

Grounding Modality

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ABSTRACT

One important application of *grounding* – familiar especially from Kit Fine’s work – concerns the attempt to ground modality. Fine’s claim is that metaphysical modality is grounded in essence, and that essence is ontologically prior to modality, rather than the other way around. The idea is that modal truths are true in virtue of the natures of things. In this paper I will examine the ‘true in virtue of the nature of...’ predicate.

I am sympathetic to the Finean account of grounding modality, but it has one serious shortcoming: no explanation of metaphysically impossible yet logically or conceptually possible things is available, even though they would seem to undermine the essentialist’s commitment to metaphysically necessary, essentialist truths. I would like to suggest a revision to Fine’s picture which will enable us to rule out such ‘pseudo-possibilities’. I will argue that the grounding relation must be understood in a stricter fashion than Fine suggests and that we in fact need two different ‘in virtue of’ predicates, one for possibility and one for necessity. The upshot is a consistent essentialist picture of ‘genuine’ modality, but this also requires us to give up the duality of possibility and necessity.

1. Introduction

The aim of this paper is to examine and develop the essentialist account of modality familiar from the work of Kit Fine (1994, 1995a, 1995b, 2000, 2002), who argues that rather than explaining essential properties in terms of modality, we should reduce – or *ground* – metaphysical modality to essence.¹ It is worth pointing out that Fine (2002) explicitly excludes natural and normative modality, that is, he considers them to be further kinds of modality that are not grounded in essence. However, this paper concerns *metaphysical* modality in particular. Specifically, Fine considers necessary propositions to be true in virtue of the natures of the objects they concern. According to this line of thought, logically necessary propositions are true in virtue of the natures of all logical concepts, conceptually necessary propositions are true in virtue of the natures of all concepts, and metaphysically necessary propositions are true in virtue of the natures of all things (as opposed to some proper subset of all things). This also enables us to define conceptual and logical necessity in terms of metaphysical necessity (by restriction), as Fine (2002) has demonstrated.

I am sympathetic to the core idea of the Finean understanding of essence and modality: essence is ontologically prior to metaphysical modality and metaphysical modality can be reduced to essence in terms of the ‘is true in virtue of the nature of...’ operator. An aspect of the Finean account that remains somewhat open is the analysis of this operator, even though Fine’s work has been discussed extensively. The critical attention that Fine’s work has attracted tends to focus either on the feasibility of the view more generally (e.g. Hale 1996, 2002, Zalta 2006) or on the details of the essentialist framework (e.g. Gorman 2005, Correia forthcoming), but there appears to be no consensus about how we should understand the ‘is true in virtue of the nature of...’ operator in the case of essence and modality is particular. This may be partly because

¹ For an extensive analysis of the notion of ‘ground’, see Correia and Schnieder forthcoming.

those who are sympathetic to the Finean account are happy to accept his initial assumptions regarding the relationship between essence and modality, whereas its critics are likely to disagree on a more fundamental level, even before the discussion about the details of this relationship is even relevant.

Although the account that I will suggest is sympathetic to the Finean picture, I consider there to be one serious caveat in the Finean account: there is no reliable method which would enable us to distinguish between what could be called *genuine* metaphysical possibilities and metaphysical impossibilities, or, as I will call the latter, *pseudo-possibilities*. In fact, this caveat is also shared by the approach according to which essence should be understood in terms of modality. In the next section I will examine this caveat in detail and demonstrate why it motivates a novel understanding of the relationship between essence and modality. The third section consists of an outline of the alternative account that I wish to propose, central to which is abandoning the duality of possibility and necessity, and defining different types of possibility and necessity individually. I will also present examples of different types of possibility and necessity as well as explain how we can account for them in the proposed framework. Finally, some implications of the account will be briefly examined in the fourth section.

2. Motivation

An initial motivation for the account that I will propose is that it provides a solution to the problem of pseudo-possibilities, that is, metaphysically impossible yet conceptually or logically possible worlds, such as worlds in which gold is not an element, cats are not animals, water is XYZ instead of H₂O, and so on. I wish to deny the existence of such worlds, or, at any rate, to deny that these worlds are possible in any ‘real’ or ‘genuine’ sense. This is because metaphysically impossible worlds like the ones just mentioned

would conflict with the essentialist truths that ground the corresponding necessities.² This is also one of the key reasons for Bob Hale's (1996: 98) claim that the (essentialist) friends of metaphysical modality cannot accept that logical necessity is absolute; this would imply that there are, for example, logically possible worlds in which gold is not an element. Hale's discussion concerning the relative strength of different kinds of modality is relevant here:

One kind of necessity, \Box_1 , may be said to be *stronger* than another, \Box_2 , if ' $\Box_1 p$ ' always entails ' $\Box_2 p$ ' but not conversely. Assuming the usual relations between necessity and possibility, this relationship will obtain if and only if \Diamond_1 is *weaker* than \Diamond_2 , i.e. ' $\Diamond_2 p$ ' always entails ' $\Diamond_1 p$ ' but not conversely. I shall also say that \Box_1 is *at least as strong as* \Box_2 if the first half of this condition is met, i.e. ' $\Box_1 p$ ' always entails ' $\Box_2 p$ '. (Hale 1996: 94.)

The upshot of Hale's discussion is that logical necessity is *absolute*: it is at least as strong as every other kind of necessity, including metaphysical necessity. More specifically, ' $\Box_{\text{logical}} p$ ' always entails ' $\Box_{\text{metaphysical}} p$ '. According to Hale, this causes problems for the 'friends of metaphysical modality', or the Finean account of metaphysical modality in particular, as it appears that metaphysical modality is, in one sense, only *relative*, whereas the friends of metaphysical modality took it to be absolute, or so Hale claims. However, this does not appear to be correct: the Finean can and does accept that logical necessity is at least as strong as any other type of necessity. The same point has been forcefully made by Scott Shalkowski (1997, 2004) and Fabrice Correia (forthcoming).³

2 Assuming that the classic examples of metaphysical necessities are correct, which is in fact something that I have my doubts about (cf. Tahko 2009b).

3 For another reply to Hale, see Cameron (2010).

I would like to revive the idea that metaphysical modality is absolute in the sense that Hale suggests. This may seem like a peculiar move: after all, Hale specifically argues that the absoluteness of metaphysical modality is something of a problem for the (Finean) essentialist. But since I will also abandon one of the initial assumptions of the Finean picture, namely the duality of necessity and possibility, Hale's argument does not directly apply to this account (and hence I will not discuss it in detail). In fact, my proposal has some important similarities with Hale's (2002) later, more or less essentialist account, although he would surely wish to retain duality.

Now, the challenge that any essentialist account of modality will face is how to deal with logically or conceptually possible but metaphysically impossible things. Correia for instance seems to be happy to accept metaphysical impossibilities – he sees no reason why we should worry about Hale's (1996) argument to the effect that metaphysical necessity is not absolute. But the nature of these metaphysical impossibilities seems peculiar: if we wish to ground modality in essence, and the essence of, say, gold, rules out the possibility of gold having an atomic number different from 79, then how should we understand the apparent logical possibility of gold having a different atomic number? It is true that the laws of logic or the definitions of concepts do not rule out such a possibility, but, at any rate, the modality involved does not seem quite as substantial as metaphysical modality. In the Finean picture, such (logical or conceptual) possibilities can of course be grounded in essence as well, namely the essences of all concepts (or all logical concepts in the case of logical possibility), but this is only via a *negative* definition: the essences of all concepts do not rule out the possibility of gold having an atomic number different from 79. Accordingly, quite like there is a growing literature (e.g. Gendler and Hawthorne 2002) surrounding the issue of whether conceivability is a reliable guide to metaphysical possibility, essentialists

should have a similar interest in the link, or lack thereof, between conceptual or logical possibility and metaphysical possibility. The question is: how can we overcome the epistemic challenge posed by the existence of metaphysical impossibilities that conflict with essentialist truths? Hale's original concern was that if the essentialist accepts that metaphysical necessity is not absolute, then she must also accept the existence of logically possible but metaphysically impossible worlds. But this misconstrues the position of (at least some) essentialists. As Shalkowski notes:

Not only is the essentialist not forced to acknowledge the existence of any such [logically possible but metaphysically impossible] worlds, essentialism, in its current forms, just is the denial of their existence. To say that some things are logically possible but metaphysically impossible is not to deny that logical necessity is absolute in the technical sense given [by Hale]. It is to say, rather, that any logical possibilities that fail to be metaphysically possible are not real possibilities. (Shalkowski 1997: 48.)

The point that Shalkowski wants to make is that logical possibilities that are metaphysically impossible are not genuine possibilities at all, they are possibilities 'in name only' – only metaphysical possibilities are genuine or real possibilities. It also follows that logical possibility is not a reliable guide to genuine or metaphysical possibility, since there is no apparent method for picking out the genuine possibilities from the vast range of logical possibilities. So, Shalkowski claims that logically possible worlds are not worlds at all, since they do not reliably correspond with the ways the world might be – after all, we supposedly know that gold *could not* have any atomic number other than 79. There is thus no sense in which a logically possible *world* exists where gold has a different atomic number; we can perhaps describe such a world,

but it *could not have been* realised.

One might think that this discussion has an *ad hoc* flavour, but it is worth noting that Hale himself makes a very similar move with regard to what he calls *austerely* logical possibilities, such as the proposition <there are male vixens>. Hale (1996: 100) simply states that these are not genuine possibilities. In any case, the problem that such non-genuine, pseudo-possibilities pose for modal epistemology is a problem at least for any non-deflationary account of modality, and perhaps for the Finean essentialist picture in particular. We should somehow be able to distinguish genuine metaphysical possibilities from metaphysically impossible pseudo-possibilities that are nevertheless conceivable or logically possible. I will suggest that this can be achieved with the revised essentialist account of modality developed in this paper.

Excluding metaphysical impossibilities – or considering them to be pseudo-possibilities – causes a further problem: it appears to make distinguishing between metaphysical, conceptual, and logical possibility redundant, as they become co-extensive. If we reduce modality to essence and take conceptual and logical necessity to be special cases of metaphysical necessity, and also exclude conceptual and logical possibilities that are not genuine, i.e., not also metaphysically possible, then we are really left with only one modal space: the space of genuine, metaphysical necessity.

Hale has noticed this as well:

[T]here is a temptation to say that just because the necessity of non-basic necessities is explained, ultimately, by reference to necessities in the base class, with those necessities themselves being explained in terms of facts about essences, all necessities have their source in such facts. This suggests an alternative view, on which there is, from an *ontological* or *metaphysical* point of view, no distinction to be drawn between more or less fundamental necessities—the class of necessities

as a whole is flat and unstructured [...]. (Hale 2002: 316.)

Hale goes on to suggest that on this model, different types of modality can be distinguished only in terms of their epistemological significance. This is not Hale's preferred line, and understandably so. Instead, he opts for a model which retains some structure in the class of necessities, even though all necessities have to be ultimately explained with reference to the essentialist base class.

According to the line that I wish to develop, the apparent flatness of the essentialist modal space can be endorsed, but despite this, there is no reason why we could not use the notions of conceptual and logical modality in the same manner that we commonly use, for instance, the notions of physical or biological modality – they are not modalities in their own right, rather, they are different subspecies of metaphysical modality. One way to justify the usage of such notions is, as Hale suggests, epistemological: the essentialist facts in virtue of which the non-metaphysical (I hesitate to call them non-basic) modalities are true concern the relevant proper subsets of all things: physical, biological, conceptual, logical etc. Further to these distinctions, there is also a group of modalities which is more general than the modalities which can be delimited by restriction from all things; these include all metaphysical modalities which are not possible or necessary, say, in virtue of the natures of concepts or the laws of physics, but in virtue of the natures of the things that are not included in any of these specific proper subsets of all things. It is rather difficult to determine what this group of modalities includes, but we will consider some examples in what follows.

If metaphysical modality is regarded as the only fundamental type of modality, then the applicability of notions such as 'conceptual necessity' and 'logical necessity'

becomes largely a terminological issue: they can either be defined (by restriction) in terms of metaphysical necessity as described in Fine (2002), or they can be interpreted as co-extensive with metaphysical necessity, provided that metaphysically impossible conceptual or logical possibilities are excluded (since they are merely pseudo-possibilities). However, since the latter option makes logical and conceptual modalities redundant, it is desirable to attempt to define them in such a way that they would still be useful. Accordingly, we should read these modalities as strictly as possible. To this end, we can employ the idea that only the essences which are involved in *making* a given proposition possible or necessary are relevant, as I will now proceed to suggest.

3. Defining the alternative account

According to the picture that will be presented in this section, different subspecies of metaphysical modality, such as conceptual and logical modality, should be considered as concerning the natures of specific proper subsets of the set of all things. Instead of the Finean ‘is true in virtue of the nature of...’ operator, we will need two distinct operators – one for possibility and one for necessity – that latch on to what makes a certain proposition possible or necessary, rather than what makes it true. We can then define different types of necessity and possibility as follows:

MET: p is metaphysically necessary (possible) iff p is necessary (possible) in virtue of the nature(s) of the (concrete, non-conceptual) entities relevant to p .

CON: p is conceptually necessary (possible) iff p is necessary (possible) in virtue of the nature(s) of the (abstract) concepts relevant to p .

LOG: p is logically necessary (possible) iff p is necessary (possible) in virtue of the nature(s) of the (abstract, non-conceptual) logical entities relevant to p .

These definitions require explication. Firstly, ‘entities’ should be interpreted liberally here, merely as a placeholder: ‘logical entities’ for instance are perhaps best understood as laws of logic, and in the case of metaphysical modality things like general metaphysical principles might qualify – this will be illustrated with examples. Defining necessity and possibility in terms of what is ‘relevant’ for the proposition in question also requires further explanation. The idea is that p is metaphysically necessary only in virtue of the particular nature or natures of the entities that are *actively* involved in making p necessary. What I mean by *active* involvement is that particular features of the essence of a given object give rise to the modal constraints that it manifests – this serves to distinguish genuine modalities from the supposed modal truths that emerge only *passively*, namely via the *lack* of modal constraints. Modal truths that emerge passively are, due to the manner of their introduction, (pseudo-)possibilities: for instance, if a given scenario is not contradictory, i.e. it is not ruled out by conceptual or logical analysis, then it is generally judged to be possible. This method of generating possibilities in terms of the absence of contradictions is passive because it does not take into account the actively introduced constraints that emerge directly from the essences of objects; this is why certain things can be judged conceptually or logically possible (passively) even though they appear to contradict certain actively introduced metaphysical necessities.

To fix this unfortunate conflation of active and passive elements in generating modal truths, under the current proposal we should understand ‘relevance’ of a given essence

or essences to the necessity or possibility of p strictly in terms of the role of that essence or those essences in making p possible or necessary. The details of how this works are examined in the following subsections. What remains to be determined is what exactly *is* relevant in making a given proposition possible or necessary, that is, which essences are involved in making a given proposition metaphysically, conceptually or logically possible or necessary.

Perhaps the most striking feature of the proposed approach is that possibility and necessity will not be interdefinable in the usual sense, i.e., it is not the case that p is possible iff not- p is not necessary, and it is not the case that p is necessary iff not- p is not possible. So, all different types of possibility are proper subsets of metaphysical possibility, and metaphysical impossibilities are merely pseudo-possibilities, while at the same time all different types of necessity are proper subsets of metaphysical necessity. On the face of it, this picture may seem blatantly confused, as the duality of possibility and necessity is a very intuitive idea. In what follows I will attempt to demonstrate that a non-dual account of possibility and necessity is nevertheless consistent and that there are reasons to think that an essentialist account of modality ought to take this direction and abandon the duality of possibility and necessity.

3.1 Conceptual modality

We can now proceed to analyse examples of different types of modality. The purpose of this discussion is to explicate the notion of relevance associated with the possibilities and necessities expressed by propositions. According to the proposed picture, different subspecies of metaphysical modality should be considered as concerning the natures of specific subsets of the set of all things, exclusive of one another. For instance, conceptual modality concerns things that are possible or necessary strictly in virtue of

the natures of concepts, and only them.

On my preferred understanding of relevance, conceptual modalities turn out to be fairly uninteresting. For example, although it would commonly be considered that something like the proposition <it is possible to travel faster than light> is conceptually possible, according to this picture this is not correct: the possibility of travelling faster than light is not ruled out by the natures of concepts, but nor do the natures of concepts *make* it possible to travel faster than light – the essence of the concept of superluminal travel is not *relevant* for the possibility expressed by the proposition. This may admittedly seem counter-intuitive, since one common way to understand conceptual possibility is that anything the definitions of concepts do not rule out is conceptually possible, and surely there is nothing inconsistent in the concept of superluminal travel. Perhaps so, but the requirement of relevance, as I am using the notion, calls for a *positive* analysis of modality rather than the negative one suggested by the idea that anything not *ruled out* by the definitions of concepts is conceptually possible.

One way to illuminate the notion of relevance is to consider the ‘in virtue of’ relation as analogous to the truthmaking relation, that is, what makes something conceptually possible are the natures of certain concepts. Now, if we consider our example <it is possible to travel faster than light>, it would seem that we cannot give a positive analysis of it in terms of the natures of concepts. This is because the natures of concepts are not viable *possibility-makers* for the possibility of superluminal travel, which is surely a physical process. Presumably, it is not even *physically* possible to travel faster than light (if physical possibility is understood in terms of the actual, true laws of physics), so it appears that if it is possible at all, it must be *metaphysically* possible; to use the possible worlds jargon, there exists a metaphysically possible world in which the laws of physics differ from the ones in the actual world and allow for faster than light

travel, perhaps even a spacecraft that is capable of superluminal travel.

The obvious problem for this approach is that we need to be able to determine what the viable possibility- and *necessity-makers* are in the case of different types of possibility and necessity. Regarding this problem, I propose to take advantage of an idea that has already been discussed in the essentialist literature. I have in mind Correia's (forthcoming: 14) distinction between properly conceptual and not properly conceptual truths, the former being truths that concern the 'conceptual part' of the basic nature of the concept, whereas the latter are truths that are at least partly dependent on some 'non-conceptual' content. Correia gives the proposition <no bachelor is married> as an example of the former and the proposition <bachelorhood is a concept> as an example of the latter. In the first case we appear to be dealing with the meaning or definition of the concept, as we are effectively giving the definition of the concept 'bachelor'. However, the latter proposition states something extra-conceptual about the concept 'bachelor', namely that it is a concept. This has nothing to do with the definition or meaning of 'bachelor', it simply states something that is quite generally true of *any* meaningful string of letters that one might find in a dictionary, i.e., they are concepts. In fact, there may be a useful analogy for this distinction in the *de re* vs. *de dicto*, or perhaps even in Aristotle's distinction of what is 'in' a subject and what is 'being said of' a subject. The core of the distinction, in any case, is that it is quite different to talk about the individual nature of an object on one hand and relational or categorical classifications that may apply to the object on the other hand. It is this type of distinction that we need to invoke to be able to account for relevant possibility- and necessity-makers. Although Correia does not use this distinction for the same purpose as I do, only a small modification is needed to apply it to the case at hand, namely, in the proposed account being e.g. 'properly conceptual' is associated with the relevance of a

given essential feature to the possibility or necessity of a given proposition, that is, only properly conceptual essential features can act as possibility- or necessity-makers for conceptual modalities. We should also keep in mind that duality with respect to possibility and necessity is not a part of the proposed picture: the lack of possibility-makers for a given proposition p does not entail that $\text{not-}p$ is necessary (although this could still turn out to be the case if we find an appropriate necessity-maker for $\text{not-}p$).

So, what is the necessity-maker for, say, the proposition <no bachelor is married>? Here we can follow Fine (1994), who suggests that it is essential for a given word that it means what it does – a definition states an essential property of a word. On this view, the necessity-maker would appear to be closely connected with the meaning or definition of the concept. Hence, it is fairly easy to account for the conceptual necessity of all usual examples of necessary (analytic) truths like <no bachelor is married> in this picture. However, conceptual possibilities are more of a problem. Given the strict understanding of relevance with respect to essence, in the case of conceptual possibility we ought to be able to find some proposition which is possible in virtue of the nature(s) of the concept(s) involved in the proposition. But are there any such propositions? One might think that the proposition <no bachelor is married> would express a conceptual possibility as well, but since duality with respect to possibility and necessity does not hold in this picture, this does not follow automatically – in other words, necessity-makers are not possibility-makers. Because of this, it appears that the natures of concepts are not likely candidates for possibility-makers at all. If we take the meanings or definitions of concepts (and only them) to be integral parts of the essences of concepts, then they can only act as necessity-makers: the essences of concepts give rise to necessary (analytic) truths, not to possibilities.

But what about simple true propositions such as <I had a bagel for breakfast today>?

Surely, being true, this proposition is also conceptually (as well as logically and metaphysically) possible? Not according to the proposed picture. The proposition is certainly possible, but we must once again ask what the *relevant* possibility-maker is in this case. Quite uncontroversially, the possibility-maker in this case is the physical event that took place earlier today, namely eating a bagel. Accordingly, the proposition in question is surely (at least) physically possible. In contrast, for an unactualized possibility, such as having a banana for breakfast today, the possibility-maker is more complex. It still refers to a physical event, but judging whether the physical event in question is possible (or *was* possible, given that I did not have a banana for breakfast) depends on a number of empirical factors, e.g. on whether there were any bananas available in the vicinity of my apartment this morning. Indeed, had there been a severe shortage of bananas this morning, the possibility would have lacked relevant possibility-makers, but since I actually saw some bananas on sale on my way to work this morning, I can confidently say that any of those bananas is a relevant (physical) possibility-maker for the proposition <I could have had a banana for breakfast today>.

What we can conclude from this discussion is that the set of conceptually possible propositions, when understood in the terms that I have suggested, is likely to turn out to be empty. If this is the case, then all conceptual modalities are conceptual necessities, making conceptual modality a much smaller class of modalities than is usually thought.

3.2 Logical modality

Let us now turn to logical modality. According to the proposed picture, logical modality concerns things that are possible or necessary in virtue of the natures of logical concepts relevant to the proposition under investigation. Consider the proposition: <If it rains, it pours. It rains. Therefore, it pours>. This proposition is logically necessary, and, as I see

it, the modal content of the statement has logical validity as its source, i.e., the conclusion follows by logical necessity if the premises are true and the content of the statement is irrelevant. The relevant necessity-maker in this case is the logical form of the proposition: <If A, then B. A. Therefore, B>. In general, it will be relatively easy to find necessity-makers for logically necessary propositions, provided that we are in agreement about what the correct laws of logic are.

What about logical possibility? This would again seem to be a more problematic case: if logical modality has logical validity as its source, and logical validity always entails necessity, then all logical modalities would turn out to be logical necessities, exactly like in the case of conceptual modality. This is indeed the case if we consider logical modality to concern only one logic, perhaps combined with the idea that there is only One True Logic, either in the sense that only one logic accurately reflects the structure of the world, or in the sense that rational arguments can only be formalized in one logic. But the situation is different if we take alternative logics seriously and consider them to be metaphysically possible.

The possibility of alternative logics can be understood in several ways (cf. Beall and Restall 2006), but logical pluralism of any kind does require further motivation. In any case, since I take the possibility of such pluralism seriously, I believe that before we can determine exactly which things fall within the scope of logical modality, we must inquire into the metaphysical status of logic, and specifically alternative logics. It is not particularly difficult to account for the idea of alternative logics in the proposed model, as we can consider each alternative logic as a further proper subset of metaphysical necessity. However, there would be some overlap between these logics: even though certain (classical) laws of logic do not hold in all alternative logics, many of them remain the same. This implies that certain statements would fall into more than one

category, for instance, the proposition <If it rains in England and it rains in Scotland, then it rains in England or it rains in Scotland> has a relevant necessity-maker in classical logic, but also, for instance, in intuitionistic logic. This is because all formulas provable in intuitionistic logic are also provable in classical logic, even though the law of the excluded middle does not hold in intuitionistic logic.

What does this have to do with the scope of logical possibility? The interesting question concerns those laws of logic which *do* vary between alternative logics, such as the law of non-contradiction. For instance, if we include paraconsistent logic in the picture, then true contradictions are logically possible. One way to understand logical modalities in this picture would be to consider logical possibility as an umbrella term which encompasses all kinds of alternative logics, although it may be more helpful to distinguish between classical logical possibility, paraconsistent logical possibility, and so on. Conversely, logical necessity could be understood to apply only to those laws of logic which do not vary between alternative logics at all. Of course, nothing stops us from introducing further subspecies of logical necessity for each alternative logic as well, should we wish to do so, in which case we could associate each subspecies of logical necessity with logical validity within that specific logic. These questions do not need to be settled here though, it is sufficient to note that whichever approach we take, it can be accommodated in the proposed model.

There is an alternative route for interpreting logical modality, which might in fact be more viable. This route comes from Scott Shalkowski (2004: 77–81), who outlines two possible ways to interpret logical modality in an essentialist account of modality:

Essentialists have at least two ways of explaining logical necessity. One is to explain logical necessities as those true in virtue of the natures of logical items, perhaps propositions and their

constituent concepts or else other truth bearers and their constituents. Alternatively, logical necessities might be explained as those propositions true in virtue of the natures of every situation or every object and property, thus preserving the idea that logic is the most general science. (Shalkowski 2004: 79.)

The first route is similar to the one I sketched above, but the second route offers a way of reading logical modality that makes it continuous with metaphysical modality. According to this approach, logical modality concerns the most general metaphysical truths, such as, perhaps, the law of non-contradiction when it is considered as a metaphysical principle.⁴ The set of non-logical metaphysical modalities would then consist of less general metaphysical truths, such as classic examples like the proposition <gold is the element with the atomic number 79>. As Shalkowski (*ibid.*, 79–80) puts it, logical facts could be understood as general facts about essence – logical relations would reflect the relations of individuals, properties, and states of affairs rather than mere logical concepts. The idea is that the purpose of logic is to describe the structure of reality and so it is ‘the most general science’.

The advantage of this approach is that we can establish clear criteria of how to distinguish between genuine, metaphysically possible logical possibilities and metaphysically impossible pseudo-possibilities which nevertheless seem logically possible. The criteria is based on the general nature of the logical necessities: logical principles such as the law of non-contradiction understood as general facts about essence do not rule out metaphysically impossible propositions such as <gold is the element with the atomic number 78>; but once we consider the full essence of gold we can rule out this (pseudo-)possibility. Shalkowski concludes that ‘If the logically possible is simply that which contravenes no universal essentialist facts, then it is not at

4 I have discussed the status of the law of non-contradiction as a metaphysical principle in my (2009a).

all surprising that not all logical possibilities are genuine possibilities' *ibid.*, 80). So, if we only consider those essentialist facts that are shared by all things, the set of propositions that is possible in virtue of those facts will be much broader than the scope of metaphysical possibility, which is constrained by the full spectrum of essentialist facts.

This alternative approach to logical modality is thus appealing to those who wish to preserve the idea that logical necessity concerns the most general truths, and it may help to highlight the role of general (metaphysical) principles such as the law of non-contradiction. Shalkowski (*ibid.*, 81) suggests that denying the truth of the law of non-contradiction within this type of framework would amount to a genuine metaphysical attitude instead of, say, the rather trivial point that a consistent model in which the law does not hold can be constructed. Ultimately the difference between these two interpretations of logical modality is not so striking though: (some of) one's metaphysical commitments would simply be reflected in one's logic.

I am sympathetic to Shalkowski's speculative approach to logical modality, and it also fits well into the broader picture that I am proposing. Logical necessity turns out to be a special case of metaphysical necessity, where the relevant necessity-makers are general logical, or, more precisely, metaphysical principles. For instance, the necessity-maker for the proposition <Nothing can be both red and blue all over at the same time> is the law of non-contradiction, assuming that the law of non-contradiction indeed is a metaphysically necessary, general essentialist fact. It is an open question what the general essentialist facts that act as necessity-makers for logical necessities are, but we can at least be fairly confident that there is only one set of them. Thus, on this interpretation we do not have to accommodate alternative logics (but we better have an idea about what the correct logic is). This also means that, like in the first picture that I

sketched about logical modality, the set of logically possible propositions will turn out to be empty. The reason for this is that the general essentialist facts that logical modalities are grounded in are only capable of acting as necessity-makers, not as possibility-makers. As Shalkowski observes, these facts do not rule out pseudo-possibilities, but recall that a negative definition of possibility based on this type of non-exclusion not available in the proposed picture. Accordingly, omitting logical possibilities entirely is not a consequence of Shalkowski's approach to logical modality, but rather a consequence of integrating this understanding of logical modality into the proposed account of essence and modality which abandons duality.

Shalkowski entertains a further idea – inspired by the previous analysis of logical modality – that is compatible with this account:

Physical necessities, for instance, might be seen as those necessities that pertain to all and only physical objects, thus making a complete science of the physical a complete specification of the essence of a physical object. Mathematical necessities are those that are true in virtue of the essences of mathematical objects. And so on. (Shalkowski 2004: 80.)

Analysing physical and mathematical necessities in this manner fits nicely into my preferred approach, although they would of course have to be accounted for in terms of the notion of necessity-making that I have been using. It is easy to see how this would work with mathematical propositions: the necessity-makers in virtue of which they are necessary are the essences of the relevant mathematical objects. The case of mathematical possibility, however, would plausibly turn out to be similar to conceptual and logical possibility – such is the nature of the general essentialist facts concerning mathematics, they are only suitable for grounding mathematical necessities. Physical possibilities, however, can be accommodated, as we have already seen. The same goes

for chemical, biological, and any other type of possibility that can be defined by restriction from metaphysical possibility.

3.3 Metaphysical modality

Finally, let us consider a few examples of metaphysical modality. I consider it an advantage of the proposed picture that the set of metaphysically possible propositions is by far the most populated. Since it turned out that there are no relevant possibility-makers for conceptual, logical and mathematical possibility, this is not a surprising result. I already suggested that propositions such as <it is possible to travel faster than light> are metaphysically possible, since the possibility-maker must be a (presumably physically impossible) non-actual possible world with alternative laws of physics, or more precisely, the nature of space-time in that particular possible world. I should note though that the exact relationship between metaphysical and physical modality depends on one's preferred understanding of physical modality. If physical modality is considered to emerge strictly in terms of the actual, true laws of physics, then any possible world with alternative laws of physics will of course be physically impossible (but it *may* be metaphysically possible). However, if the actual laws of physics are considered to be metaphysically necessary, as some philosophers argue (e.g. Ellis 2001, Bird 2007), then physical and metaphysical modality are aligned in many cases, and indeed there would in fact not be a relevant possibility-maker for the proposition <it is possible to travel faster than light> – assuming that superluminal travel is physically impossible of course. I wish to leave it open here what exact the relationship between physical and metaphysical modality is, but I am inclined to think that some laws of physics probably are metaphysically necessary, even though many are probably not.

Another interesting example might be the proposition <Tibbles the cat could be

transmuted into a dog>. This proposition can be interpreted in two different ways. There may be a physical possibility-maker for it which latches on to the nature of transmutation, that is, if transmutation is physically possible, say, by some manner of genetic engineering, then Tibbles could be transmuted into a dog. But whether or not this is the case, there is a potential metaphysical possibility-maker for the proposition, namely, the individual essence of Tibbles. If we consider it non-essential for Tibbles to be a cat, then it is metaphysically possible to transmute him into a dog in such a way that Tibbles will maintain his identity. I do not want to take a stand on whether being a cat is in fact essential to Tibbles or not, but the case is appropriate for illuminating the nature of metaphysical possibility in any case. Conversely, the *kind* 'cat' could surely not change into the kind 'dog', it is only the essentiality of membership of *individual* cats in the kind 'cat' that is at issue here.

From this discussion it is natural to move to metaphysical necessities. On the face of it, all the usual examples of (*a posteriori*) metaphysical necessities such as the proposition <cats are animals> or <gold is the element with the atomic number 79> will qualify under the proposed scheme as well. The problem with these examples is that the necessity-makers are often controversial because they involve the essences of things like elements, chemical substances, and biological species. It is at least debatable whether, say, the atomic number is part of the essence of elements, not to mention the problems associated with species (e.g. Dupré 2002). But this is not the place to determine what is or is not essential, presently I am only interested in the type of necessity-makers needed to make a proposition metaphysically necessary.

Normally it would be easy to point out less controversial examples of metaphysical necessity, such as perhaps the law of identity or the law of non-contradiction. However, under the proposed scheme the relevant necessity-makers for these highly general

principles would seem to be of a logical rather than metaphysical nature. Since I adopted Shalkowski's idea that logical necessity concerns the most general essentialist facts, it turns out that the most uncontroversial examples of metaphysical necessities – for it is natural to interpret them as concerning general essentialist facts – fall into the domain of logical necessity. I should note though that this decision is partly terminological; we could have decided to restrict the notion of logical necessity to those cases where the necessity-makers are properly logical rather than metaphysical principles. The decision does hang partly on one's views concerning the metaphysical status of logic though, as Shalkowski's idea is only viable if the logical principles in question can be understood as general essentialist facts that all objects must adhere to, and it is debatable whether the law of non-contradiction, for instance, is such a general essentialist fact. I do consider it to be a highly plausible candidate for a general essentialist fact, but there are those who have argued in favour of true contradictions in the world (cf. Priest 2006; see also Tahko 2009a).

4. Conclusion

To recap, the upshot of the proposed account is that, when reducing modality to essence, the 'true in virtue of the nature of...' operator can be replaced with two separate operators, one for possibility and one for necessity. This produces a stricter notion of modality than the one suggested by Fine and also requires giving up the duality of possibility and necessity. The advantages of this account are a natural way to distinguish genuinely possible and metaphysically impossible yet conceptually or logically possible propositions, i.e., pseudo-possibilities (since there are no relevant possibility-makers for such propositions), as well as justifying the status of metaphysical necessity as 'absolute'. The account also makes better use of the notion of metaphysical possibility,

as it turns out that nearly all of the most interesting applications of possibility – such as the possibility of zombies and other thought experiments relying on similar scenarios – would have to be explained in terms of relevant possibility-makers to constitute genuine possibilities. More generally, being able to conceive of scenarios is not sufficient, nor is the fact that they are not ruled out by *a priori* reasoning. Hence, there will be important implications concerning the epistemology of modality as well, but these are the subject of another paper.

A further advantage of the proposed account is that we can rule out problematic cases of derivative or consequential essence: if Socrates is essentially human, then it follows that Socrates is either human or a mouse, and according to the usual Finean story, the latter is also essential to him. But this would seem to needlessly expand the class of essential truths concerning Socrates. Hence, one advantage of the view at hand over the original Finean picture is that we can focus on the core essential truths and avoid the problems associated with derivative or consequential essence.⁵

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