A Hyperintensional Account of Metaphysical Equivalence

Abstract

This paper argues for a particular view about in what metaphysical equivalence consists: namely, that any two metaphysical theories are metaphysically equivalent if and only if those theories are *strongly* hyperintensionally equivalent. It is consistent with this characterisation that said theories are *weakly* hyperintensionally distinct, thus affording us the resources to model the content of propositional attitudes directed towards metaphysically equivalent theories in such a way that non-ideal agents can bear different propositional attitudes towards metaphysically equivalent theories.

1. Introduction

Though there is widespread disagreement regarding which, if any, extant theories in metaphysics are metaphysically equivalent, there is general agreement that there is such a phenomenon as metaphysical equivalence and that we have a rough idea what it is. Thus when Hirsch (2002; 2005; 2009), Lowe and McCall (2003) and Miller (2005b) argue that endurantism[[1]](#footnote-1) and perdurantism[[2]](#footnote-2) are metaphysically equivalent theories of persistence, or Benovsky (2014) argues that trope theory and universalism are equivalent theories of properties, or when Putnam (1987), Carnap (1950) and Balaguer (forthcoming) argue that mereological nihilism[[3]](#footnote-3) and mereological universalism[[4]](#footnote-4) are metaphysically equivalent, to name just a few examples, even though we might disagree with these particular claims we understand what their defenders intend to be claiming. Or we think we do. While there has been significant discussion in first-order metaphysics about whether certain theories are metaphysically equivalent or not, there has been less discussion of what metaphysical equivalence consists in. It is to this question that this paper addresses itself.

 Intuitively, theories are metaphysically equivalent if they deploy different sets of sentences to describe the very same features of any world. The thought is that if theories T and T\* are metaphysically equivalent, then not only are defenders of T and defenders of T\* not disagreeing when each argues for their preferred theory, but each is, in fact, agreeing with the other. So if you think it is possible that there are two theories that are empirically equivalent (that is, make the same set of predictions in every possible world) and yet each is made true by distinct, but necessarily co-instantiated at all and only the same locations,[[5]](#footnote-5) properties, then you should think that said theories *fail* to be metaphysically equivalent in the sense I intend. Given this, it is unsurprising that when we look to first-order disputes about whether some particular pair of theories is metaphysically equivalent we find extensive discussion regarding whether said theories are inter-translatable.[[6]](#footnote-6) Indeed, Miller (2005a), suggests that if two theories are correctly inter-translatable—if there is a function that maps the sentences of one theory onto the sentences of the other theory in a way that is a correct translation—then said theories are metaphysically equivalent. The idea is that if there really is a *correct* translation then the two theories are saying the very same thing, and hence are metaphysically equivalent. Holding fixed that we know what a correct translation is, the question then becomes on what grounds we could reasonably come to believe that a purported translation is correct.

As far it goes that seems right. At bottom, to say that two theories are metaphysically equivalent is, at least on this understanding, to make a claim about meaning. Which claim about meaning one is making, however, is open to disagreement. After all ‘meaning’ is a notoriously elusive notion. Extensionalists once argued that meanings are exhausted by extensions, where the extensions of names are objects, predicates are properties, and sentences are truth-values. Extensionalists were overtaken by intensionalists, who argued that appealing to extensions cannot adequately capture all meaning. Intensionalists suppose that meanings are exhausted by intensions, where an intension of an expression is a function from possible worlds to extensions. Of late, intensionalism has come under fire from those we might call *hyperintensionalists*, who argue that appealing to intensions is inadequate to capture all meanings. Hyperintensionalists argue that in addition to extensions and intensions, if we are to capture meaning in all its glory we need to appeal to hyperintensions. *Hyperintensions* are theoretical beasts, posited to play some particular role in fine-graining meaning; what hyperintensions are, depends on how one chooses to model hyperintensionality. Some take hyperintensions to be functions from possible *and impossible* worlds, to extensions.[[7]](#footnote-7) Others take hyperintensions to be functions from possible and impossible worlds, to A-intensions, where, in turn A-intensions are functions from possible worlds to intensions.[[8]](#footnote-8) Finally, others take hyperintensions to be structured entities—entities structured in such a way that their structure in some way reflects the structure of the relevant expression.

In what follows it is argued that if we are to accommodate some central intuitions about the phenomenon of metaphysical equivalence we need to appeal to hyperintensions. These arguments will be brief, and familiar; arguments of this kind are already found in the literature on sentence meaning and belief ascriptions. The aim is to remind the reader of these considerations and then to move on to more interesting territory: namely, to argue that we ought to define metaphysical equivalence in terms of the equivalence of what I call strong hyperintensions. Strong hyperintensional distinctions track genuinely worldly distinctions. If you like, strong hyperintensional distinctions are those that God needs in order to think about the way the world is (and could be), on the assumption that God is omniscient and ideally rational. Weak hyperintensions, by contrast, are those we only need in order to individuate the mental states of agents who are ignorant or non-ideally rational in certain ways. God has need of weak hyperintensions only insofar as he/she is inclined to think about the mental states of ignorant or non-ideally rational beings. *Mere* weak hyperintensional distinctions do not track any genuinely worldly distinctions, but are entirely the product of our representational systems.

 The paper begins, in Section 2, by setting out three desiderata for an account of metaphysical equivalence. In light of these desiderata, in Section 3 it is argued that we ought to define metaphysical equivalence in terms of strong hyperintensional equivalence. To do so a distinction is drawn between strong and weak hyperintensions, and a model of these is provided which shows how defining metaphysical equivalence in terms of strong hyperintensional equivalence meets all three desiderata.

2. Desiderata for an account of metaphysical equivalence

I suppose that theories are (structured) sets of sentences such that what those sentences, jointly, express, can be true, or false, at a world. So I assume not only that the sentences that compose a theory can be individually true or false, but, in addition, that the theory itself has an extension—a truth value—at each world. A theory is true at a world iff what that theory says, is true at that world. Two theories are metaphysically equivalent only if they express the same things. In what, though, does *saying the same thing* consist when it comes to metaphysical equivalence? To answer this question it is first necessary to introduce some distinctions.

It is common to distinguish extensional, intensional, and hyperintensional positions in sentences. Following Nolan (2013), I will say that a position in a sentence is extensional if any other expressions with the same extension can be substituted into that position without changing the truth-value of the sentence. A position in a sentence is intensional if it is not extensional, and expressions that are necessarily co-extensive are freely substitutable in that position without change in truth-value. A position in a sentence is hyperintensional if it is not extensional and not intensional, so that one can substitute necessary equivalents and fail to preserve the truth-value of the sentence.

Within standard possible world semantics the meaning of an expression is its *intension*, which is a function from possible worlds to extensions. The intension of a singular name tells us which object (if any) is the referent of that name at any given possible world. The intension of a predicate tells us which objects (if any) satisfy that predicate at any given possible world. And the intension of a sentence tells us which possible worlds (if any) the sentence is true at.

It has been widely argued that intensions, thus construed, are not sufficiently fine-grained to capture the meanings of all expressions. For instance, ‘2 + 2 = 4’ and ‘there are infinitely many primes’ have the same intension, yet seem to differ in meaning. This has prompted some to suggest that meanings are captured by hyperintensions (e.g., Nolan, 2013). Historically, the move from taking the meaning of an expression to be its extension, to taking the meaning of an expression to be its intension, followed the same pattern. When the extension of an expression is sufficient to capture its meaning, the context in which the expression appears is said to be an *extensional context*. When the intension of an expression is sufficient to capture its meaning, but its extension is not, the context in which the expression appears is said to be an *intensional context*. Intensional contexts include those in which we find modal operators like possibly and necessarily. Thus, it is natural to say that a *hyperintensional context* is one in which neither the extension of some expression, nor its intension, is sufficient to capture its meaning, and that only the hyperintension of the expression can do so. Hyperintensional contexts include those in which we find psychological operators such as ‘believes that’ ‘hopes that’ ‘fears that’ and so on, and perhaps also other contexts. While it is uncontroversial that there are intensional contexts, it is more controversial that there are hyperintensional contexts, and, if there are, what, exactly, hyperintensions are. This paper takes a stand on both these questions, as we will shortly see.

 In what follows, for simplicity, I will assume that the extensions of names are individuals, of predicates are properties, and of sentences are truth-values. Further, I will assume that intensions are functions from possible worlds to extensions. Then two sentences are intensionally equivalent iff they pick out the same set of possible worlds.

 It seems clear that it is a necessary condition for theories being metaphysically equivalent that those theories are intensionally equivalent. Metaphysically equivalent theories do not simply have the same extension (i.e. truth-value) in our world; they have the same extension in every possible world. Consider, for instance, the one-slice possible world. That is a world in which there is a single three-dimensional slice and nothing else, and there never were, nor ever will be, any other slices. This is a world in which eternalism[[9]](#footnote-9) is true and, on some characterisations of presentism,[[10]](#footnote-10) is it also a world in which presentism is true. Nevertheless, even if that world is the actual world it would not incline us to think that presentism and eternalism are metaphysically equivalent, so long as we think that there are possible multi-slice worlds in which eternalism is true and presentism is false, or possible worlds in which there exist a sequence of single-slices in which presentism is true and eternalism is false. So we should accept the following claim about the necessary conditions for two theories to be metaphysically equivalent.

NEC: Theories T and T\* are metaphysically equivalent only if T and T\* are intensionally equivalent.

Many theories in metaphysics are metaphysically necessary. In what follows I focus on the class of metaphysical theories that are necessarily true (i.e. true in every possible world) and the class of metaphysical theories that are necessarily false (i.e. false in every possible world). It is controversial which theories these are, but I assume that there are at least some. Every necessarily true metaphysical theory has the same extension at every world—namely, true. Then the intension of every necessarily true metaphysical theory will be the set of all possible worlds: hence all necessarily true metaphysical theories will be intensionally equivalent. Likewise, the intension of every necessarily false metaphysical theory will be the empty set, and hence all necessarily false metaphysical theories will be intensionally equivalent. I return to consider necessarily false metaphysical theories shortly; for now I want to focus on the necessarily true theories. In what follows I will suggest that any adequate account of metaphysical equivalence must meet two desiderata (D1 and D2) if such an account is to accommodate our most central intuitions regarding that phenomenon.

If you share my intuitions you will resist the thought that in virtue of their intensional equivalence *all* necessarily true metaphysical theories are metaphysically equivalent. Those who share this intuition will hold that intensional equivalence is necessary, but not sufficient, for metaphysical equivalence. More generally, if one shares the intuition that not all necessarily true metaphysical theories are metaphysically equivalent then one should agree that it is a desideratum for an account of metaphysical equivalence that it allows us to distinguish the intensionally equivalent theories that are metaphysically equivalent, from those that are not. Then one should embrace D1:

D1. Any account of metaphysical equivalence must be able to distinguish, from amongst the intensionally equivalent true theories, those that are metaphysically equivalent from those that are not.

Of course, this is just a special case of the more general idea, widely, but by no means universally, shared, that some necessarily true sentences, despite being intensionally equivalent, do not mean the same thing. Insofar as one finds it plausible that some necessarily true sentences have different meanings, one will, like me, find it plausible that some necessarily true metaphysical theories fail to be metaphysically equivalent.[[11]](#footnote-11)

Moreover, what is true of necessarily true sentences is, I contend, true of necessarily false sentences too. That is, just as we want to be able to distinguish necessarily true metaphysical theories that are equivalent, from those that are not, we also want to be able to distinguish necessarily false metaphysical theories that are equivalent, form those that are not. If so, we should endorse D2:

D2: an account of metaphysical equivalence ought to distinguish necessarily false metaphysically equivalent theories, from necessarily false metaphysically inequivalent theories.

Again, one might not share this intuition. There are those who think that even though there is good reason to distinguish between necessarily true intensionally equivalent sentences, no such distinctions are required amongst sentences that are necessarily false. Sentences that are necessarily false simply make no sense, and, it is right that, on reflection their intension is the empty set. I, like many others, do not find this thought compelling: even if presentism is necessarily false, its sentences do, jointly, seem to describe a scenario, albeit an impossible one, and the scenario they jointly describe seems different to the scenario jointly described by the sentences that jointly compose the theory of nihilism (on the assumption that nihilism is false of necessity).

 One might stop there. Accepting D1 and D2 is sufficient to motivate the account I offer in Section 3, which defines metaphysical equivalence in terms of strong hyperintensional equivalence. Nevertheless, there is a further desideratum that I think we ought to accommodate, which is the following:

D3: an account of metaphysical equivalence must be consistent with us being able to accommodate the hyperintensional nature of the psychological attitudes towards metaphysically equivalent theories.

One reason why hyperintensions are posited is because it seems clear that psychological attitudes create hyperintensional contexts into which one cannot substitute necessarily co-extensional sentences. Herbert can believe X and fail to believe Y where X and Y are intensionally equivalent sentences. Let us use the construction ‘x believes *that theory T’* as shorthand for the belief ascription we get by concatenating ‘x believes that’ with the sentences that jointly compose theory T. So suppose T is composed of sentence S1 and S2. Then ‘x believes that *T’* ascribes to x, the belief that S1 and S2. If that belief ascription is true, then we can truly ascribe to x, the belief that T. Notably, even if T and T\* are metaphysically equivalent theories, it seems clear that we can make the following true belief ascriptions to Jack: ‘Jack believes that *T’*, whilst also making the following *false* belief ascription to Jack ‘Jack believes that *T\*’*.

Now, defining metaphysical equivalence, on the one hand, and explaining how it is that Jack can bear different propositional attitudes towards metaphysically equivalent theories, on the other hand, are two entirely different projects. So it is no part of a desideratum for a theory of metaphysical equivalence that that account *itself* affords us the resources to accommodate the hyperintensional nature of the psychological attitudes. There is no reason an account of metaphysical equivalence ought say anything at all about how we should understand the hyperintensional nature of the psychological attitudes. Notice, though, that what D3 says is that whatever our account of metaphysical equivalence, it needs to be *consistent* with us *being able to* accommodate the fact that individuals can bear different psychological attitudes towards metaphysically equivalent theories. That is, such an account had better not be such that it rules out our being able to model the hyperintensional nature of the psychological attitudes. D3 becomes especially salient given that the account of metaphysical equivalence I shall offer in Section 3 is one that, *prima facie,* looks as though it might remove (or, perhaps better, *use up*) all of the resources to which theories usually appeal in modelling the hyperintensional nature of the psychological attitudes. That is why, in Section 3, I go to some pains to show that defining metaphysical equivalence in terms of strong hyperintensional equivalence does not, despite appearances, flout D3. For if the account did, in fact, render it impossible (or even extremely difficult) to account for the hyperintensional nature of our psychological attitudes, that would be reason enough to reject it.

 I will not argue further for D1—D3 here. I will simply assume, going forth, that any plausible account of metaphysical equivalence should meet D1—D3.

 If one accepts D1—D3, then it follows that meanings cannot be exhausted by intensions: something more fine-grained is required. The implicit suggestion in what I have said so far is that we should give up on being intensionalists, and instead switch to being hyperintensionalists, and, in so doing, we should define metaphysical equivalence in terms of hyperintensions. It is to that task that I now turn.

3. Defining Metaphysical Equivalence in terms of Hyperintensions

Once we take seriously the idea that we ought to define metaphysical equivalence in terms of something like hyperintensional equivalence, we immediately see that D1—D3 are in tension. D1 and D2 require that we be able to capture some sense of *sameness* of meaning or content between metaphysically equivalent but necessarily true (or false) theories, a sameness that does not obtain between metaphysically inequivalent but necessarily true (or false) theories. D3, by contrast, requires that we be able to capture some *difference* in meaning or content between metaphysically equivalent theories, such that we can explain how it is that an individual can bear different attitudes towards theories that are metaphysically equivalent. Hence these three desiderata pull in different directions: the former pair pull in favour of fine-graining meaning in terms of hyperintensions, in such a way that metaphysically equivalent theories come out as sharing the *same* hyperintension; the latter pull against such a proposal, insofar as we want to hyperintensionally *distinguish* any contents towards which an individual can direct different propositional attitudes.

 This tension suggests that defining metaphysical equivalence in terms of hyperintensional equivalence will be problematic. For suppose we say that two theories, T and T\*, are metaphysically equivalent iff they are hyperintensionally equivalent. Then if T and T\* are hyperintensionally equivalent, it is difficult to see how to meet D3: for there is not even a *hyperintensional* difference between T and T\* to which we can appeal in order to model Jack’s bearing one psychological attitude towards T, and a different attitude towards T\*. Or, to put it around the other way, if we think that the right way to model Jack’s being able to bear different psychological attitudes towards T than towards T\*, is to say that T and T\* are hyperintensionally distinct, then it follows that T and T\* are not metaphysically equivalent. So either no theories will turn out to be metaphysically equivalent, for none will be hyperintensionally equivalent, or, alternatively, some theories will turn out to be metaphysically equivalent but it will then be impossible to model the hyperintensional nature of the psychological attitudes that non-ideal agents can have towards said theories by appealing to hyperintensional differences between the theories. That, in turn, would seem to make it very difficult to meet D3.

 This is why I will shortly suggest that we ought to define metaphysical equivalence not in terms of hyperintensional equivalence, but in terms of *strong* *hyperintensional equivalence*. I will then suggest that we can appeal to what I call *weak hyperintensional distinctness* in order to accommodate the hyperintensional nature of the psychological attitudes and thus meet D3.

 Here is the idea. There are ways things are, and ways things could be (but aren’t), and ways things could not be. Desiderata D1 and D2 push us towards hyperintensionally distinguishing only those intensionally equivalent metaphysical theories that are genuinely inequivalent. In some good sense we want to say that the metaphysically equivalent theories are those that are *not really distinct.* Those that are metaphysically inequivalent, however, *really are distinct.* To capture this, I introduce the notion of a strong hyperintension. Strong hyperintensional distinctions are those that allow us to distinguish all and only the *genuinely* *distinct* ways things could, and could not, be. Strong hyperintensional distinctions are those that even God needs in order to express all of truths. We can then define metaphysical equivalence in terms of sameness of strong hyperintension.

ME: Metaphysical theories M and M\* are metaphysically equivalent iff M and M\* are strongly hyperintensionally equivalent.

ME seems to capture what we want. If M and M\* are strongly hyperintensionally equivalent, then it is natural to say that they do not genuinely differ in their meaning or content. Put it this way: for any two genuinely distinct ways things could, and could not be, if M and M\* are metaphysically equivalent then they will take the same truth-values across all the genuinely distinct ways things could, or could not, be. By contrast, if M and M\* are intensionally equivalent, but metaphysically inequivalent, then there are at least some genuinely distinct ways things could not be, such that M and M\* take different truth-values at those genuinely distinct ways things could not be. Intuitively, this seems like the right result. If nihilism and presentism are both, say, necessarily true, then they are intensionally equivalent. But on the plausible assumption that they are not metaphysically equivalent there will be some way things cannot be, in which presentism is true and nihilism is false, and some way things cannot be, in which presentism is false and nihilism is true. Indeed, understanding that there are such ways things could not be seems to be partly constitutive of understanding each of these theories, and of understanding that they are not metaphysically equivalent.

But just as not every thought we can entertain, and not every set of sentences we can utter, corresponds to a way things could be, so too not every thought we can entertain, and not every set of sentences we can utter, corresponds to a way things *could not be.* Indeed, D3 pushes us to recognise distinctions that appear not to be genuine, but rather, to be the result of our non-ideal representational systems. The fact that we can truly ascribe to Jack the belief that T, but we cannot truly ascribe to Jack the belief that T\*, despite T and T\* being metaphysically equivalent, seems to be due entirely to Jack’s ignorance. To capture this we need to introduce weak hyperintensions. By contrast to strong hyperintensional distinctions, *merely weak hyperintensional* distinctions are those we draw solely as a result of ignorance or a failure of rationality. These distinctions are due entirely to features of our representational system.

Having defined metaphysical equivalence in terms of strong hyperintensional equivalence, if we can distinguish strong from weak hyperintensions we can make sure that our definition of metaphysical equivalence in terms of strong hyperintensions does not make it impossible, or even excessively difficult, to meet D3. It is to this that I now turn.

3.1 Modelling Strong and Weak Hyperintensions.

In what follows I propose a way of modelling the distinction between strong and weak hyperintensions. I won’t try to argue that this is the *only* way to do so. For my purposes, all that really matters is that we *can* distinguish these two hyperintensions: if a standard “all in one” account of hyperintensionality is able to draw some principle distinction between strong and weak hyperintensions using only the posits of its theory, then that is all to the good. As it happens I am not so sanguine about these prospects, which is why, as we will see, I offer the account I do.

I define strong hyperintensions as follows:

Strong Hyperintension*=df:* a function from possible and impossible worlds to extensions.[[12]](#footnote-12)

Then the strong hyperintension of a name is the individual the name picks out at each possible and impossible world, the strong hyperintension of a predicate is the property it picks out at each possible and impossible world, and the strong hyperintension of a sentence is its truth-value at every possible and impossible world. Or, to put it another way, the strong hyperintension of a sentence is the set of possible and impossible worlds at which the sentence is true.

Arguably, this is not the only way to model strong hyperintensions. Another general approach to hyperintensionality models that phenomenon in terms of structured propositions. According to that view, hyperintensions are structured entities—entities structured in such a way that their structure in some way reflects the structure of the relevant expression.[[13]](#footnote-13) Structured propositions are, then, structured arrangements of objects, properties, and relations. According to the simplest version of that view, a hyperintension of a name is its referent; the hyperintension of a predicate is a property, and the hyperintension of a sentence is some structured arrangement of simpler hyperintensions. Sentences express a different structured proposition if either the structure, or what is in the structure, differs.

One could, then, *identify* structured propositions with strong hyperintensions, and then model weak hyperintensions in some other manner (such as the manner I will shortly suggest). This will work just as well as appealing to impossible worlds to model strong hyperintensions, as long as we can get the approach to countenance just the right structured propositions. For, recall, strong hyperintensions are supposed to be those that track *only* genuine distinctions. That means that not just any account of structured propositions will do. So, for instance, we will need an account that can associate, with empty names or empty predicates, some hyperintension. Consider the necessarily false sentence ‘2+2=5’. Although that sentence is necessarily false, each name in the sentence refers. So there is a structured proposition that contains those elements, in the relevant order, which expresses that necessary falsehood. But now, consider some necessarily false sentence that contains empty names or predicates. Consider the sentence ‘Pegasus is hween’. Let us suppose that ‘hween’ names a necessarily non-existent property, and ‘Pegasus’ names a necessarily non-existent individual. Then the sentence is necessarily false. It had better not be that there is no hyperintension associated with ‘Pegasus’ or with ‘hween’, and thus that there are no elements that can ‘go into’ a structured proposition, else the hyperintension of that sentence will be empty. Yet one can expect some necessarily false, but metaphysically inequivalent, metaphysical theories to include sentences that have positions filled with names or predicates that are empty—namely those that are composed of sentences with names for impossible individuals, or predicates that name impossible properties. If so, any account of structured propositions will need to be one that permits such sentences to have non-empty hyperintensions. Otherwise all sentences of this kind will come out as strongly hyperintensionally equivalent, and hence, on my account, as metaphysically equivalent. Arguably, the defender of structured propositions does have a way around the problem of empty names. For instance she might appeal to Salmon-style guises/modes of presentation (Salon 1983) or to Richard-style enriched propositions (Richard 1990; Chalmers 2011b). If so, it looks as though she will have *enough* strong hyperintensions to do the job at hand.

It is worth noting, however, that if the aim is to identify strong hyperintensions with structured propositions, then there had better not be *too many* structured propositions. For we want all and only the strong hyperintensions needed to make all the genuine distinctions that there are. I earlier noted that some proponents of structured propositions take the hyperintension of a name to be its referent. More recently, however, defenders of structured propositions have not taken this route. In order to accommodate the hyperintensional nature of the attitudes, they have instead supposed that the very same name can have associated with it different modes of presentation which, in turn, are associated with different structured propositions. It is this which allows such views to hyperintensionally distinguish “Superman runs fast” from “Clark Kent runs fast”, where this is taken to be desirable because, for instance, Lois Lane bears one psychological attitude to the former, which she does not bear to the latter (namely belief). But if the aim is to identity strong hyperintensions with structured propositions, then we precisely do not want “Superman runs fast” and “Clark Kent runs fast” to be associated with different structured propositions, and hence different strong hyperintensions.

After all, suppose there is some theory T1, composed of sentences S1….Sn, such that some of S1….Sn have positions filled by “Superman”. Now construct a theory, T2, which takes all of the sentences that compose T1, and for each sentence either adds that sentence to T2 as it stands or, if the sentence has a position in it that is filled with the name “Superman” it replaces the occurrence of that name, in that position, with the name “Clark Kent”. If the strong hyperintension of a *theory* is some combination of the strong hyperintensions of all of the sentences that compose that theory, then T1 and T2 will not share the same strong hyperintension. But we do not want to say that the strong hyperintension of T1 is distinct from the strong hyperintension of T2 and hence that the two theories are metaphysically *inequivalent*. For surely if any two theories are metaphysically equivalent, these are. That means that if we are to identity strong hyperintensions with structured propositions, the strong hyperintension of names must be their referents. So if we want to identity strong hyperintensions with structured propositions we will need some other account of weak hyperintensions that does not appeal to structured propositions, an account that will allow us to model, *inter alia*, Lois Lane’s beliefs. Alternatively, we could try to delineate some sub-class of structured propositions as the strong hyperintensions, and some other sub-class as the weak hyperintensions, by drawing some principled distinction between structured propositions. I do not, however, know how to go about this, and I leave it to the defender of structured propositions to attempt to do so should she so desire. In the meantime, my preferred way of modelling strong hyperintensions is, recall, the following:

Strong Hyperintension*=df:* a function from possible and impossible worlds to extensions

We can now define the notion of strong hyperintensional equivalence and distinctness, as follows:

Strong Hyperintensional Distinctness: Sentences s and s\* are strongly hyperintensionally distinct iff the set of possible and impossible worlds that is the extension of s, is distinct from the set of possible and impossible worlds that is the extension of s\*.

Strong Hyperintensional Equivalence: Sentences s and s\* are strongly hyperintensionally equivalent iff the set of possible and impossible worlds that is the extension of s, is identical to the set of possible and impossible worlds that is the extension of s\*.

Notice, however, that ME will be plausible only if we countenance the existence of only those impossible worlds that represent *genuinely distinct* ways things *could not be*. Here is the thought. Impossible worlds are each a certain way. Whichever way an impossible world, *w*, is, it is a way that, if theory T and T\* are metaphysically equivalent, then both T and T\* take the same truth-value at *w*. That is because what it is for T and T\* to be metaphysically equivalent is for any way things genuinely can be, or any way things *genuinely* *cannot be*, to be the same with respect to T as they are to T\*. By contrast, for any two metaphysically inequivalent theories, T’ and T’’ there will be some impossible world, *w*\*, such that T’ takes a different truth-value at *w*\* than does T’’.

In what follows I assume that both possible and impossible worlds are ersatz worlds.[[14]](#footnote-14) On the one hand, then, my account requires that there are *enough* impossible worlds to represent all of the genuinely distinct ways things could not be. This means that some approaches to modelling impossible worlds are ruled out. Conservative accounts that attempt to build impossible worlds out of possible worlds will unduly constrain the sphere of impossible worlds. According to such views, impossible worlds are inconsistent sets of possible worlds. Plausibly, however, some necessarily false sentences will be ones whose hyperintension cannot be modelled by some inconsistent combination of contingent truths that hold at different possible worlds.[[15]](#footnote-15) For instance, necessarily false sentences that involve reference to impossible individuals cannot be modelled by inconsistent combinations of contingent truths and, depending on the extent of the sphere of possible worlds, it may not even be possible to model all sentences that involve reference to impossible properties by inconsistent combinations of possible worlds. Thus my account of metaphysical equivalence requires a more liberal approach to the construction of impossible worlds.

 According to the *most* liberal accounts, the impossible-world-making language is at least as rich as ordinary language. That is, if there is an English sentence A and an English sentence B then there is some world-making sentence or sentences that corresponds to A (that is, which translates A in to a world-making sentence A\*) and some different world-making sentence or sentences that corresponds to B (which translates B into a world-making sentence B\*). Then there is an impossible world (w1) that includes the sentences A\* and B\*, and an impossible world (w2) that includes sentence A\*, and includes the negation of B\*, and there is an impossible world (w3) that includes B\* and the negation of A\*. Let ‘A’ stand as a placeholder for all of the sentences that jointly compose metaphysical theory T, and let ‘B’ stand as a placeholder for all of the sentences that jointly compose metaphysical theory T\*. Then on the assumption that the set of sentences that composes T, is distinct from the set of sentences that composes T\* (as surely it must be) then on such an account there is an impossible world at which T and T\* take different truth-values. So this most liberal account of impossible worlds is too liberal. It countenances too many impossible worlds. For T and T\* will turn out to have distinct strong hyperintensions so long as each is composed of different English sentences, and that will be so even if T and T\* are, in fact, metaphysically equivalent. Indeed, on such a view no two theories will share a strong hyperintension, and so no theories will count as metaphysically equivalent.

So my approach to modelling metaphysical equivalence requires a view about the sphere of impossible worlds that falls somewhere in between the conservative view, that is too conservative, and the most liberal view, that is too liberal. That view, I will argue, is what I call the Lagadonian approach. According to such an approach, impossible worlds are sets of sentences (maximal or non-maximal) in a Lagadonian language—a language in which individuals are their own names, and properties are their own predicates—closed under logical consequence in some non-classical logic. To build words in this way we first need to suppose that there actually exists every possible property, it is just that the merely possible properties are uninstantiated. Or, alternatively, we could suppose that there actually exist *instantiated* negative properties. So consider some merely possible property of F-ness. We can either say that F-ness actually exists, but is uninstantiated, or we can say that although F-ness does not actually exist, a negative property, non-F-ness does actually exist. In the latter case we can then use the property of non-non-F-ness to represent F-ness.[[16]](#footnote-16) We will then say that each of these properties is their own name. We then have a Lagadonian language that includes names for all possible properties. Now we need names for all possible individuals. Actual individuals are their own names. Merely possible individuals are represented by bundles of possible properties. Each such bundle is its own name. Thus for any consistent way of bundling up properties, there is a possible individual that corresponds to that bundle, and that individual is its own name. Impossible properties can then be represented by inconsistent sets of possible properties. Each such set is the name of some impossible property in the Lagadonian language. Finally, impossible individuals can be represented by bundles of both possible and impossible properties. That is, *every* bundle of possible and impossible properties is the name of an impossible individual. Of course, if one thinks that it is possible that distinct individuals permute *all* of their properties, then one will need to have a single pluriverse in which all of these worlds reside, in order to avoid conflating distinct possibilities (and impossibilities) in which purportedly distinct individuals permute all their properties.[[17]](#footnote-17)

Which sets of Lagadonian sentences compose impossible worlds? For any set of Lagadonian sentences (maximal or non-maximal) there is an impossible world composed of those sentences, closed under logical consequence (in some non-classical logic). This last requirement means that the truth conditions for conjunction, disjunction and the quantifiers remains the same in impossible worlds as in possible worlds.[[18]](#footnote-18) That, in turn, means that these impossible worlds are closed under conjunction. So if sentences S1 and S2 are each true in impossible world *w*, then it follows that the conjunction of S1 and S2 is true in *w*. Since theories are, on my view, sets of sentences, the strong hyperintension of a set of sentences, S, will be the set of possible and impossible worlds at which the conjunction of all of the sentences in that set, is true. For any theory, T, call the conjunction of the sentences that compose T, TC. Then:

The strong hyperintension of a *theory*, T, is the set of possible and impossible worlds at which TC is true.

Further, we can now define strong hyperintensional equivalence for theories, as follows:

Theories T and T\* are strongly hyperintensionally equivalent iff there exists a set, S, of possible and impossible worlds at which TC is true, and there exists a set S\* of possible and impossible worlds at which T\*C is true, and S = S\*.

We now have the resources with which to determine whether two metaphysical theories, T and T\*, are metaphysically equivalent.

The motivation behind modelling impossible worlds in this way is as follows. If impossible worlds are sets of sentences in a Lagadonian language, then the way a world is, with respect to the distribution of individuals, properties, and relations—as specified by the Lagadonian sentences that compose the world—fixes all the truths about that world. If theory T is necessarily false, then there is an impossible world, *w,* at which T is true: a world in which some impossible properties and individuals are distributed in such a way as to make true the sentences that jointly compose T. If T\* is metaphysically equivalent to T, then *whichever* way *w* is, is also a way that will render the set of sentences that jointly compose T\*, true at *w*. *Whatever* *w* represents, what is represents will be such that T and T\* take the same truth-value at *w:* true, false, both true and false, or neither true nor false.

 Building worlds from Lagadonian sentences guarantees that impossible worlds represent all and only the genuinely distinct ways things could not be. That is because by building worlds from sets of sentences in which individuals and properties are their own names, we guarantee that we do not accidentally represent, as distinct, two ways things could not be, where these ways are in fact not distinct. That is a risk we run if we build worlds from sets of non-Lagadonian sentences. For in that case we will suppose *w* and *w*\* to be distinct worlds if they are composed of different sentences; leaving open the possibility that in fact the two sets of sentences mean the same thing, and thus that *w* and *w*\* are not, in fact, distinct impossible worlds at all.

 The sphere of impossible world countenanced by this approach is such that the theories we intuitively suppose to be metaphysically equivalent will take the same truth-values at all worlds, and thus will be strongly hyperintensionally equivalent. Moreover, theories that are strongly hyperintensionally equivalent are pretty plausible candidates to be metaphysically equivalent. These are theories whose truth-values do not come apart in *any* world. It is hard to see what sort of theories could meet such a condition, but fail to be metaphysically equivalent.

If so, we have an account of metaphysical equivalence that meets D1 and D2. For we are able to distinguish necessarily true metaphysical theories that are equivalent, from those that are inequivalent, and we are able to distinguish necessarily false metaphysical theories that are equivalent, from those that are inequivalent. The question remains whether we are able to meet D3. D3 demands that our account of metaphysical equivalence not be one that rules out accounting for the hyperintensional nature of the psychological attitudes. That danger is very real.

For if we endorse the account of impossible worlds I just outlined, then for any two metaphysically equivalent theories T and T\*, we cannot account for the hyperintensional nature of psychological attitudes towards T and T\* by pointing out that there is some impossible world in which T and T\* take different truth-values: for there are no such impossible worlds. If the only way to get sufficiently fine-grained contents towards which we can direct our psychological attitudes is by appealing to impossible worlds, then my account of metaphysical equivalence will make it impossible to meet D3. Equally, if we instead modelled strong hyperintensions in terms of structured propositions, identifying the former with the latter, then, for the same reasons, we will be unable to appeal to structured propositions to account for the hyperintensional nature of the psychological attitudes. One option, which I shall not explore here, would be to identify strong hyperintensions with impossible worlds, and then appeal to structured propositions (alongside modes of presentation) to model the hyperintensional nature of the attitudes: that is, to model what I call weak hyperintensions. This does not strike me as a very elegant solution (if it can be made to work) but I will not argue for this claim here. I, however, will not model weak hyperintensions in that manner. Instead, I will suggest that we ought to take weak hyperintensions to be functions from possible worlds, impossible worlds, and *fabulae*, [[19]](#footnote-19) to extensions.

Weak Hyperintension=df: a function from possible worlds, impossible worlds, and fabulae, to extensions.

What, are *fabulae*? Let us briefly turn to a different proposal for modelling some aspects of hyperintensionality, from which I will go on to develop an account of fabulae.

Proponents of two-dimensional semantics hold that sentences are associated with two different intensions, and that which intension a sentence expresses, depends on what the actual world is like. [[20]](#footnote-20) The second intension, (known as the A-intension) is a function from worlds to intensions. Expressions with the same *intension* can nevertheless have a different *A-intension*. For example ‘water’ and ‘H2O’ have the same intension but a different A-intension since had it been the case that actually, water is XYZ, the function from the world in which water is XYZ, to intensions, would generate an intension according to which water and H2O have different intensions. What motivates appealing to A-intensions is the intuition that *which* intensions our sentences express, depends on how things actually are, and, further, that we might now *know* how things actually are. The A-intension is effectively a function from the different possible ways we *think* the actual world might be, to intensions.

Bearing that in mind, however, we can now notice that not only can we fail to know, of the possible ways things are, which are actual, but we can fail to know, of the possible and impossible ways things are, which are possible and which actual. Some of those who embrace something like this two-dimensional picture have gone on to suppose that there is also a *third* intension which captures this kind of ignorance. One could do so by positing impossible worlds and suggesting that the third intension is a function from possible and impossible worlds, to A-intensions. But some advocates of such a view prefer to say that they are functions from what non-ideal agents are disposed to say and do if they come to *believe* that some *impossibility* obtains, to A-intensions. [[21]](#footnote-21) Such an approach appeals to a functional role account of meaning. Functional role semantics holds that the meanings of expressions are given by their functional role: the kinds of communicative, linguistic, mental and other behaviours that are liable to cause their tokening and the kinds of communicative, linguistic, mental and other behaviours their tokening is disposed to cause. A-intensions are, effectively, individuated in terms of what functional role an expression would have, conditional on some possible world being actual. 3-intensions, by contrast, individuate expressions in terms of the functional role of expressions *were we to come to believe that certain (as it turns out impossible) discoveries are actual*.

 We can use this insight to develop fabulae. These are, roughly speaking, representations of how a non-ideal agent would take things actually to be, were he or she to come to believe some impossibility to be actual. More specifically, I suggest that fabulae are composed of the (maximal or non-maximal) sets of sentences to which a non-ideal would be disposed to assent, conditional on taking some impossibility to actually obtain. So, for instance, suppose I came to believe that the four-colour theorem is false.[[22]](#footnote-22) The omniscient being would not come to believe any such thing. The ideally rational being would, after due consideration, come to reject the belief that the four-colour theorem is false. I, however, would be disposed to go and buy extra paint were I to be in the map-making business. By contrast, if I came to believe that 2+2=5 I would not be disposed to go out and buy more paint were I to be making maps, or otherwise. Instead, I would be inclined to go about saying that 2+3=6, and if I had two sets of 2 friends and had to divide a cake equally amongst them, I would be disposed to cut the cake into 5 pieces, and so on. For any impossibility that a non-ideal agent can take actually to obtain, there is a fabula that represents what that the agent would be disposed to take to be true, given that that impossibility obtains: namely the fabula containing all of the sentences the agent would be disposed to assent to, conditional on coming to believe that said impossibility obtains.

 Return to consider Jack, who does not believe that T and T\* (both of which are necessarily true) are metaphysically equivalent, though they are. What Jack would be disposed to say and do, were he to come to believe that T is false, is quite different from what he would be disposed to say and do were he to come to believe that T\* is false. For instance, Jack is not disposed to say that T is false, conditional on coming to believe that T\* is (*per impossible*) false; nor is Jack disposed to say that T\* is false, conditional on coming to believe that (*per impossible*) T is false. So there is a fabula at which T and T\* take a different truth-value. Or, as we might say, T and T\* have different weak hyperintensions. We can define weak hyperintensional distinctness as follows:

Weak Hyperintensional Distinctness: sentences s and s\* are weakly hyperintensional distinct iff the set of possible worlds, impossible worlds, and fabulae, in the extension of s, is distinct from the set of possible worlds, impossible worlds, and fabulae, in the extension of s\*.

We can now see that any two sentences, s and s\*, that are *intensionally distinct* are thereby both *strongly hyperintensionally distinct* and *weakly hyperintensionally distinct*, though there are some sentences that are strongly hyperintensionally distinct but are intensionally equivalent Likewise, for any two sentences, s and s\*, that are *either intensionally distinct* *or strongly hyperintensionally distinct*, those sentences are *weakly hyperintensionally distinct*. But there will be some sentences that are both intensionally equivalent and strongly hyperintensionally equivalent but which are weakly hyperintensionally distinct. In particular, if s and s\* are strongly hyperintensionally equivalent, but weakly hyperintensionally distinct, then we might say that they are *merely* weakly hyperintensionally distinct. So, for instance, if T and T\* are metaphysically equivalent, then they are strongly hyperintensionally equivalent. So if T and T\* are weakly hyperintensionally distinct, then they are *merely* weakly hyperintensionally distinct. Their distinctness lies in the fact that although there is a fabula at which they take different truth-values, there is no possible or impossible world at which they take different truth-values. We can define mere weak hyperintensional distinctness as follows:

Mere Weak Hyperintensional Distinctness: sentences s and s\* are merely weakly hyperintensionally distinct iff s and s\* are strongly hyperintensional equivalent—s and s\* have the same extension at every possible and impossible world—but there is some fabula, F, at which s and s\* do not take the same truth-value.

We can then define the weak hyperintension of a *theory*, as follows. Again, for any theory, T, call the conjunction of the sentences that compose T, TC. Then:

The weak hyperintension of a *theory*, T, is the set of possible world, impossible worlds, and fabulae, at which TC is true.

Further, we can define mere weak hyperintensional distinctness for theories, as follows:

Theories T and T\* are merely weakly hyperintensionally distinct iff T and T\* are strongly hyperintensionally equivalent, and there is a set, S, of fabulae at which TC is true, and a set S\*, of fabulae at which T\*C is true, and S ≠ S\*.

Appealing to mere weak hyperintensional distinctness affords us exactly the resources we want in order to meet D3, while appealing to strong hyperintensional equivalence allows us to meet D1 and D2. We can model the fact that Jack can take different psychological attitudes towards T and T\*, by noting that he can do so because T and T\* are weakly hyperintensionally distinct. But, we can note, T and T\* are *merely* weakly hyperintensionally distinct: there is no genuine distinction to be made between them: they are strongly hyperintensionally equivalent. There is no world, possible or not, in which T is true and T\* is false: there is merely a fabula which represents what non-ideal agents would be disposed to say and do, were they to come to believe that T (or T\*) is false.

 At this point one might wonder if weak hyperintensional distinctions will always be agent relative. Jack is disposed to behave differently on coming to believe that T is false, than on coming to believe that T\* is false, and in part that is because Jack does not believe T and T\* to be metaphysically equivalent. But now consider John, who does believe T and T\* to be metaphysically equivalent. Plausibly, what John is disposed to say and do upon coming to believe that T is false, is the very same thing that he is disposed to say and do upon coming to believe that T\* is false. John is certainly not disposed to continue to suppose T to be true, upon coming to believe that T\* is false. So, we might worry that relative to John, there is no fabula at which T and T\* take different truth-values, and hence we might worry that whether two sentences, s and s\*, or two theories, T and T\*, are weakly hyperintensionally distinct can only be determined relative to the particular features of an individuals’ representational scheme. If so, then we cannot talk about whether T and T\* are weakly hyperintensionally distinct, *simpliciter*, but only whether they are weakly hyperintensionally distinct relative to Jack, or relative to John.

 If that were so, it is not clear that that would be any bad thing: after all, *mere* weak hyperintensional differences really are only tracking non-genuine distinctions made by non-ideal agents. If some non-ideal agents do not represent said distinctions then, for those agents, those sentences are not even weakly hyperintensionally distinct. Nevertheless, I do not think that we need go this route. Although John believes T and T\* to be metaphysically equivalent, he can, presumably, ask himself what he would be disposed to say and do were he to come to believe *both* that T and T\* are not equivalent, and that T is true. After all, just as we cannot be certain that we are right about which worlds are possible, or right about which worlds are impossible, and hence we can consider what we would say if we came to believe that something we current suppose to be impossible, were actual, so too we cannot be certain that we are right about which theories are equivalent, and we can ask ourselves what we would be disposed to say and do were we to come to believe that they are not equivalent. Thus for any non-ideal agent whatsoever, the same sentences will come out as weakly hyperintensionally distinct: for non-ideal agents can always ask themselves what they would be disposed to say and do, were their beliefs to change in various ways. The difference between John and Jack, then, does not lie in the fact that for John, T and T\* are weakly hyperintensionally equivalent while for Jack they are not. Rather, it lies in the fact that John *believes*, while Jack does not, that T and T\* are strongly hyperintensionally equivalent.[[23]](#footnote-23)

 Finally it is worth noting that although I defined strong hyperintensions in terms of (*inter alia)* impossible worlds, and weak hyperintensions in terms of (*inter alia*) fabulae, one could choose to unify both kinds of hyperintension by arguing that possible worlds, impossible worlds, and fabulae, are all just *worlds*. Indeed, one might re-label fabulae as mere representational worlds or some such, to distinguish them from either possible or impossible worlds. Then, intensions, strong hyperintensions and weak hyperintensions are all functions from worlds to extensions: what distinguishes them is whether the function takes them only to possible worlds (intensions) possible and impossible worlds (strong hyperintensions) or possible worlds, impossible worlds, and fabulae (weak hyperintensions). Notably, it must be kept in mind that while both possible and impossible worlds will be composed of sentences in a Lagadonian language, fabulae, or mere representational worlds, will not. Nevertheless, calling them all *worlds* seems to me to be a mere terminological variation on the account I have presented, and a harmless one at that, as long as we remember in what the differences consist.

5. Conclusion

ME is a plausible definition of metaphysical equivalence: it meets desiderata D1 and D2, and in so doing adequately captures our intuitions about the phenomenon of metaphysical equivalence. Moreover, despite defining strong hyperintensions in terms of impossible worlds, we are still afforded the resources to model weak hyperintensions, and thus to accommodate D3. Moreover, the distinction between strong and weak hyperintensions is, I think, an independently useful one for our toolkit.

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1. The view that objects persist by one and the same object occupying a series of three-dimensional regions of space. [↑](#footnote-ref-1)
2. The view that objects persist by occupying a four-dimensional region of space-time and thus only partially occupying each three-dimensional region of space within that region. [↑](#footnote-ref-2)
3. The view that there are no composite objects. [↑](#footnote-ref-3)
4. The view that for any set of objects, there is some composite objects those objects compose. [↑](#footnote-ref-4)
5. Anyone who embraces Humean supervenience will reject such a possibility. [↑](#footnote-ref-5)
6. See Hirsch (2002, 2005, 2009) and Miller (2005b) [↑](#footnote-ref-6)
7. See Nolan (2013), Jago (2014), Mares (1997) and Yagisawa (2010). [↑](#footnote-ref-7)
8. See Ripley (2012), and King (1996, 1997, 2007). [↑](#footnote-ref-8)
9. The view that past, present, and future objects, properties, and events exist, [↑](#footnote-ref-9)
10. The view that only present objects, properties, and events exist. [↑](#footnote-ref-10)
11. Intensionalists hold that there are no positions in sentences of our language that are hyperintensional. Intensionalists will reject D1. [↑](#footnote-ref-11)
12. The approach to modelling hyperintensionality in terms of impossible worlds is sometimes known as a circumstantialist approach (see Ripley 2012 for a defence of the view under that name). Adherents include Nolan (1997), Restall (1997), Ripley (2012) Goddard and Routley (1973), Jago (2014), Priest (2005), Barwise and Perry (1999). [↑](#footnote-ref-12)
13. See Soames (1987), Cresswell, (1985) and King (1995; 1996; 2007). [↑](#footnote-ref-13)
14. Though see Yagisawa (2010) for a defence of the view that impossible worlds are concrete. [↑](#footnote-ref-14)
15. See Rescher and Brandom, (1979) [↑](#footnote-ref-15)
16. See Jago (2014) for discussion of this approach. [↑](#footnote-ref-16)
17. See Sider (2002) for more on this. [↑](#footnote-ref-17)
18. See Restall (1997) Mares (1997); Goble (2006), and Priest (2005) for discussion of impossible worlds closed under the logical consequence of some non-classical logic. [↑](#footnote-ref-18)
19. I use “fabula” and the plural “fabulae” (Latin for narrative) to distinguish what I have in mind from situations, as posited by Barwise and Perry (1983) circumstances, as posited by Ripley (2012), or scenarios, as posited by Chalmers (2011). [↑](#footnote-ref-19)
20. Primary and secondary, according to Chalmers (2004) or A-intensions and C-intensions according to Jackson (2004). [↑](#footnote-ref-20)
21. Braddon-Mitchell (forthcoming) defends such a view. [↑](#footnote-ref-21)
22. The four-colour theorem says that given any separation of a plane into contiguous regions, one needs no more than four colours in order to colour the regions so that no two adjacent regions are the same colour. [↑](#footnote-ref-22)
23. Notice that we can make sentence of sentences like S, below by appealing to weak hyperintensions.

S: One ways things could not be, is for there to be impossible worlds w1…wn which are *not* countenanced in the Lagadonian account of impossible worlds.

Although S’s strong hyperintension is the empty set, it takes a truth-value at some fabulae and therefore has a non-empty weak hyperintension. [↑](#footnote-ref-23)