

On How (Not) to Define Modality in Terms of Essence

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In his influential article ‘Essence and Modality’, Fine proposes a definition of (conceptual, logical and metaphysical) necessity in terms of the primitive essentialist notion ‘true in virtue of the nature of’. Fine’s proposal is suggestive, but it admits of different interpretations, leaving it unsettled what the precise formulation of an Essentialist definition of necessity should be. In this paper, four different versions of the definition are discussed: a singular, a plural reading, and an existential variant of Fine’s original suggestion and an alternative version proposed by Correia which is not based on Fine’s primitive essentialist notion. The first main point of the paper is that the singular reading is untenable. The second that given plausible background assumptions, the remaining three definitions are extensionally equivalent. The third is that, this equivalence notwithstanding, Essentialists should adopt Correia’s version of the definition, since both the existential variant, which has de facto been adopted as the standard version of the definition in the literature, and the plural reading suffer from problems connected to Fine’s primitive essentialist notion.

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1 Essentiality and Metaphysical Necessity

Philosophers who take seriously the distinction between essential and accidental properties usually assume that there is a close connection between essentiality and metaphysical necessity.¹ Indeed, the received view has long been that the former notion is definable in terms of the latter. According to the standard version of the modal definition of essentiality, a property is essential to an object if, and only if, it is metaphysically necessary that the object has the property, if it exists. This version of the definition was, and perhaps still is, widely held.²

A highly influential objection to the sufficiency-direction of the definition has been presented in Fine (1994). Fine presents four counterexamples to the modal definition, examples of properties which the definition classifies as being essential to a certain object, but which intuitively do not have this status: First, the modal definition implies that every object essentially exists, since it is metaphysically necessary for any object that the object exists, if it exists. Second, it implies that for any metaphysically necessary proposition $\langle \Phi \rangle$ and any object, the object is essentially such that Φ , since it is metaphysically necessary for any object that Φ , if the object exists.³ Third, it implies that it is essential to Socrates that he is distinct from the Eiffel Tower, even though ‘there is nothing in his nature⁴ which connects him in any special way to it.’ (Fine (1994), p. 5.)

The fourth and most frequently discussed of Fine’s objections draws on an intuitive contrast regarding the essential properties of Socrates and $\{Socrates\}$, the singleton set which contains Socrates. It is both metaphysically necessary that Socrates is an element of $\{Socrates\}$, if he exists and that $\{Socrates\}$ has Socrates as an element, if it exists. If the modal definition of essential properties is correct, it follows that it is essential to Socrates that he is an element of $\{Socrates\}$ and that it is essential to $\{Socrates\}$ that it has Socrates as an element. This, argues Fine, is wrong. He accepts the second essentialist claim, but rejects the first, because he assumes that, again,

¹In this paper, I will presuppose that both the notions of essentiality and of modality are intelligible and have non-trivial applications. Sceptical worries about both notions will not be discussed, even though I believe that one may reasonably have them.

²Mackie for example accepts the definiens of the definition as an adequate formalisation of the claim that x is essentially- F , given that x is a rigid designator. See Mackie (2006), p. 6. Salmon’s criterion of non-trivial essentialist import presupposes the definition. See Salmon (1979), p. 704. A logically equivalent formulation of the definition can also be found on p. 301 of Wiggins (1976).

³Throughout the text, I will use angular brackets $\langle \dots \rangle$ to form names for the propositions corresponding to the sentences they enclose. Φ is used as a sentence-variable, where the sentence can be either logically simple or complex. I will mostly rely on the context to distinguish between use and mention, but will sometimes use regular quotes ‘...’ when needed to avoid confusion.

⁴Note that Fine uses ‘nature’ and ‘essence’ interchangeably.

there is nothing in Socrates's essence which connects him to his singleton set.⁵ Fine's claim is hence that there is a fundamental asymmetry in essential properties between Socrates and $\{Socrates\}$, which is lost if essentiality is defined in terms of metaphysically necessity.⁶ Fine's counterexamples are widely accepted among philosophers interested in essence. Roca-Royes (2011), p. 66 for example observes about the fourth counterexample that 'virtually everyone' working on the topic accepts Fine's claim that objects are not essentially elements of their singleton set.⁷

Based on his objections to the modal definition of essential properties, Fine suggests that instead of 'viewing essence as a special case of metaphysical necessity, we should view metaphysical necessity as a special case of essence,' (Fine (1994), p. 9.) whereby the notion of essence (or often also nature) is treated as a theoretical primitive instead of as a defined term. This suggestion leads him to propose an essentialist definition of metaphysical modality, according to which the metaphysically necessary truths 'are the propositions which are true in virtue of the nature of *all objects whatever*' (ibid.; my emphasis),⁸ where Fine uses 'object' leniently for both objects and concepts, such as the concept of being a bachelor or the logical concept of disjunction. (See Fine (1994), p. 9.) Fine furthermore claims that this proposed definition can be generalized to conceptual and logical necessity and to 'the necessities of a given discipline, such as mathematics or physics.'⁹

His proposal to define necessity in terms of a primitive notion of essence is remarkable, for it offers us an interesting alternative to standard possible-worlds-based theories of modality, such as e.g. the Modal Realist theory developed and defended in Lewis (1986). However, as I will argue below, interpreting Fine's proposal is not as straight-forward as one might think. His brief remarks leave room for several different Essentialist definitions of metaphysical necessity. In order to solidify the status of their theory as a genuine alternative to more established theories of modality, Essentialists have to first settle

⁵See Fine (1994), p. 5.

⁶Note that a similar objection has earlier been raised in Dunn (1990), p. 89, using Tom and the set $\{Tom, Harry\}$ as the example.

⁷This does however not mean that Fine's argument against the modal definition has gone unchallenged. See e.g. Correia (2007), Cowling (2013), Denby (2014), Gorman (2005), Livingstone-Banks (2017), Wildman (2013), Wildman (2016), and Zalta (2006).

⁸Note that Correia (2006) argues that an Essentialist definition of metaphysical necessity should take a generic notion of essence into account and that Fine (2015) registers agreement. I will not discuss this proposal in any detail in this paper, since it affects none of the main arguments. They could be straightforwardly adapted to versions of the discussed definitions which take generic essentiality into account.

⁹Fine (1994), p. 10. Note that the focus of this paper is mostly on the notion of metaphysical necessity, but the main arguments are equally relevant for generalizations of Fine's definition to other kinds of necessity.

the crucial question of what the correct formulation of their definition of metaphysical necessity is.

This paper proposes an answer to this question by making three main points about the Essentialist theory of modality. After introducing a singular and plural readings of Fine's proposal for an Essentialist definition of necessity (section 2), I will first argue that the singular reading is untenable (section 3) and that the plural reading has to be combined with a further assumption in order to avoid the problem which undermines the singular reading (section 4). Second, I will show that the plural reading and two further variants, one which is based on a less close reading of Fine's proposal and which has established itself as the de facto standard formulation in the literature, and the alternative definition proposed in Correia (2012), are, given plausible background assumptions, extensionally equivalent, where 'extensionally equivalent' means that they classify exactly the same propositions as metaphysically necessary (section 5). The third and final point is that both the plural reading and the de facto standard formulation face serious problems and that Essentialist should therefore adopt Correia's definition (section 6).

2 Two Readings of Fine's Definition of Necessity

Fine (1994)'s proposal that the metaphysically necessary propositions are those propositions which are true in virtue of the nature of all objects admits of two different readings. We may parse the proposal as containing either a universally quantified statement about each object or a plural statement about all objects taken together. Before I discuss the two readings in detail, something first needs to be said about the main ingredient of the proposed definition, the notion 'true in virtue of the nature of'.

Following Correia (2012), 'true in virtue of the nature of' can be treated as a relational predicate which takes a proposition and either an object or a plurality of objects as its two relata.¹⁰ This relational predicate gives us a regimented way of making claims about the essences of objects or pluralities of objects and of spelling out Fine's idea that the essence of an object or of a plurality of objects can be captured by a class of propositions.¹¹ Accordingly, to say that it is true in virtue of the nature of Xanthippe that she is human, is to say that Xanthippe is essentially human and to say that the natural numbers' being numbers is true in virtue of the nature of the (plurality formed

¹⁰See Correia (2012), p. 641.

¹¹Note that Fine's proposal should not be understood to give us an analysis of essences in terms of natures. Fine simply treats 'true in virtue of the nature of', and also 'true in virtue of the identity of', as synonyms for 'true in virtue of the essence' of. See Fine (1995c), p. 69, endnote 2.

by the) natural numbers, is to say that the natural numbers are essentially numbers.¹²

A further clarification concerns the use of the notion ‘plurality’. Why not simply say that ‘true in virtue of the nature of’ takes a set and a propositions as its relata? One reason is that there are pluralities of objects which do not form a set, but which might nonetheless be claimed to have essences. There is, for example, a plurality of all sets, but there is no set containing all sets, at least not in standard set theory. Since essentialists presumably also want to be able to theorize about the essences of such collections, I will assume that ‘true in virtue of the nature of’ takes pluralities instead of sets as its first relatum.¹³

Before I finally get to the two readings of Fine’s definition, let me introduce three conventions which will serve to facilitate discussing essentialist claims. First, I will use the notion ‘*tvn-relation*’ as a shorthand for ‘true in virtue of the nature of’. Accordingly, if it the number two is essentially such that it is even, I may write that the proposition ⟨The number two is even⟩ is *tvn-related* to the number two, or equivalently, that the number two is tvn-related to this proposition.¹⁴ Second, I will adopt a liberal use of ‘plurality’ according to which a single object may be treated as a special case of a plurality. Third, I will sometimes leniently write about pluralities as if they were singular entities like sets. This is also merely a stylistic choice which should not be taken to imply the existence of set-like entities which exist in addition to the singular objects plurally quantified over or referred to.

This brings me to the two readings of Fine’s proposal. To repeat, Fine proposes to identify the metaphysical necessities with ‘the propositions which are true in virtue of the nature of all objects whatever.’ (Fine (1994), p. 9.) On the first reading, this claim

¹²Standard examples of essential properties like the ones just given are notoriously controversial, but I will, for the sake of the argument, simply accept them as uncontroversial throughout the paper.

¹³For more on plural logic, see e.g. Oliver and Smiley (2013). Note that Fine himself does not talk about pluralities. In his formal work on essence, claims about essentiality are represented by sentences involving the indexed operator \Box_F , where a sentence of the form $\Box_F\Phi$ says that Φ is true in virtue of the nature of the F s, i.e. of the objects to which F applies. Since Fine stipulates that F is rigid, i.e. applies to the same objects in any possible world and since he allows F to be any predicate, no matter whether meaningful or not, sentences involving \Box_F can straightforwardly be translated into claims about truth in virtue of the nature of pluralities. Note that Fine’s reliance on possible world is exclusive to his formal papers on essence, such as Fine (1995a) and that the most interesting and radical interpretation of his proposal for an Essentialist theory of modality does not rely on possible worlds at all.

¹⁴Ignoring the asymmetry of the notion ‘true in virtue of the nature of’ in this manner would be problematic if I were to discuss cases in which a proposition were to be true in virtue of the nature of another proposition. Since no such cases will be discussed, my lenient use of the abbreviation should lead to no confusion about the object- and proposition-arguments of the tvn-relation. Also note that ‘relation’ in ‘tvn-relation’ is not meant to be taken ontologically seriously. Nothing in the paper requires that ‘true in virtue of the nature of’ stands for a genuine relation like ‘is north of’.

is read as involving a universal quantification over all objects:

(NS) A proposition $\langle \Phi \rangle$ is metaphysically necessary if, and only if, for all objects x , $\langle \Phi \rangle$ is tvn-related to x .

According to (NS), being metaphysically necessary means being true in virtue of the nature of each object.

Note that it is not entirely clear from Fine (1994) what the intended range of the quantifier involved in this definition is. On the one hand, a fully reductive version of Essentialism, i.e. a version which delivers an analysis of modality which does not involve any unanalysed modality, would seem to require an actualist quantifier which only ranges over actually existing objects. On the other hand, a possibilist quantifier would allow Essentialists to rely on the essences of particular merely possible objects in order to straight-forwardly account for necessities involving them, if needed. Fine himself explicitly relies on possibilist quantifiers to state formalized versions of claims about essences in his formal papers on the logic of essence and its semantics, Fine (1995a) and Fine (2002), suggesting that his theory is not intended to be fully reductive in the sense just explained. I take it to be an open question about any version of the Essentialist definition of metaphysical necessity whether a formulation using the actualist quantifier is feasible. However, since nothing in the following discussion turns on this, I will remain neutral regarding the question throughout the paper.¹⁵

The second reading is captured by the following definition:

(NP) A proposition $\langle \Phi \rangle$ is metaphysically necessary if, and only if, $\langle \Phi \rangle$ is tvn-related to Ω .

The idea expressed by (NP) is that being necessary means being tvn-related to one particular plurality of objects, namely the maximal plurality Ω , the plurality which consists of all objects.

¹⁵Note that in a contribution to the discussion of the possibility of unrestricted quantification (Fine (2006)), Fine develops, but does not quite endorse, a view according to which quantifier domain extensions can be explained in modal terms, using a specific postulational modality. This might raise the question of whether this view is of any consequence for a Finean Essentialist definition of metaphysical necessity. However, since once again, the question whether the quantifiers in Essentialist definitions like (NS) should be read as unrestricted, or as relatively unrestricted as suggested by Fine, is orthogonal to the arguments made in this paper, I will not commit myself to any particular answer to this question and leave it at two brief remarks: First, according to Fine (2006), p. 33, footnote 12, postulational modality is not a genuine modality on a par with e.g. metaphysical modality. This means that it might not seriously threaten the reductiveness of an Essentialist definition of metaphysical necessity involving it. Second, a version of the definition using this non-standard view of quantification would have to face substantial questions about the essences of postulationally possible objects.

3 Why the Singular Reading has to be Rejected

(NS) can immediately be dismissed as a candidate definition of metaphysical necessity. A first problem with (NS) is that it completely ignores irreducibly plural cases of essential truth, cases in which a proposition is true in virtue of the nature of some objects, but not true in virtue of the nature of any particular object among them. Assume for example that the *aa* are all the sets. Essentialists may well claim that the proposition \langle The *aa* form a proper class \rangle is true in virtue of the nature of the *aa*, i.e. of all sets plurally, but they may reasonably deny that the same proposition is true in virtue of the nature of any single set. The proposition would then also fail to be true in virtue of the nature of each (singular) object and hence could not satisfy the right-hand side of (NS). This means that if there are irreducibly plural essential truths of this sort, then (NS) cannot account for their metaphysical necessity.

A second and more fundamental problem with (NS) is that almost no proposition is true in virtue of the nature of each particular object. Consider an object which is distinct from Xanthippe, but which is not essentially connected to Xanthippe, for example one of the pyramids of Giza. Is \langle Xanthippe is human, if she exists \rangle true in virtue of the nature of this particular pyramid? Certainly not! To paraphrase one of Fine's claims about a similar pair of objects, there is nothing in the nature of the pyramid which connects it to Xanthippe.¹⁶ But this means that there is an object which is not tvn-related to \langle Xanthippe is human, if she exists \rangle and that consequently, \langle Xanthippe is human, if she exists \rangle does not qualify as a metaphysical necessity according to (NS).

While I have just focused on one specific example of a commonly accepted metaphysical necessity, namely on \langle Xanthippe is human, if she exists \rangle , the above argument can easily be generalized to other metaphysically necessary propositions. This means that essentialists who think that (NS) tells us the whole story about metaphysical necessity have to live with an extensionally impoverished notion of metaphysical necessity, a notion which fails to apply to most of the propositions that philosophers usually take to have this status.

The argument can furthermore be generalized to the notions of conceptual and of logical necessity. It should be uncontroversial that \langle Bachelors are unmarried \rangle is a conceptual necessity, but this proposition is not true in virtue of the nature of e.g. the concept of addition. Likewise, if we presuppose classical logic, any proposition of the form $\langle\Phi \vee \neg\Phi\rangle$ should come out as logically necessary, but no particular proposition of this kind is true in virtue of the nature of the logical concept of negation, since negation alone does not

¹⁶See again Fine's example of Socrates and the Eiffel Tower in Fine (1994), p. 5.

guarantee its truth.

An especially hard-headed defender of (NS) might of course just bite the bullet and claim that we were mistaken to think that the relevant propositions were metaphysically necessary in the first place. However, this is certainly not an attractive move, since it would mean adopting a radically revisionary view of the notions of logical, conceptual and metaphysical necessity. This should suffice to illustrate why (NS) cannot be accepted.

4 The Plural Reading and the Monotonicity of the T_{vn}-relation.

(NP) defines metaphysical necessity in terms of truth in virtue of the nature of the plurality of all objects. This immediately raises the question of whether (NP) suffers from a problem similar to the second problem with (NS) which I have described above. Is it plausible to assume that all the propositions which we usually take to be metaphysically necessary are tvn-related to Ω ?

In order to answer this question, we have to first take a stand on what it means to say that a proposition is true in virtue of a plurality of objects rather than in virtue of the nature of a single object. In the singular case, we should expect the tvn-relation to at least hold between an object and those propositions which attribute an essential property of the object to it. If we assume that the notion of ‘true in virtue of the nature of’ works the same way in the plural case, then it should, minimally, also capture the essential properties of the relevant plurality. To name just one plausible example of such an essential property: it seems that for any objects xx , it is essential to them that they are identical to the xx , or, to put it differently, that any plurality consists of the objects it consists of.

The crucial question in the current context however is a different one, namely the question of whether for any objects xx , the xx are essentially such that the objects among them have the properties which are essential to them. To come back to the above example, is it the case that propositions like \langle Xanthippe is human, if she exists \rangle , i.e. propositions which state the essential properties of a particular object, are true in virtue of the nature of the plurality of all objects? If we focus on the essential properties of pluralities themselves and not on those of their component objects, then it indeed seems that this is not the case.

While it seems that (NP) suffers from a problem which parallels the second problem with (NS), there is a solution to the problem in case of (NP). The problem cases for (NS) presented in the previous section were based on intuitions about essentiality which

Fine relies on in Fine (1994). Since Fine does not discuss plural essence in that paper, the simple extrapolated view of how the tvn-relation works in plural cases, which I have just introduced, may be argued to be overly simplistic. The only requirement that view places on instances of the relation in both singular and plural cases is that it has to reflect the essential properties of singular objects, or of pluralities of them.

There is a different view which renders (NP) immune to the problem cases discussed above. The view I am alluding to is not discussed in Fine (1994), but hinted at in a parenthetical remark in Fine (1995c). There, Fine writes that ‘[a] necessary truth can be taken to be a proposition that is true in virtue of the identity of all objects [...] (*not that all objects [...] need be relevant*)’ (Fine (1995c), p. 56, my emphasis.).

This quote may sound puzzling or even contradictory. How could it be the case that a proposition is true in virtue of the nature of all objects, but that not all of them are relevant? An answer can be found in Fine’s formal work on the logic of essence. Fine’s system E5 contains the axiom II.V, which says that if the things that are F s are also G s, then if a proposition is true in virtue of the nature of the F s, it is also true in virtue of the nature of the G s.¹⁷ This axiom in effect says that the notion ‘truth in virtue of the nature of’ is monotonic. Accordingly, Correia proposes to supplement Fine’s definition with a *principle of monotonicity*, which says the following:

(PoM) If a proposition $\langle \Phi \rangle$ is true in virtue of the nature of xx , then for any plurality of objects yy which contains xx , $\langle \Phi \rangle$ is true in virtue of the nature of yy .¹⁸

I will call the combination of (NP) and (PoM) (NP+PoM). Given (PoM), any proposition which is true in virtue of the nature of an object is also true in virtue of the nature of the plurality of all objects Ω . To see why this solves the problem raised in the previous section for (NP), consider again the proposition $\langle \text{Xanthippe is human, if she exists} \rangle$. This proposition is arguably true in virtue of the nature of Xanthippe. Given (PoM), it is also true in virtue of the nature of Ω . This means that the instance of (NP) for $\langle \text{Xanthippe is human, if she exists} \rangle$ is satisfied, which in turn means that the proposition is (correctly) classified as a metaphysical necessity.

Generally, as long as a proposition is tvn-related to at least one object or one plurality, (PoM) guarantees that it qualifies as metaphysically necessary by the standard set by

¹⁷Stated formally using Fine’s essence-operator \Box_F : $F \subseteq G \rightarrow (\Box_F \Phi \rightarrow \Box_G \Phi)$. See Fine (1995a), p. 247.

¹⁸See Correia (2012), p. 640. The notion of containment is understood in the following way: The yy contain the xx if, and only if, for every object z , if z is among the xx , z is also among the yy . Note that the principle of monotonicity is not motivated in Correia (2012), but simply introduced as a part of Fine’s essentialist theory of modality.

(NP). Since the usual examples of essential truths are predications involving an object or a plurality and one of its essential properties and since the relevant objects and pluralities are usually assumed to be tvn-related to these propositions, the example generalizes.

(PoM) could only fail to do its job in cases in which a proposition should be classified as necessary, but still failed to be true in virtue of the nature of *any* object or plurality of objects. However, admitting such cases seems to go against the spirit of an Essentialist theory of modality of the sort discussed in this paper. The very idea of such a theory is that all necessities can be accounted for in terms of the essences of objects, or, more specifically, in terms of the notion ‘true in virtue of the nature of’ as applied to objects.¹⁹

5 Three Equivalent Finean Definitions of Metaphysical Necessity?

Since (NS) has to be ruled out, essentialists are left with either (NP+PoM) or one of two alternative essentialist definition of necessity, which I will now introduce. The first of these two has been accepted as true to the intention behind Fine (1994)’s original proposal by Correia (2005), Fine (2002), Rosen (2010), Teitel (2017), and others and has become the de facto standard in the literature:

(NE) A proposition $\langle \Phi \rangle$ is metaphysically necessary if, and only if, there is a plurality of objects xx , such that $\langle \Phi \rangle$ is tvn-related to xx .

Correia (2012) introduces the second definition, a variant of (NE) which relies on the

¹⁹Given this object-centric understanding of the Essentialist theory, cases of empty essential truth, cases in which a proposition is true in virtue of the nature of no objects at all, stick out as somewhat bizarre. Note however, that Fine allows these cases in the formal system defined in Fine (1995a) and in fact suggests that the empty case can be used to define conceptual necessity. While it does indeed make sense to allow cases in which the F in Fine’s ‘ \square_F ’ operator applies to no objects at all in the context of a logic of essence, e.g. for technical reasons, or because the logic is supposed to cover all conceivable applications of the operator, it is hard to make intuitive sense of these cases if the focus is really just on the essences of objects, as just suggested. After all, it seems that if there are no objects, there are no essences and to assume otherwise would appear to amount to the mistake of objectifying nothing, the same mistake which Carnap (1959) famously attributed to Heidegger. I believe that standing their ground and denying the existence of cases of empty essential truth is the best response to the threat from empty essential truths to (PoM) available to object-centric Essentialists. Note that Essentialists who takes into account cases of generic essence, as suggested by Correia (2006), can give a less radical response to the problem. Based on a generic-friendly reformulation of (PoM) which takes into account the idea that propositions can be generically true in virtue of the nature of what F is, where F is a predicate, can simply argue that empty essential truths are propositions which are true in virtue of the nature of an empty predicate. The threat to (PoM) from empty essential truths can hence be defused by both an object-centric and a generic-friendly version of Essentialism based on (NP).

notions of basic essentiality and of logical consequence instead of on Fine’s notion ‘true in virtue of the nature of’:

(NC) A proposition $\langle \Phi \rangle$ is metaphysically necessary if, and only if, for some xx , $\mathfrak{B}(xx) \vdash \langle \Phi \rangle$.²⁰

According to (NC), a proposition is metaphysically necessary if, and only if, there is a plurality xx whose basic nature logically entails the proposition.²¹ The *basic nature* $\mathfrak{B}(xx)$ of a plurality of objects xx is the plurality of propositions containing all those propositions which are basically essential to either xx itself, to a sub-plurality of xx or to a particular object that is part of xx .²² The notion of basic essentiality in turn is adopted as a primitive and Correia relies on the notion to define both Fine’s notion ‘truth in virtue of the nature of’ and the notion of derivative essentiality, which I am not going to further discuss here.²³

Neither (NE), nor (NC) suffers from the discussed problems which proved fatal for (NS) and which also seemed to affect (NP) without (PoM). That the proposition $\langle \text{Xanthippe is human, if she exists} \rangle$ is true in virtue of the nature of/belongs to the basic nature of Xanthippe suffices to render it metaphysically necessary if either (NE) or (NC) is accepted.²⁴

There seems to be no good reason to dismiss any of the three definitions as inadequate. This could mean two things: First, that Essentialists could end up with a different theory of modality, depending on which definition they pick, or second, that the choice between the three candidate-definitions simply makes no difference. As it turns out, the

²⁰See Correia (2012), p. 649. I follow Correia’s use of the symbol \vdash for the notion of logical consequence at work in his theory.

²¹Correia also relies on a notion of relativized logical consequence, but the notion of logical consequence involved in his definition of metaphysical necessity is unrelativized. See Correia (2012), p. 647 for the definition of the relativized notion.

²²See Correia (2012), p. 649.

²³See definitions (11) and (12), Correia (2012), p. 248.

²⁴Note also that all three remaining definitions are fully compatible with the assumption that possibility is the dual of necessity. The definition of possibility corresponding to (NE) for example is the following: A proposition $\langle \Phi \rangle$ is metaphysically possible if, and only if, there is no plurality of objects xx , such that $\langle \neg \Phi \rangle$ is tvn-related to xx . This is noteworthy since according to Yates (2014), p. 415, naive powers or dispositional theories of modality, i.e. theories which explain the possibility of $\langle \Phi \rangle$ in terms of the existence of a power or disposition to bring about Φ , entail that there are propositions which are both necessarily true and possibly false, given certain plausible background assumptions about powers and the assumption that possibility is the dual of necessity. Given the Essentialist definition of possibility matching (NE), a proposition cannot be possibly false and necessary at the same time, since this would require there to both be and not be a plurality to which the necessary proposition is tvn-related. The accounts of possibility based on (NC) and (NP+PoM) rule out these cases for similar reasons. This illustrates an interesting contrast between naive powers or dispositional theories and essentialist theories of modality.

choice indeed makes no difference in at least one respect, namely regarding the extent of metaphysical modality: It can be proven that the three definitions are extensionally equivalent, i.e. that all three definitions give us exactly the same metaphysical necessities and, given the standard assumption that these modal notions are interdefinable, the same possibilities, impossibilities, and so on.

Let us first look at (NP+PoM) and (NE). Assume that (NP) is satisfied, that is, that we have a proposition $\langle \Phi \rangle$, which is true in virtue of the nature of Ω . Since we assume that the tvn-relation is monotonic, i.e. since we accept (PoM), this can mean three things. First, $\langle \Phi \rangle$ is true in virtue of the nature of a single object, second it is true in virtue of the nature of a plurality of objects not identical to Ω , or third, that it is true in virtue of the nature of Ω . Given that we presuppose that single objects can also be treated as (limit cases of) pluralities, (NE) is satisfied in all three cases. Since $\langle \Phi \rangle$ was an arbitrary proposition, this means that (NE) is satisfied, if (NP) is, assuming that it holds together with (PoM).

For the other direction of the equivalence, assume that $\langle \Phi \rangle$ satisfies (NE), i.e. that there is a plurality of objects aa , such that $\langle \Phi \rangle$ is true in virtue of the nature of the aa s. By (PoM), $\langle \Phi \rangle$ is also true in virtue of the nature of Ω . Since $\langle \Phi \rangle$ was again arbitrary it follows that (NP) is satisfied, if (NE) is satisfied and therefore also that (NE) is satisfied if, and only if, (NP) is satisfied, assuming that (NP) is held in conjunction with (PoM). This concludes the simple proof for the equivalence of (NE) with (NP+PoM).

If we follow Correia's suggestion to treat 'true in virtue of the nature of ...' as a notion that is definable in terms of his notion of basic nature, (NP+PoM) is also equivalent to (NC). According to Correia's definition of 'true in virtue of the nature of ...', a proposition $\langle \Phi \rangle$ is true in virtue of the nature of the xx iff $\mathfrak{B}(xx) \vdash_{\log(xx)} \langle \Phi \rangle$.²⁵ Given this definition, the proof is again simple. Assuming that (NP) is satisfied, we have $\mathfrak{B}(\Omega) \vdash_{\log(\Omega)} \langle \Phi \rangle$, which entails that there is a plurality xx , such that $\mathfrak{B}(xx) \vdash \langle \Phi \rangle$, i.e. that (NC) is satisfied, since in Correia's theory, a proposition is a logical consequence of some propositions relative to some logical concepts if, and only if, it is a logical consequence simpliciter of these proposition. For the other direction, we only need to note that $\vdash_{\log(xx)}$ is monotonic, which means that if there is a plurality xx , such that $\mathfrak{B}(xx) \vdash_{\log(xx)} \langle \Phi \rangle$, which is the case if (NC) is satisfied given the equivalence just mentioned, then it is also the case that $\mathfrak{B}(\Omega) \vdash_{\log(\Omega)} \langle \Phi \rangle$. Hence, (NP) is satisfied by a pair of a plurality of objects and a proposition if, and only if, the same pair satisfies (NC). We can therefore conclude that (NP+PoM), (NE) and (NC) are extensionally

²⁵See definition (12), Correia (2012), p. 648. The notion of relative logical consequence used here is defined on p. 647, *ibid*.

equivalent.²⁶

6 Why Essentialists Should Adopt (NC)

Where does all this leave someone who wants to adopt an Essentialist definition of necessity? Given the equivalence-argument of the previous section, one might think that while aspiring Essentialists have a choice of three different definitions, the choice simply does not matter, since all three definitions deliver exactly the same extent of metaphysical modality. This would however be a mistake, since extensional equivalence is, at least in this context, not everything. In this section, I will argue that Essentialists should settle for (NC), Correia's interpretation of the Essentialist definition. The argument is based on a further distinction, namely that between three different readings of Fine's notion of 'true in virtue of the nature of', the notion involved in both (NE) and (NP+PoM). Based on that distinction, I will argue that neither of the three readings is adequate. Since the reasons are the same in case of (NE) and (NP+PoM), the discussion focuses only on (NE).

Let me however begin with a small explanation of the dialectical situation. Correia (2012) already gives Essentialists two reasons for adopting (NC). First, he shows that the rule-based account of essence which he combines with (NC) allows Essentialists to account for the distinction between two sorts of plural essentiality, brute and derivative essentiality. Brute plural essential truths are propositions which capture the plural essence of some objects, whereby the fact that they have this status cannot be explained in terms of the individual essences of those objects. Derivative plural essential truths on the other hand are propositions which express plural essential truths which are such that the fact that they have this status can be explained in this manner.

Second, Correia's version of Essentialism fully develops Fine's suggestion that the Essentialist definition of metaphysical necessity can serve as a template for definitions of conceptual and logical necessity. These two advantages notwithstanding, recent discussions of Essentialism still de facto treat (NE) as the canonical version of the Essentialist definition of necessity.²⁷ The purpose of this section is to further the case for (NC)

²⁶It should again be stressed that Correia treats 'true in virtue of the nature of . . .' as a defined notion, while the notion is treated as a primitive in both (NP) and (NE). This means that the proof for the equivalence of (NC) and (NP+PoM) leaves some room for disagreement, since an Essentialist who accepts (NP+PoM) could, at least in principle, reject Correia's definition of the notion and thereby also the proof.

²⁷See for example Livingstone-Banks (2017) and Teitel (2017). I believe that the focus on (NE) rather than on (NC) makes a difference regarding the arguments of both of these papers. I cannot go into details here, since this would take too much space and would lead me too far away from the main

and more generally for Correia’s version of Essentialism by arguing that even if we focus just on metaphysical necessity, Essentialists should prefer (NC) to both (NE) and (NP+PoM). Now on to the arguments.

In Fine (1995c), the companion-piece to the more influential Fine (1994), Fine distinguishes between the *constitutive* and the *consequential* part of the essence of an object: ‘An essential property of an object is a constitutive part of the essence of that object if it is not had in virtue of being a consequence of some more basic essential properties of the object; and otherwise it is a consequential part of the essence.’ (Fine (1995c), p. 57.) In other words, their constitutive essences consist of the ‘more basic essential’ properties of objects, while their consequential essences consists of the properties which an object has, because that it does is logically entailed²⁸ by its having one or more of its constitutively essential properties. Note that if we assume that ‘more basic’ in Fine’s quote means ‘at least as basic as’ and not ‘strictly more basic’, every property which is constitutively essential to some objects is also consequentially essential to them. This immediately follows from the fact that logical entailment is reflexive.²⁹

The distinction gives us two readings of Fine’s notion ‘true in virtue of the nature of’, i.e. of what I have (in an ontologically non-committal way) sometimes referred to as the ‘tvn-relation’ throughout this paper: A proposition which expresses an essential truth is *constitutively true in virtue of the nature of* some object if, and only if, it attributes a property to the objects which is a constitutive part of their essence, and it is *consequentially true* otherwise.

argument of this section. To give just one example, let me very briefly remark on one of Livingstone-Banks’s arguments from section 4.1 of his paper. In this section, he argues, making a point not completely dissimilar to a point to be made later in this section, that Fine’s proposal for a restriction on the notion of consequential essence fails to rule out certain implausible essential truths, such as e.g. that Marie Curie is essentially such that she is human and $2 + 2 = 4$. Livingstone-Banks then argues that Essentialist who work with (NE) can avoid this problem by adopting a reinterpretation of Fine’s distinction between constitutive and consequential essence which he introduced earlier in his paper. An Essentialist theory of modality built around Correia’s (NC) does not face the same problem in the first place. Instead of relying on Fine’s distinction, it relies on one primitive, constitutively essentialist notion of basic nature and a notion of logical consequence. This allows Essentialists to argue that Livingstone-Banks’s example poses no problem, since the proposition saying that Marie Curie has the property of being such that she is human and that $2 + 2 = 4$ is not part of her basic nature.

²⁸That the notion of consequence is the logical notion of consequence is clear from the context. See Fine (1995c), p. 56.

²⁹I.e. speaking, as Fine does, of logical consequence as a relation between property-instantiations, the claim is that a ’s having property F trivially entails a ’s having property F . Note that, as Fine (1995c), p. 57 points out, the reverse implication from expressing a consequentially essential truth to expressing a constitutively essential truth does not generally hold. Note furthermore that the two notions of essence would be mutually exclusive if we were to read ‘more basic’ as ‘strictly more basic’. I here adopt the non-strict reading since it simplifies the formulation of the consequential reading of (NE) and of (NP), which will be discussed shortly.

Fine has a clear preference for the notion of consequential essence, since he thinks that the constitutive notion is problematic.³⁰ Fine's recommendation to 'work as far as possible with the consequentialist[sic!] notion' (Fine (1995c), p. 58) suggests that one should read (NE), or (NP) respectively, as involving the consequential notion of 'true in virtue of the nature of', but this reading is subject to a serious problem. To bring out the problem, we have to go back and take another look at Fine (1994)'s argument against the modal definition of essentiality.

Fine's argument presupposes particular intuitions about the essences of objects. With the distinction between constitutive and consequential essence kept in mind, there is an important question to answer, namely whether these intuitions are in accord with Fine's preference for the consequential notion. If they are not, Essentialists who adopt the consequential reading of (NE) or (NP) lose the main motivation for their theory of modality.³¹

Fine's argument is based on the assumption that the following four essentialist claims are false:

1. It is true in virtue of the nature of any object that it exists.
2. It is true in virtue of the nature of any object that Φ , where $\langle \Phi \rangle$ is any metaphysically necessary proposition.
3. It is true in virtue of the nature of Socrates that he is distinct from the Eiffel Tower.
4. It is true in virtue of the nature of Socrates that he is an element of the singleton set $\{\text{Socrates}\}$.

The problem is that this assumption cannot be fully upheld under the consequential reading of 1-4: Assuming this reading, 1 is true, since that Socrates exists is a classical logical truth and as such is consequentially true in virtue of the nature of any objects. Furthermore, while 2 can be claimed to be false in its full generality, all instances of 2 in which $\langle \Phi \rangle$ expresses a logical truth, such as for example $\langle \text{The number two is prime or not prime} \rangle$, still are true according to the consequential reading. That they are conflicts with the same intuition which lead Fine to reject 2, namely that Socrates is not essentially

³⁰See Fine (1995c), p. 57-8 for his arguments to one of which I will come back later.

³¹Unless of course there were a notion of essence definable in terms of consequential essence which supported the relevant essentialist intuitions. The prospects for that are however dim, since both Fine (1995c), p. 58 and Koslicki (2012), p. 193-5 argue that constitutive essence is not so definable and since there is no relevant alternative notion. Fine (1995c)'s own proposal to restrict the notion of consequential essence will be discussed later in this section.

connected to objects like the number two. 3 and 4 on the other hand are false under the consequential reading, just as Fine's argument requires.

That the consequential notion of essence undermines the objections to 1 and 2 is a problem, since as a motivation for Essentialism, the four objections work best as a complete package. Taken together they form a coherent picture of what Essentialists think is wrong with the modal definition of essentiality, but on their own, each could simply be considered a relatively harmless anomaly of the modal definition.³² The objections to 1 and 2 in particular complement the other two, since the latter are based on more particular assumptions about the essences of specific kinds of objects, while the former raise more general overgeneration- and triviality-problems.

Could it perhaps still be argued that Fine's argument works just as well without the objections to 1 and 2? It is sometimes assumed in the literature that the objection against 4 and the contrasting affirmation of the claim that {Socrates} essentially has Socrates as an element are the main driving force of his argument.³³ While this particular objection indeed resonates with many philosophers who are sympathetic to essentialist views, it would be a mistake to think that it and the objection against 3 alone suffice to motivate Essentialism. Here is why.

The objections to 3 and 4 are supported by an intuition which is particular to Fine's theory of essence. In both claims, a particular object, Socrates, is linked via an internal relation to an object, to which it is, according to Fine, not essentially connected. What does Fine mean by that? Fine (1995b) suggests an answer. In this paper, Fine proposes a general principle, according to which objects ontologically depend on any object mentioned in a proposition which captures their essence. (See Fine (1995b), p. 275) The asymmetry between Socrates and {Socrates} regarding their essential properties pointed out by Fine hence can be claimed to derive from an asymmetry of ontological dependence: {Socrates} ontologically depends on Socrates, but Socrates does not ontologically depend on {Socrates}, so Socrates's being an element of {Socrates} is true in virtue of the nature of the former, but not the latter. Likewise, 3 is false, because Socrates does not ontologically depend on the Eiffel Tower.

3 and 4 stand and fall with Fine's principle linking essence and ontological dependence. A defender of the modal definition who rejects the particular patterns of ontological dependence presupposed in Fine's objections to 3 and 4,³⁴ or more generally the notion

³²In discussion of essence which pre-date Fine (1994), this seems to be a common attitude towards objections of this sort. See for example the discussion of extraneous trivial essential properties in Forbes (1986), p. 4.

³³See e.g. Roca-Royes (2011), p. 66.

³⁴Based on a view about the iterative conception of set developed in Incurvati (2012), Wildman (2013),

of ontological dependence itself, can evade these two objections. But even friends of ontological dependence might have reasons to doubt Fine's principle. Wilson (2016), section 3.1 raises the following problem case:

Quarks are (for all we know) ontologically fundamental particles which come into existence in groups, e.g. in triplets to form less fundamental composed entities such as protons. Now consider three quarks, q_1, q_2 , and q_3 which compose a proton p . For all we know about the essence of quarks, it is true in virtue of the nature of q_1, q_2 , and q_3 that they compose p . According to Fine's principle, this means that q_1, q_2 , and q_3 ontologically depend on p , since p is mentioned in a proposition capturing their essence. The problem is that this conflicts with the assumption that quarks are ontologically fundamental particles, since ontologically fundamental particles ontologically depend on no other entities.³⁵

Since the main motivation for Essentialism is under threat, it is not in the Essentialists's best interest to adopt the consequential reading of (NE). However, Fine suggests a way to safeguard (NE) against this problem which still allows one to accommodate his preference for the consequential notion of essence. Fine (1995c), p. 58-9 introduces a restricted notion of consequential essence which is designed to address exactly the problem raised in my discussion of Fine's objection to 2.

Fine proposes a procedure which allows Essentialists to 'generalize away' (Fine (1995c), p. 59) logical truths which introduce extraneous objects, i.e. objects which are not essentially connected to the relevant objects, into their consequential essence: In a plural setting, the idea is that for any objects xx and proposition of the form $F(aa)$, where F is a predicate which might be logically complex and aa is a constant referring to one or more objects, if $F(aa)$ is consequentially true in virtue of the nature of xx and if furthermore for any yy , $F(yy)$ is also consequentially true in virtue of the nature of xx , then $F(aa)$ is not restrictedly consequentially true in virtue of the nature of xx . Reading (NE) in terms of this restricted consequential notion of 'truth in virtue of the nature of' solves the problem: 1. and 2. are not restrictedly true in virtue of the nature of Socrates, so the restricted consequential reading of (NE) leaves the main motivation for

p. 775-781 does exactly this. He argues that Fine's contrastive intuition is not, as one might assume, supported by the widely-accepted iterative conception of set, but rather presupposes a metaphysical priority-thesis about sets and their members. See Skiles (2015) for a critical discussion of Wildman's argument.

³⁵It should be pointed out that the link between ontological dependence and relative fundamentality on which Wilson relies in her argument, while arguably part of the orthodoxy in the discussion of ontological dependence (see e.g. Bennett (2017), Schaffer (2010), Koslicki (2013)), is not entirely uncontroversial. Barnes (2017) argues that there are symmetric cases of ontological dependence, cases in which two objects mutually ontologically depend on each other. As a consequence, she rejects the idea that ontological dependence implies relative fundamentality, since the latter is asymmetric.

Essentialism intact.

So far, so good, but the problem is that the restricted reading of (NE) burdens Essentialists with a different problem. Fine's restriction-procedure is perfectly general and applies to the essential truths about any object or objects. But this means that while propositions expressing logical truths like $\langle 2 = 2 \rangle$ or $\langle \text{The Eiffel Tower is painted in three shades or the Eiffel Tower is not painted in three shades} \rangle$ are not restrictedly consequentially true in virtue of the nature of e.g. Socrates, the same also holds for any other object or objects, including e.g. the number two and the concept of identity, or the Eiffel Tower and the concepts of disjunction and negation. As a consequence, since (NE) requires metaphysical necessities to be true in virtue of the nature of some objects, no instance of a logical truth is metaphysically necessary according to the restricted consequential reading of this definition. This is obviously unacceptable, since these propositions are paradigm examples of metaphysical necessities.³⁶

Both the consequential and the restricted consequential reading of (NE) face serious problems. One might think that these problems could be avoided by simply adopting a constitutive reading of (NE), but this third reading faces its own problem, namely that it is unfit to account for the metaphysical necessity of logically complex propositions.³⁷ To see the problem, take for example the conjunctive proposition $\langle \text{Socrates is human if he exists and the Eiffel Tower is a non-living, concrete thing if it exists} \rangle$. This proposition expresses a metaphysical necessity, since both its conjuncts do. Given the constitutive reading of (NE), this means that it has to express a constitutively essential truth about some objects, because otherwise, it would fail to be metaphysically necessary. Based on familiar patterns of Finean reasoning, we can rule out that it expresses a singular constitutive essential truth about any of the objects and concepts it is about, since Socrates, the Eiffel Tower and the concept of conjunction are not essentially connected to each other. This means that to satisfy (NE), the proposition has to express a plural essential truth about these three objects. Following Correia (2012), there are two kinds of plural essential truths, brute plural essential truths, i.e. plural essential truths about some objects whose being essential truths cannot be 'explained in terms of the individual nature of these objects' (Correia (2012), p. 643.) and derivative plural essential truths, essential truths whose being essential truths can be so explained. Correia's (tentative)

³⁶Note that, unlike its instances, Fine's procedure leaves the corresponding universal generalizations untouched so that e.g. $\forall xx(Fxx \vee \neg Fxx)$ can remain a restricted consequentially essential truth about e.g. the logical concepts of universal quantification, negation, and disjunction, even after its instances are generalized away. This does however not address the problem at hand which specifically concerns the instances of these schematic logical truths.

³⁷See Fine (1995c), pp. 57-8 and Correia (2012), p. 641-3.

example of a brute plural essential truth is $\langle \text{Socrates is distinct from the Eiffel Tower} \rangle$, which expresses an essential truth about Socrates and the Eiffel Tower taken together, but not about any of the two objects considered on its own. The reason again is that, following Fine (1994), no essential connections obtain between the two objects. This proposition can be classified as a brute plural essential truth about Socrates and the Eiffel Tower taken together, because its essential truth cannot be explained based on the individual natures of these two objects. In contrast, $\langle \text{Socrates is human if he exists and the Eiffel Tower is a non-living, concrete thing if it exists} \rangle$ belongs to the second category, the category of derivative plural essential truths, since there plausibly exists an explanation of why this proposition expresses an essential truth in terms of essential truths about Socrates, the logical concept of conjunction, and the Eiffel Tower.

The structure which an explanation of the constitutive essential truth of this proposition in terms of the essential truth of propositions about the three objects should take is clear: Conjunctions are true because their conjuncts are true and because of how conjunction works. Analogously, the conjunctive proposition which we are concerned with should express an essential truth about the three objects, because its conjuncts each express a singular essential truth about one of the objects and because of the essence of the remaining object, the concept of conjunction. There appear to be two possible ways to spell this out.

First, one might assume that the relevant proposition expressing an essential truth about conjunction is a universal generalization saying that for any two essentially true propositions, the conjunction of these two propositions is also essentially true.³⁸ But explaining the essential truth of the conjunctive proposition on this basis requires, speaking metaphorically, first instantiating the universally quantified essential truth about conjunction and then applying Modus Ponens in order to ‘infer’ the essential truth of the conjunctive proposition. The problem with this first idea is that the notion of constitutive essence, the notion with which we are exclusively concerned in the current context is, as Fine puts it, ‘logically inert:’ (Fine (1995c), p. 57) Read constitutively, ‘true in virtue of the nature of’ is not closed under logical consequence. Accordingly, that $\langle \Phi \rangle$ is a logical consequences of propositions which express constitutive essential truths does not guarantee that $\langle \Phi \rangle$ itself also expresses a constitutively essential truth. This means that the first proposal does not work.

The second proposal rejects the assumption that the essences of logical concepts are

³⁸Using propositional and second order quantification into the index of Fine’s essentialist operator, this can be stated more formally as follows: $\forall p, q((\exists F(\Box_F(p)) \wedge \exists G(\Box_G(q))) \rightarrow \exists H(\Box_H(p \wedge q)))$. Note that not all Essentialists might be prepared to adopt the sort of logic needed to state the logical form of this sentence.

expressible by propositions and instead assumes that their essences contain the (non-propositional!) rules of inference which govern their correct application. This is Fine’s preferred solution to the problem. (See Fine (1995c), p. 58.) Fine however does not explain how this assumption allows one to account for the essential truth of logically complex propositions without assuming a consequential, rather than a constitutive notion of essence. Essentialists who want to adopt (NE) or (NP) might perhaps try to further develop Fine’s idea, but this would arguably be a waste of their resources, since this is exactly what Correia (2012) has already done in developing his version of Essentialism which is based on (NC). It is hard to see how Fine’s idea could be developed within an alternative version of the theory based on (NE) or (NP+PoM) which exclusively relies on a constitutive notion of essence without turning it into more or less a copy of Correia’s version. Since his version is readily available to the aspiring Essentialist, there seems to be no good reason to insist on (NE) or (NP+PoM) instead of (NC).

To sum up the main arguments of this section, there are three readings of (NE) and (NP+PoM) respectively, one consequential, one restricted consequential, and a constitutive reading. The first partially undermines the main motivation for Essentialism, Fine’s argument against the modal definition of essentiality, the second cannot account for the metaphysical necessity of certain logical truths. Finally, the third and most promising proposal is superseded by Correia’s theory which incorporates (NC). Based on these arguments, my recommendation to prospective Essentialists and philosophers who want to critically engage the Essentialist definition of necessity is to focus on (NC).³⁹

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³⁹Sections 2-4 of this paper are based on parts of a chapter of my dissertation ‘Metaphysical Modality and Essentiality’, which I defended in December 2013 at the University of Geneva. Thanks again to my supervisor Kevin Mulligan and the members of my PhD-jury Fabrice Correia, Fraser MacBride, Peter Simons and Wolfgang Spohn. Parts of the paper were presented at the eidos seminar at the University of Geneva and at the Fine Conference in Varano Borghi. Thanks to everyone who discussed the paper with me on these occasions, especially to Kit Fine for his reply in Varano Borghi, to Philipp Blum, Peter Fritz, Olivier Massin, and Nathan Wildman for suggestions which led to important improvements, and to three anonymous referees for *Philosophical Studies* and another journal. I gratefully acknowledge financial support by the European Community’s Seventh Framework Programme FP7/2007-2013 under grant agreement no. FP7-238128 and the Swiss National Science Foundation (project ‘Indeterminacy and Formal Concepts’, Grant-Nr. 156554, University of Geneva, principal investigator: Kevin Mulligan).

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