not in turn tenable for concrete entities, §3 argues for a similarly non-uniform view on that priority relation. At this point in the dialectic, I will be able to make a bold case for (EpAb) very briefly (§4). In §5 I refine the bold case, and (EpAb) itself, in view of some urgent (yet not fatal) concerns.

2. Epistemic existentialism and epistemic essentialism

Anand Vaidya (2015) has conveniently labelled with 'epistemic essentialism' and 'epistemic existentialism' two positions that have been at the centre of Lowe's metaphysics and epistemology of modality:

Epistemic Essentialism (EEs):
Knowledge of (x's) essence must precede knowledge of (x's) existence.

Epistemic Existentialism (EEx):
Knowledge of (x's) existence must precede knowledge of (x's) essence.

Lowe endorses (EEs), which he motivates on the basis of, among other things, the following transcendental reasoning (where 'knowing what X is' means the same as 'knowing X's essence'):

[w]e can in general know the essence of something X antecedently to knowing whether or not X exists. Otherwise, it seems to me, we could never find out that something exists. For how could we find out that something, X, exists before knowing what X is—before knowing, that is, what it is whose existence we have supposedly discovered? (Lowe 2008: 40)[5]

I shall argue here that neither (EEs) nor (EEx) are true. Yet, a case can be made that, by separating the cases of different types of knowledge, there are true (restricted) theses in their vicinity. To motivate the disambiguation(s) I am after, let me provide two sharply contrasting examples that pull in opposite directions and that differ, crucially, on the way the relevant *x* is being singled out in thought on each occasion.

First, an entity can be singled out (in thought) by means of a *material* demonstration. For instance, my (singular) thought can successfully latch on a particular cow by saying *that cow* while (materially) pointing to the cow that is closest to me in a dairy farm. Let us call the cow at issue 'Cowy'. It will take a lot—in terms of theoretical sacrifices—to

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[5] Although Lowe does not always make explicit (or clear) the intended modal force of his theses, the fact that he motivates (EEs) by means of such transcendental reasoning leaves little room for doubting that the modal force in Vaidya's formulations of (EEs) and (EEx) is (exegetically) correct; so the modal force is not there just to contribute to philosophical interest.

deny that I can think *of* Cowy that *that cow exists*. Even if only because of the (actual) world's cooperation, my thought succeeds in being about Cowy. And it will also take a lot to deny that, given my evidence, I can know that *that cow exists*. The same holds if I were to introduce 'Cowy', in that scenario, as a name for *that* (materially demonstrated) *cow*. That I can know of Cowy—while singled out in thought either by means of *that cow* or by means of (that) *Cowy*[6]—that she exists is compatible with my ignorance as to what the essences of cows are. Once I have Cowy-thoughts (in the form of *that-cow*-thoughts or *Cowy*-thoughts), I can *then* wonder about *her* essence.[7] This example is submitted here as *a* way—set aside for now whether a *persuasive* one or not—of motivating the following instance of (EEx):

(1) Knowledge of Cowy's existence must precede knowledge of Cowy's essence.

As anticipated above, (1) needs to be amended before we can claim to be in front of a true claim. So let me turn to the sharply contrasting example and then reflect on what this contrast teaches us in relation to what the required amendment is.

Suppose that Cowy, who exists but I (in this second example) have never seen, originates from cow-sperm *s* and cow-egg *e*, and suppose that it is essential to her that she originates from *s* and *e*. Checking some records of the dairy farm, I come to know that the lab-scientists fertilized a given cow-egg with a given cow-sperm in an attempt to get an extraordinarily productive milk-cow, and that the records refer to that sperm and egg-cell as, respectively, *s* and *e*. Me being a modal metaphysician, I also believe (truly, by supposition, and, let us also assume, knowledgeably) that sperm-and-egg origins are essential to cows. Thinking of Cowy as the entity that (actually) instantiates the property of *essentially originating from s and e*, I single out Cowy in thought by means of the *non-material, essential-pointing* '*that cow*', and wonder whether *that cow* exists; that is, I wonder something very much in the vicinity of wondering whether the fertilized egg, the zygote, successfully developed into an adult cow-organism-with-those-essential-origins (something, to continue developing the thought experiment, the dairy records don't tell me). If I were to introduce 'Cowy' as a name for Cowy while she's being singled out in thought in this way, the semantic felicitousness of 'Cowy' would be hostage to there being (exactly) one instance of the property *essentially originating from s and e*, and the singular concept *Cowy* so introduced would be parasitic upon the non-material essential-pointing. (If there had been *that* naming act, what I am—in the example—wondering about could equally be put in terms of *whether Cowy exists*, as the singular concept *Cowy* in this example would be essentially loaded[8]). The label 'non-material essential-pointing' is to capture the thought that the pointing is both non-material and done by means of *the (presumed) essentiality of* a relation; a relation that in the current

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[6] '(that) *Cowy*', not '*(that) Cowy*'. What I mean here is *Cowy*, that singular concept—a conceptual correlate of a singular term—that has been introduced parasitically on a material demonstration.

[7] It is orthogonal to the example that Cowy is presented in thought as a cow. She need not. What is relevant to the example is that I *can* single out that entity in thought prior to having any thoughts about her essential properties. Thanks to Tuomas Tahko for pressing me on this.

[8] That is, its associated conception would require its reference to have a certain essentialist profile.

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example, by assumption, *is* an essential one.[9,10] This example goes some distance to motivate the following instance of (EEs):

(2) Knowledge of Cowy's essence must precede knowledge of Cowy existence.

(1) and (2) are incompatible. Yet, the belief that there is something correct their motivating thought-experiments are onto survives the acknowledgment of their incompatibility. What we ought to do is to amend them—better: disambiguate them—in a way such that the resulting claims not only are not incompatible but are also true to what (1) and (2) are trying to capture.

I suggest we do so by relativizing (1) and (2) to the respective modes of thinking about (or of singling out) Cowy. I shall use 'material-demonstrative knowledge' (about *x*) to refer to knowledge (about *x*) that is enabled by a material demonstration of *x*. And I shall use 'essential-pointing knowledge' (about *x*) to refer to knowledge (about *x*) that is enabled by a (non-material) essential-pointing of *x* in the sense specified above.[11] With this terminology in mind, we can restrict (1) and (2) as follows:

(1') Material-demonstrative knowledge of Cowy's existence must precede material-demonstrative knowledge of Cowy's essence.

(2') Essential-pointing knowledge of Cowy's essence must precede essential-pointing knowledge of Cowy's existence.

I submit (1') and (2') as plausible theses. So are the following (EEs') and (EEx') they are instances of:

(EEx') Material-demonstrative knowledge of x's existence must precede material-demonstrative knowledge of x's essence.

(EEs') Essential-pointing knowledge of x's essence must precede essential-pointing knowledge of x's existence.

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[9] Not all non-material pointings need be essential. For instance, I can single out number 2 in thought by *the number of my children* and think of it that *that number is even*. More than this: even if I had non-materially pointed to number two by means of *the immediate successor of number one*, that would still not count as (non-material) essential pointing. Non-material, essential-pointings make explicit *the* (presumed) *essentiality of* the relation they make reference to. Compared to their non-essential counterparts, therefore, essential-pointings run a higher risk of being semantically infelicitous, for they—but not their non-essential counterparts—will fail to refer if the presumption of essentiality is not correct. So, if *Cowy* is introduced as *the cow that essentially φ's*, then, even if there is *the* cow that φ's, there is no Cowy if that cow doesn't *essentially* φ.

[10] Non-material essential pointings and, more generally, non-material pointings, also presuppose uniqueness; namely, that there is one and only one entity that (essentially) φ's. Because of this, a singular concept (or a concept introduced/forged with the intention that it be so) can also fail to refer—in addition to the reasons in the previous footnote—if this presupposition is not correct. Thanks to an anonymous referee for pressing me to clarify this.

[11] As illustrated above in the main text, the semantic value of a singular concept might be parasitic upon a material demonstration. If *Socrates* is one such singular concept, my knowledge that *Socrates is a philosopher* is, following the above terminology, material demonstrative knowledge, even if my thought is not (overtly) demonstrative. The analogous comment applies to singular concepts that are parasitic upon non-material essential-pointings.

More than this: because each of them relates existential and essential knowledge *of the same type*, they are rather trivial theses. I have not found less trivial theses in the vicinity of (EEx) and (EEs) that would at once have their necessity force and still be true.[12]

3. *Concreta* vs. *abstracta*

Theses (EEx') and (EEs') establish priority orders between types of ontological knowledge and types of essentialist knowledge. As far as material-demonstrative knowledge is concerned, ontological knowledge is prior to essentialist knowledge. And it is the other way around with essential-pointing knowledge. Part of the interest in these theses lies in the fact that they are explanatory of our current situation with respect to our modal and ontological knowledge; or, at a minimum, they are illuminative of that situation. To anticipate: (EEx') partly explains our situation with respect to knowledge about concrete entities whereas (EEs') does so with respect to our knowledge about abstract entities. Motivating this—something I shall do in the course of this and the next sections—will be crucial to, in turn, motivate (EpAb); as well as to strengthen the case for the non-uniformity thesis.

The illuminative power of (EEx'). According to (EEx') it cannot happen that, for a given *x*, we have material-demonstrative knowledge about *x*'s essence without material-demonstrative knowledge about *x*'s existence. It can happen, however, that we have (material-demonstrative) existential knowledge about *x* compatibly with lacking (material-demonstrative) knowledge about *x*'s essential facts. A case can be made that our world (and current time) actualises that possibility. That being so, the priority order stated in (EEx') is explanatory (or at least illuminative) of that actualisation. The case can be made briefly: I take it as uncontroversial that, for many entities (among those that are capable of material demonstration), we have material-demonstrative knowledge of their existence. In §1, I noted an asymmetry between the distribution of peer-agreements and peer-disagreements about, on the one hand, ordinary possibility claims and, on the other, essentialist/necessity claims. There is an analogous asymmetry which involves existence claims in the place of ordinary possibility claims: when *x* is singled out material-demonstratively, the (long-noted) widespread peer-disagreement about *x*'s necessary/essential facts contrasts with the widespread peer-agreement that *x* exists. From a social-epistemological perspective, many will take this distribution of peer-agreements and disagreements as casting doubts *only* about our knowledge of necessities and essential facts (the doubts being grounded in that reliable methods of inquiry would not make us disagree so widely). Whether we (or some of us) are or are not in possession of knowledge of such facts is something we don't need to take a view on; that is, we don't need to decide how strong the recommended doubts are to be. It suffices for current purposes that the actual (and current) situation is one of two: either we have (material-demonstrative) existential and essential/necessity knowledge about concrete entities or we only have (material-demonstrative) existential knowledge. (EEx') is explanatory of this.[13]

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[12] The distinction here is very congenial to that in (Sgaravatti 2016). Certainly, and for illustration, material-demonstrative knowledge renders (EEs') very implausible. As Sgaravatti says "one can distinguish Tom [in thought] from other living beings by features which are not essential to him: for example, being in front of me right now" (Sgaravatti 2016, 221).

[13] For clarification: our material-demonstrative knowledge need not be direct; it suffices to be part of a suitable causal-historical chain. The less direct our material demonstrative knowledge

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The illuminative power of (EEs'). According to (EEs') it cannot happen that, for a given *x*, we have essential-pointing knowledge about *x*'s existence without the same kind of knowledge about *x*'s essence. To motivate the current case will be lengthier; and, as anticipated, the case will unfold from now and until the end of §4. Part of the reasons why this case is more complex is that, in the current case, the relevant disjunction is also more complex. To anticipate it: either we don't have (essential-pointing) knowledge about *x* at all or, if we have (essential-pointing) knowledge about *x*'s existence, then we also have (essential-pointing) essentialist knowledge. (EEs') is explanatory of that disjunction. It is unfolding the reasons *why* we are (necessarily) in such a world that will take some time. (The case will also make it clear why I am not in a position to say anything stronger than that.[14])

Let me then start unfolding the case. To begin with, I need—without dialectical damage—to relax slightly the notions of *essential-pointing knowledge/thinking*. For above—for vividness—I chose sharply contrasting Cowy-thought-experiments, the result being that it is less clear (than a case can be made) that we have essential-pointing thought (let alone essential-pointing knowledge) about entities. A crucial parameter of (potentially required) relaxation revolves around whether *the essentiality of* the essential features which contribute to reference-fixing make it—as in the Cowy-example above—*into* the singular concept at issue or whether it rather belongs to an associated conception of its reference.[15] I do not need to foreclose the possibility of essentially-loaded singular concepts; nor do I need, however, to make the discussion rest on their existence. Stipulatively, I shall use 'essential-pointing knowledge/thought' (and cognates) for essentially loaded thought (and knowledge) about entities so (relaxedly) understood.

With this relaxation in mind, the following contrast is crucial to building the current case. I take it as uncontroversial that, while most of our *de re* existential knowledge concerning concrete entities involves (whether directly or derivatively) a material demonstration, we *cannot* think material-demonstratively of abstract entities, let alone acquire material-demonstrative knowledge that a certain abstract object exists. It is not automatic that, *therefore*, in the case of *abstracta*, we cannot but think in an *essential*-pointing manner; even after that notion has been relaxed as above.[16] For our purposes, it is sufficient, however, that it be true that, as the remaining of this section motivates, we do think in an essential-pointing manner about *abstracta*.

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is, however, the more room for doubt about existence. Thanks to Jessica Leech for pressing me to clarify this.

[14] And yet, as I expect the discussion to show, the logical weakness of what I am in a position to say does not amount to the claim being trivial.

[15] The contrast here is that between the following singular concept for number 2: *the number that is essentially the immediate successor of the number 1*, and this other concept for the same entity <u>when governed by</u> a conception of numbers according to which successor-facts are essential to them: *the immediate successor of the number 1*.

[16] See footnote 9 for (at least *prima facie*) reasons against *the immediateness* of such a step. It might still be true that we cannot but think essential-pointingly about abstracta. For reasons that will be clearer in §5.4, I read Hale and Wright (2009) as providing a (non-theory-independent) case for this.

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Bracketing existence concerns for the time being, there are different views of what abstract objects are. Those different views seem nonetheless to converge on a conception about their essentialist profiles. How the agreement is *shown* verbally depends on the interlocutors' theories of abstract objects. But we can follow Yablo—a fictionalist!—in expressing the agreed fact, in a sufficiently theory-neutral way, in terms of the intrinsic character and the intra-realm relations being essential to abstract objects:

> Accense [the accidental properties] dwarfs essence for just about any old object you care to mention: mountain, donkey, cell phone, or what have you.
>
> Any old concrete object, I mean. Abstract objects, especially pure abstracta like 11 and the empty set, are a different story. I do not know what the intrinsic properties of the empty set are, but odds are that they are mostly essential. Pure sets are not the kind of thing we expect to go through intrinsic change between one world and another. Likewise integers, reals, functions on these, and so on.
>
> The pattern repeats itself when we turn to relational properties. My relations to other concrete objects are almost all accidental. But the number 11's relations to other abstract objects (especially other numbers) would seem to be essential. (Yablo 2002, 220)

In a less theory-neutral manner, Zalta expresses roughly the same fact when commenting on Mally:

> The intuition here is that the properties determining an abstract object are part of its nature and govern the conception of that object. Indeed, for Mally, there is nothing more to the nature of an abstract object than the properties *by which it is to be conceived*. In what follows, we shall say that an abstract object *encodes* property F instead of saying that F determines x. (Zalta 2006, 663)

> By claiming that $\emptyset_{ZF}$'s encoded properties are its essential properties, we are claiming that its mathematical properties are the only ones that are constitutive of its nature as an object. (Zalta 2006, 686)

Much in the spirit of Zalta and Mally, the abstractionist's *abstracta*—entities singular concepts for which are forged via abstraction principles[17]—are entities with no hidden nature. Instead, the implicit definition of the general and singular concepts that are forged by means of abstraction captures the essences of the abstract objects that are being referred to by those singular concepts, therefore making the essences of abstract entities accessible to the possessors of abstraction-forged concepts. More generally, knowledge of meaning can mediate our acquisition of knowledge of essence even when no (non-circular) definition is to be had. As Hale puts it:

> Meanings of words and the natures of the things for which they stand may be closely linked, not only when the meanings of relevant words cannot be given by explicit definition but only by some form of implicit definition, but also when no definition of any kind can be provided. (Hale 2013, 256)

In relation to the relaxation above, there is an issue—which I shall not attempt to settle within the scope of this paper—as to which (if any) of these conceptions of abstract

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[17] See for instance (Hale and Wright 2001).

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objects require essentially loaded singular concepts. To motivate that we think of abstract entities in an essential-pointing manner (in the relaxed sense specified above), however, it suffices to recognize, and to appropriately generalize the fact, that, on any of the three conceptions above, the following seems to hold:

> An immediate successor of the number one that (even if *per impossibile*) was not *essentially* an immediate successor of the number one would not be the number two.

Nothing analogous holds for our usual ways of thinking about concrete entities.

So far, of the case I am building, we have got the following: our world actualises essential-pointing *thought* about *abstracta*. We are still some distance away from motivating the disjunction that either we don't have (essential-pointing) *knowledge* at all or, if we have (essential-pointing) existential knowledge about *x*'s existence, then we also have (essential-pointing) essentialist knowledge.

4. Ontology as epistemology of modality for abstracta

If it is part of our *conception* of abstract objects that their intrinsic character and intra-realm relations are essential to them, questions about the existence of abstract objects are not significantly different from questions about whether abstract objects *with such-and-such essentialist profile* exist. Again, the situation is different with our usual ways of thinking of concrete objects. In view of this, consider the following two pairs of conditionals with existence claims in their antecedents and attribution of essential properties (to the intended entity in question) in their consequents:

> (3) Socrates exists → He is essentially human
> (4) Socrates exists → His origins are essential
>
> (5) The number two exists → It is essentially a number
> (6) The number two exists → It is essentially the immediate successor of the number one

While, in the case of (3) and (4), the whole conditional is epistemically more demanding than its antecedent, it is the other way around with conditionals (5) and (6). (This is so because, to put it in terms of §2, conditionals (3) and (4) involve—and are to be taken as involving—material-demonstrative thinking whereas (5) and (6) involve essential-pointing thinking.) This being so, it should not come as a surprise that, as far as *de re* modality of *abstract* objects is concerned, our task as modal epistemologists is not particularly significant. Instead, the most interesting action will take place, as we shall see in this section (and as is suggested by the higher controversy of the antecedents of (5) and (6)), within the domain of ontology.

Do we *know* that the number two is essentially a number? Arguably, there is no essentialist knowledge about the number two without the number two. This is so if knowledge requires truth and essentialism requires the bearers of essential properties. The request for an explanation of *how we know* that the number two is essentially a number thus presupposes the existence of that piece of knowledge. When that knowledge [18] requires the existence of the number two and when, in addition,

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[18] Or, to qualify (annoyingly but for the sake or rigor): 'when the piece of (at least epistemically metaphysically) possible knowledge'.

conditional (5) is uncontroversial, something like (what is expressed by) '*by the number two existing*' will, therefore, be the most interesting (and demanding) part of a satisfactory answer. (Analogous remarks apply, even if less vividly so, in the case of a question about *how we can know*.)

Importantly, I am not taking existential knowledge of abstract objects as required for essentialist knowledge of abstract objects; I am rather requiring existential *facts*. So, (among other things) I am not suggesting that our route to knowledge that *the number two is essentially a number* is by modus ponens on (5). This is why, in the first instance at least, (EpAb) is not about the epistemology of ontology, but rather about ontology itself; (EpAb) says that ontology is the most demanding part of our epistemology of modality about abstract entities. In other words: essential-pointing knowledge that the number two is essentially a number can be seen as supervening upon (competent) essential-pointing *thought* that the number two is essentially a number plus the existence of the number two.

With a view to drawing together the case for the explanatory interest of (EEx'), the following three conditionals are salient:

(A) If there are not abstract entities, the engendered answer to *how do we have (essential-pointing) essentialist knowledge about them* is to deny the presupposition in that question: we do not have (essential-pointing) essentialist knowledge about "them".[19]

(B) If there are abstract entities, the engendered explanation to *how do we have (essential-pointing) essentialist knowledge about them* will appeal to the fact that they exist and the fact that we think (competently) in an essential-pointing manner about them.

On (B): essential-pointing essentialist knowledge about abstract entities is, on this view, compatible with a lack of essential-pointing existential knowledge about them, but not the other way around. It follows from here that:

(C) If we have essential-pointing *existential* knowledge about *abstracta*, we also have essential-pointing *essentialist* knowledge about them.

Conditional (C), and the reasonings that led to it, reflects (and accommodates) the fact that the antecedents of conditionals like (5) and (6) are more demanding, epistemically, than the whole conditionals. I have been taking this fact as a desideratum.

Either there are or there are not abstract entities. Together with conditionals (A)-(C), therefore, we have already walked the distance we needed to get to the desired disjunction, at least as far as abstract entities are concerned: either we don't have (essential-pointing) knowledge about *x* at all or, if we have (essential-pointing) existential knowledge about *x*'s existence, then we also have (essential-pointing) essentialist/necessity knowledge.

(I will generalise this disjunction beyond the case of *abstracta* in §5.4. For the time being, the disjunction so restricted suffices for current purposes. And, to stress the contrast from §3, let me note that nothing like this holds in the case of essentialist

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[19] This answer is compatible with fictionalism and other non-realist treatments of *mathematical* knowledge and mathematical *truth*. I am only committing here to the claim that *essentialist* truth requires objects bearing properties essentially.

knowledge about concrete entities *while being singled out in thought material-demonstratively*. How do we know that Socrates, while singled out that way, is essentially human? Here, relevantly, the controversy of conditional (3), and the lack of controversy around its antecedent, blocks the analogous treatment.)

5. Refinements and qualifications

I have thus far concluded the bold case for (EpAb). In this section, I address some urgent issues whose treatment will amount to refinements and qualifications of some of the statements made in the preceding sections. I do so by focusing on the four issues I find in most urgent need of being addressed.

5.1. The epistemology of modality about abstracta
I have so far been concerned about *essentialist* knowledge about abstract entities and yet the paper is announced as focused on the epistemology of *modality* about them. While there's a recommended use of 'epistemology of modality' that subsumes the epistemology of essential facts, I cannot, while aiming at comprehensiveness, leave things here. What can I say about our knowledge of necessities and possibilities about *abstracta*?

   To a first approximation, and *only* as far as *abstracta* are concerned, I am tempted—as I anticipated earlier—by Hale's asymmetric *necessity-first* approach (2013), succinctly summarised here:

> [G]iven that the metaphysical possibilities are just those possibilities which are left open by the natures of things, and so are determined by the metaphysical necessities, one might expect an essentialist explanation of modal knowledge to follow a necessity-first approach, treating at least some knowledge of necessity as prior to any knowledge of possibility. And second, given that metaphysical necessity is seen as having its source or ground in facts about the natures of things, one might expect an explanation of how we can have knowledge of the nature or essence of things to play a fundamental and central part in explaining knowledge of necessity. (Hale 2013, 254)

To make explicit my second Hale-related aim, therefore: I adopt Hale's views on the *structure* of our body of modal/essentialist knowledge, but only as far as abstract objects are concern. I don't think—for the reasons given in §1—that an asymmetric necessity/essence-first approach is plausible across the board. But my reasons for thinking so stemmed from reflecting on concrete entities. To recall a crucial output of those reflections: as far as *concreta* are concerned, there's an asymmetry between our beliefs about ordinary possibilities and our beliefs about essentialist/necessary facts that makes it implausible that the former rest on the latter. For reasons that should be clear after §§3-4, I don't think that those reflections apply in the case of abstract entities. Quite on the contrary, what has been developed in those two sections go very nicely with an epistemology of modality for *abstracta* that mirrors—as he intends—Hale's *essentialist theory of metaphysical necessity* at the metaphysical level; that is—as summarised in the quotation above—with an epistemology of modality that grants priority to essentialist knowledge and then mounts an asymmetric necessity-first account on that (essentialist) knowledge.

I am cautiously presenting these remarks as a first approximation. The fact that the scope of one such epistemology will be restricted to abstract entities together with the fact that there are hybrid modal statements involving both concrete and abstract entities calls for care. One might be tempted to say, exploiting Hale's remarks above—to recall: that "the metaphysical possibilities are just those possibilities which are left open by the natures of things"—that anything that is not precluded by the nature of abstract entities (but that involves them) is a metaphysical possibility. But that would surely be too hasty. That 3,567 numbers the planets in our solar system might be impossible for reasons other than the natures of the abstract entities; it might be down to the nature of the material realm.

The overall epistemology of modality I am submitting is non-uniform and it separates the case of abstract entities from that of concrete ones. Hybrid modal statements certainly generate noise. A natural reaction—my reaction at any rate—is to first restrict the scope of the asymmetric epistemology endorsed in this subsection to *non-hybrid* modal facts about abstract objects and to then, as a subsequent step, say something (only potentially different) about the hybrid claims. This is my methodology, and thus I turn now to the subsequent step.[20]

5.2. The epistemology of hybrid modal facts

An in-depth exploration of the hybrid cases would require more space than I have available. But we can still approximate the issue by formulating working hypotheses and running them through some case studies (to be subjected to further scrutiny). A preliminary question whose answer is already substantial is how many (types of) cases we should distinguish here. I want to distinguish between two cases whose contrast is epistemically significant: *crossing-cases* and *non-crossing* cases. (The *rationale* behind this labelling will become clear as I unfold the cases). I take them in turn.

Crossing-cases. It follows from the above conception of abstract objects that I cannot bump into the number seven, that Julius Caesar cannot be (is necessarily distinct from) the number two, that Frege cannot marry Anna Karenina, and other such facts.[21] What brings together these cases as an epistemically salient class of hybrid modal facts is the following. The truth of the associated possibility claim of each of these facts[22] would require an entity to cross (in one of two directions) what is *known to be* an impermeable boundary; namely, that between the abstract and the non-abstract. To motivate the *crossing-requirement*: a world in which I bump into the number seven requires the non-abstractness of the number seven; a world where Julius Caesar is the number two requires either that they both be abstract or that they both be non-abstract; and a world where Frege marries Anna Karenina requires the latter as non-abstract.[23] All these are

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[20] This *first-reaction restriction* applies as well to the epistemology of modality for concrete entities sketched in (Roca-Royes 2017). I left it implicit there because not enough stock had been accumulated by the end of that paper to start dealing with the issue.

[21] The discussion in this subsection assumes some version of realism (artifactualist or not) about fictional entities. This assumption is not essential and is relaxed in §5.3. Thanks to an anonymous referee for pressing me on this.

[22] For illustration, respectively: 'I could bump into the number seven', 'Julius Caesar could be number two', and 'Frege could marry Anna Karenina'.

[23] In this latter case, I require them both to be concrete because I take it that *marrying* requires (at a minimum) human beings as *relata*. If one makes Frege abstract by making him a fictional character while keeping Anna Karenina as a fictional character too, they cannot marry; two

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impossibilities if the impermeability thesis is true. To argue for *impermeability*: the impossibility of crossing from abstractness to non-abstractness follows directly from the above conception of abstract objects: abstract objects are essentially abstract. And non-abstract objects are (arguably) necessarily non-abstract: if Julius Caesar could have been abstract, there is a world (different from the actual one) relative to which he is abstract and yet contingently so (witness of *that* contingency: the actual world).[24] This suggests the following hypothesis: the epistemology of hybrid necessities and impossibilities *that fall under the crossing-type* should be assimilated to that of the epistemology of non-hybrid modal facts about *abstracta*. The suggestion is that our knowledge that abstract entities are essentially abstract plays the largest role in explaining our knowledge (whenever we have it) about the truth-value of hybrid modal claims under the *crossing* category.[25]

Non-crossing cases. Things are otherwise with this second type of case. Examples here will be very varied in nature; from that *I could love the number two*[26] to the planets example above. That *I could love the number two* is a non-crossing case on the basis of the fact that the obtaining of that possibility does not require me (or the number two) to cross the abstract/non-abstract boundary. Some non-crossing cases might be contingencies, some might be necessities, and some might be impossibilities. To anticipate, the hypothesis to be motivated next is that the epistemology of hybrid *non-crossing* modal facts should be assimilated to that of the epistemology of modality about concrete entities. As starting (explanandum) data, I shall note that our degree of confidence about the hybrid non-crossing cases might come in *significantly* different degrees[27] and our degree of confidence about a given claim in this class can easily be less than our degree of confidence about the non-hybrid *abstracta* cases and the (hybrid) crossing ones. (I am, for instance, much more confident that I could love the number two than I am that the number 3,567 could number the planets in our solar system. And I am

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fictional characters cannot marry. This is compatible with it being true that, according to some (possible) fiction, they marry.

[24] The parenthetical 'arguably' is there out of cautiousness, for the reasoning above assumes a suitably strong modal logic (one where, at a minimum, the accessibility relation is symmetric).

[25] Nothing here goes against the Necessitist claim that concrete objects are contingently non-concrete. For the Necessitist categories of *abstract* and *contingently concrete or contingently non-concrete* are impermeable. This has always been so for Williamson (see for instance (Williamson 2010)), and it is so as well according to later statements of Linsky and Zalta's Necessitist position (see for instance (Linsky and Zalta 1996) and (Zalta 2006)), even if not so in (Linsky and Zalta 1994).

[26] Instead of actually hating it for being the only even number among the otherwise wonderful collection of primes.

[27] I do not mean to deny by this that our confidence about hybrid *crossing* or about *non-hybrid abstracta* cases cannot come in different degrees of confidence. The 'significantly' there is to capture, nonetheless, the following asymmetry: in the *hybrid non-crossing* cases the source of the different degree of confidence is more likely to be of non-modal nature, whereas in the *hybrid crossing* and the *non-hybrid abstracta* cases, the source can easily be of modal nature. The following illustrates the asymmetry. On the one hand, I am more confident that *necessarily two plus two equals four* than I am that *necessarily Goldbach's Conjecture is true*, but this difference is a directly proportionate reflection of my different levels of confidence of their non-modal matrices. On the other hand, I am more confident that *I could love the number two* than I am that *3,567 could number the planets in our solar system*, and the source of these different degrees of confidence is distinctively down to the modal element: I *equally* believe that their non-modal matrices are false.

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more confident that the number two is necessarily a number and necessarily distinct from Julius Caesar than I am of any of those non-crossing modal facts.)

(Roca-Royes 2017, 234-235) highlights that our (non-hybrid) possibility beliefs about concrete entities can also come in (significantly) different degrees of confidence and offers a tentative explanation why this is so. This is not the place for me to reproduce in any detail the gestured explanation, and the following should currently suffice: when $\varphi(x)$ is not known to be true (either because it is false, or true and unknown), our degree of confidence that $\Diamond\varphi(x)$ will depend on our degree of confidence that x is *relevantly* similar—in (Roca-Royes 2017)'s technical sense—to a given y which we know to have actualised φ. I contend that the best explanation *why* we find an analogous behaviour in confidence-distribution in the hybrid, non-crossing cases is that our beliefs in them are grounded in our knowledge of the concrete—rather than the abstract—entities involved (or, perhaps more accurately: of the concrete entities that are, on each occasion, relevantly similar to the concrete entities involved). For instance, that *I* (and human beings in general) have survived changes in love and hate relations irrespective of the nature (abstract *vs.* concrete) of the objects of love or hate constitutes my grounds for believing that I could love the number two (i.e., it is grounded in my reasons for believing that *I* could survive a change in the objects of my love).

To summarise this subsection: as a working hypothesis, the epistemology of hybrid modal facts will itself be non-uniform. The above constitutes the motivational grounds for this hypothesis. The task of scrutinizing it (beyond its grounds) is left for a future occasion.

5.3. The conception of abstract objects

The claim that our conception of abstract objects includes the idea that their intrinsic character and intra-realm relational character is essential to them—hereof the *essentialist conception* (of *abstracta*)—is a bold claim also in need of scrutinising. I shall focus on a worry that emerges from considering that the essentialist conception might not be universally correct, to then focus on assessing how damaging that would be for my purposes.

The plausibility of the immutability, across worlds, of the abstract *realm* (i.e., of the necessity of the facts *fully* within its boundaries) might vary depending on the kind of abstract objects on which one focuses one's attention to when assessing the claim. For instance, the plausibility might vary depending on whether we focus on pure sets or on works of art. In an attempt to postpone the emergence of this concern, the above discussion has been motivated by focusing only on mathematical entities, and this made my life above easier, as these are entities for which, I am assuming, (a suitably restricted version of) the *immutability thesis* (so to call it) is exceedingly plausible. But things might be otherwise when it comes to, for instance, fictional entities. Accordingly, one might worry that, even granting that, for instance, it is part of (the fictional entity) Sherlock Holmes's character to live in Baker Street, it is not obvious that such a property is essential to it (the fictional entity). If that is not obvious, the *essentialist conception* does not apply to Sherlock Holmes.[28] The objection to be mounted on these bases is that

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[28] Another way in which the immutability of the abstract realm might be challenged is via *artifactual theories* about abstract objects. As Everett (2013) highlights, according to them, fictional entities come contingently into existence. It is to be noted, however, that *artifactual*

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the above discussion is unacceptably incomplete in that it does nothing to address our modal/essentialist knowledge about entities such as Sherlock Holmes. In response, I want to acknowledge the potential threat but, at the same time, narrow its impact vis-à-vis my overall project.

First, the possibilities of theory-neutrality are limited. I have thus far remained as neutral as possible on the metaphysics (and even existence) of abstract entities such that the achieved degree of neutrality would still allow me to say something (resultantly) substantial about the epistemology of *abstracta*. Working under the hypothesis of the *essentialist conception* has been my way of compromising between neutrality and lack of substantiality. Unavoidably, the above discussion will be much more compelling to those who—like me, I must confess—feel inclined towards the *essentialist conception* than to those who do not. How dialectically damaging is this? Not very, I contend. For I take it that the denial of the *essentialist conception* is not plausible across the abstract realm. Indeed, I take it that, as far as entities like numbers, pure sets, and functions (on numbers) are concerned, most of us would recognize ourselves in the position that Yablo captures in the quotation from §3 and find the essentialist conception, at least when restricted to those entities, much more plausible than its denial. In view of this, I suggest that what has been developed in the preceding sections be received as an exploration of the type of epistemology of modality for *abstracta* that such a conception makes plausible. Such exploration is pertinent *regardless* of whether we take the essentialist conception to apply to all abstract objects or only some, and *because* we take them to apply to at least some. To the extent that this is so, there is no (or little) *dialectical* risk in the lack of neutrality that assuming such a (possibly restricted) essentialist conception amounts to.

Second, but building on the first remark: whether the *essentialist conception* applies to all abstract objects or to only some, the case for the non-uniformity thesis (from §1) is, in the worst case, left intact. If it applies across the abstract realm, the case is left intact. If it applies to only some, the case for non-uniformity is strengthened for, in that case, a comprehensive modal epistemology might need an extra fold.[29] It is also worth stressing that, on the current diagnosis of the impact of the present concern, the deficit of the epistemology of modality that (Roca-Royes 2017) plus the current paper are jointly sketching would—somewhat less worrisomely—be one of incompleteness, rather than (as per *this* concern at least) one of inadequacy. We would still need to work towards an epistemology of modality for those abstract objects for which the essentialist conception was not a good conception. I shall not embark on this task here. Yet: a driving question should be whether, absent the *essentialist conception* for a subset—whether proper or not, for that matter—of abstract entities, we would still be left with an explanatory task. The suspicion is one of unknowability, in which case the (presumed) phenomenon to be explained—our knowledge—might vanish.

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theories are not *per se* at odds with the *essentialist conception* so I shall not include them above among the noise-generators.

[29] We were already not in a *two*-fold scenario because a sufficiently comprehensive epistemology of modality for *concreta* needs already more than one fold: one for ordinary possibility claims, and one for the remote (knowable) claims whose knowability resists being explained in the way ordinary possibility knowledge are explained. What the main text is pointing out is that, in addition, if the *essentialist conception* is not tenable for all abstract objects, the epistemology of modality for abstract entities might be equally bi-folded.

5.4. Not a principled contrast?

Another potential concern stems from realizing that the contrast (endorsed in §3) between our *ways of thinking* about abstract and concrete entities is not a principled one. There's no impediment to us having conceptions of concrete entities that include (be that in the very singular concept or as part of an associated conception) the idea that a given property, by means of which we manage to think of the object, is essential to the object. The concept *Cowy* from the second case of §2 illustrates precisely that possibility, and this is just one instance of the following recipe for finding analogous possible, essentially-loaded singular concepts: *the one that essentially φ's* (with a concreteness-entailing φ).

Following this recipe I could introduce a singular concept, for instance *EssenDani*, to refer to the first human-looking male organism born in 2014 *such that* his biological origins are essential to him. Assume that biological origins are (indeed) essential to organisms. Under that assumption, and since there were humans born in 2014, *EssenDani* is semantically felicitous (let us assume also that there are not equal-firsts in the race for being born in 2014). *EssenDani*, given these assumptions, refers to the first male human born in 2014. Consider now the following conditional:

(7) If EssenDani exists, his origins are essential

Despite (7) being about a concrete entity, it is—unlike (3) and (4), which also were about a concrete entity—uncontroversial. What is controversial is—as in the case of (5) and (6), which were about an abstract entity—its antecedent.

The worry that emerges from these remarks is that I have not motivated an epistemology of modality for abstract entities *with which to strengthen my case for the non-uniformity thesis*. For—the worry would go—if what has been developed in §4 (and the above clarificatory subsections) is on the right track for the *abstracta*, it is, as per the current subsection, equally applicable to the *concreta* if-and-when singled out in thought through essential-pointing. What I want to do with this worry is to dissipate it, and I shall do so by means of two remarks, each of which might in itself suffice to do so.

First, and very briefly: let us grant for present purposes that there is no principled reason why we do not (usually) think via essential-pointing about concrete entities. But the force of the above sections to further motivate the non-uniformity thesis does not depend on there being one; so the concern does not turn into an objection. For current purposes, it suffices that there be (and there *is*) a *de facto* contrast; namely, that the ways we usually single out concrete entities in thought involve (directly or indirectly) material-demonstrative thinking whereas, in the case of *abstracta*, the singling out is done by means of essential-pointing thinking. My reliance on such *de facto* contrast thus comes without significant dialectical costs.

The second (and lengthier) comment is to the effect that, even once the reasons for the concern have been granted, there still remains a significant (and principled) contrast; namely: that we cannot materially demonstrate abstract entities, but we can materially demonstrate concrete ones.[30] Let me unfold why this contrast is significant,

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[30] I do not mean to suggest that we can materially demonstrate *any* concrete entity. But we can demonstrate any concrete entities about which we can have *material demonstrative de re* knowledge, and this is sufficient for current purposes. Thanks to Jessica Leech for asking me to clarify this.

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even after having granted that we can think about concrete entities through essential-pointing. Paraphrasing what I said in §4, the request for an explanation of *how do we know* that EssenDani has his biological origins essentially presupposes the existence of that piece of knowledge. When that knowledge requires the existence of EssenDani and when, in addition, conditional (7) is uncontroversial, something like (what is expressed by) '*by EssenDani existing*' will be the most interesting (and demanding) part of a satisfactory answer to that question. That paraphrase calls for no qualification; the cases are, admittedly, exactly parallel so far. In §4, I said nothing as to how one could implement the ontological stories that are (as per that section) needed to complete the epistemological answers to questions such as *how do we know that [the number two/EssenDani/Sherlock Holmes] essentially [φ's]*. I hereby submit that the principled contrast calls for different ontological stories in the case of abstract entities and in the case of concrete entities.

Let me begin by unfolding the reasons why the antecedent of (7) is controversial (in the familiar sense of it being more epistemically demanding than the whole conditional) despite being about a materially demonstrable entity. What is not controversial in the vicinity of the antecedent of (7) is our (possible) knowledge that the first human-looking male organism born in 2014 exists. The epistemic demands for this piece of knowledge need not go (significantly) beyond those involved in our (material-demonstrative) knowledge that Cowy exists. Indeed, we might even materially demonstrate that individual; and name him with, for instance, 'Dani'. That existential knowledge, however, would be insufficient to establish *that EssenDani exists*. To establish *this* existence in a way that exploits our knowledge *that Dani exists* we should be in a position to know that *Dani has his origins essentially*; and that is controversial. The following conditional captures exactly this controversy:

    (8) If Dani exists, EssenDani exists   [analogously: If Dani exists, he is EssenDani]

Indeed, in the case of uncontroversial conditionals about concrete entities like (7), the controversy of conditionals like (8) *is* the controversy to which the controversy of their antecedents reduces. Two remarks are pertinent. First, this is the controversy as to whether biological entities have their origins essentially. So we have managed to reduce the controversy of whether *EssenDani exists* (i.e., of the antecedent of (7)) to the old controversy (Roca-Royes 2017) was already about. More needs to be said, therefore, to turn the absence of a principled contrast (between *usual* ways of thinking) into a worry that *two* different types of epistemologies are available in the case of concrete entities (thereby threatening the uniformity thesis). After scrutiny, the two epistemologies turn out to be just one: the old one, on which the non-uniformity case is partly grounded.

And, second, equally salient for current purposes is the fact that conditionals like (8) invite a route to answering the question whether EssenDani exists that depends on antecedent, material-demonstrative thinking about him, and that that route is, by principle, not available in the case of abstract entities. Borrowing—and adapting to the current case—ideas from Hale and Wright (2009):

> There are various courses of action you might undertake to try to settle the matter, at least to your own satisfaction. But ultimately, what you need to do is gather evidence which is arguably sufficient for the truth of an identity statement, ['q = EssenDani'], for some 'q' whose reference to a real man is not in question. In

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> this, 'q' might be a compendious definite description of the words and actions ('the man who said and did all of these things: ...') of an unquestioned real man; or it might be a token demonstrative for [him]. The point generally is that verification of the existence of a referent for [a singular concept] is verification of a [thought] of the form: *(∃x)(x = N)*. And the premium method for doing that is to verify an identity, q = N, where the existence of a referent for 'q' is not in doubt. (Hale and Wright 2009: 202).

They go on to suggest that that route is not available for (their) *abstracta*. In the case of (abstract) objects singular concepts for which have been forged by *abstraction*, the so-forged means of reference are *fundamental*, in the technical sense of there being "no presumption that we have any prior or independent means of reference" (Hale and Wright 2009: 195).

> In these circumstances, verifying that N refers cannot be a matter of verifying that it co-refers with any expression, even a demonstrative, whose reference is not in doubt. (Hale and Wright 2009: 202)

The ontological case for the existence of Hale and Wright's *abstracta* will thus need to be very different in nature.[31] It is an urgent question whether the plausibility of Hale and Wright's remarks here are (abstraction-)theory dependent or not. I shall also leave the exploration of this question for a future occasion. However: the hypothesis that their plausibility survives generalization beyond abstractionism would help to explain that, regardless of from within which theory we think of abstract entities, we don't find, for them, controversial conditionals that would be the counterparts of (8); 'counterparts' relative to the *epistemic role* they play. Conditional (9), despite being analogous to (8), fails to be one such counterpart:

(9) If the immediate successor of the number one exists, then, the entity that is essentially the immediate successor of the number one exists.

A moment of reflection reveals that the controversies between (8) and (9) are inverted: the *essentialist conception* for abstract entities makes (9) uncontroversial and its antecedent controversial. Unlike what holds for the *concreta*, it implies that doubts as to whether the immediate successor of the number one exists cannot be had independently of doubts as to whether the entity that is essentially the immediate successor of the number one exists. This, I submit, is a principled contrast; one that, as anticipated, boils down to the impossibility of materially demonstrating abstract entities and that explains why the cases for the existence of EssenDani and that of the number two will need to be very different even in the case where both are thought of in an essential-pointing manner.

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[31] Hale and Wright's story ultimately rests on entitlements: "Our position, however, is that, in any particular case, [the goodness of an abstraction principle] is a matter of entitlement." (Hale and Wright 2009: 192)

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