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Williamson on necessitism

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ABSTRACT
I critically discuss some of the main arguments of *Modal Logic as Metaphysics*, present a different way of thinking about the issues raised by those arguments, and briefly discuss some broader issues about the role of higher-order logic in metaphysics.

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This paper is a study of some of the main arguments of *Modal Logic as Metaphysics* (hereafter *MLaM*).[1] In Section 1, I will discuss Williamson's argument in Chapter 6.2 that contingentists should be higher-order contingentists. In Section 2, I will consider Williamson's argument for necessitism in Chapter 7. In Section 3, I will present a different way of thinking about the issues raised by that argument. In Section 4, I will consider some broader issues about the role of higher-order logic in metaphysics.

It would be hard to overstate the influence of *MLaM* on my own philosophical development, as a source of both ideas and inspiration. Although my discussion will mostly be critical, it takes place against a backdrop of broadly shared methodological assumptions and priorities. I hope it conveys some sense of the richness and subtlety of the underlying philosophical issues, and of Williamson's contribution to our understanding of them.

1. From contingentism to higher-order contingentism

In Chapter 6.2 of *MLaM*, Williamson argues that contingentists – those who think that $\neg\Box\forall x\Box\exists y(y = x)$ – should be higher-order contingentists. In particular, they should think that it is a contingent matter which properties there are: $\neg\Box\forall F\Box\exists G(F \approx G)$, where $\approx$ abbreviates some higher-order analogue of the identity predicate, taking monadic predicate variables rather than individual

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variables as arguments. (Following Williamson, I will use 'property'-talk to pronounce in English claims that are properly formalized using quantification into monadic predicate positions.) There are a number of options for how to interpret $\approx$: these include necessary co-extensiveness ($\Box\forall x(Fx \leftrightarrow Gx)$), necessary co-intensiveness ($\Box\forall x\Box(Fx \leftrightarrow Gx)$), higher-order indiscernibility ($\forall O(OF \leftrightarrow OG)$), and taking the notion as primitive (i.e. taking as axiomatic that it is reflexive and obeys some appropriate version of Leibniz's law). Williamson discusses these issues in Chapter 6.1, and I will return to them later. For now, I will follow Williamson and treat $\approx$ as shorthand for talk of necessary co-extensiveness, and hence treat the claim that it is a contingent matter which properties there are as shorthand for $\neg\Box\forall F\Box\exists G\Box\forall x(Fx \leftrightarrow Gx)$. In this section I want to raise some questions about Williamson's reasons for thinking that contingentists should accept this further claim.

1.1. Symmetry

With respect to the combination of contingentism and higher-order necessitism, Williamson writes that 'The onus is on the metaphysician who postulates such logical differences between orders to justify the asymmetry in treatment' and that 'The default preference is for a uniform metaphysics, on which being is contingent at all orders or none' (274). Is this true?

It often happens in theorizing about inductively defined classes (like the natural numbers) that base cases of the induction (e.g. 0) fail to satisfy important generalizations that are satisfied by the remaining members of the class. Of particular interest here is the hierarchy of syntactic types of expressions of $\mathrm{ML_P}$, the higher-order formal language in which Williamson formulates competing theories of modal metaphysics. As he explains in Chapter 5.5, types are defined inductively as follows: e (the type of individual variables) is the only basic type, every finite sequence of types is a type, and nothing else is a type. Intuitively, an expression of type $\langle t_1, \ldots, t_n\rangle$ is a predicate that takes n arguments, respectively of types $t_1 \ldots, t_n$, in that order. (In this broad sense of 'predicate' formulas are 0-place predicates of type $\langle\rangle$, dyadic sentential operators like 'and' are 2-place predicates of type $\langle\langle\rangle, \langle\rangle\rangle$, etc. We sometimes indicate the type of an expression with a superscript on its first occurrence in a formula.) For every type of expression, there is a corresponding necessitist thesis: in the case of type e, it is $\Box\forall x^e\Box\exists y^e(y = x)$; in the case of a predicative type $\langle t_1, \ldots, t_n\rangle$, it is $\Box\forall X^{\langle t_1,\ldots,t_n\rangle}\Box\exists Y^{\langle t_1,\ldots,t_n\rangle}\Box\forall x^{t_1}\ldots\forall x^{t_n}(Xx_1\ldots x_n \leftrightarrow Yx_1\ldots x_n)$.

Williamson claims that considerations of symmetry in theory choice militate in favor of accepting all such theses or none. I don't want to claim that there is no theoretical pressure in this direction. But I do think that, taking into account only purely formal considerations, a split decision as regards type-e necessitism, on the one hand, and necessitism for all predicative types $\langle t_1, \ldots, t_n\rangle$, on the other hand, is not unprincipled. For it regularly happens in

theorizing with(/about) higher-order languages like ML_P that special provision has to be made for the case of individuals(/expressions of type *e*); this shows up both in axiomatics (for example, as above in the characterization of the correspondence between syntactic types and necessitist theses) and when doing model theory. These precedents suggest that, while there may be strong theoretical pressures to accept $\langle t_1, \ldots, t_n \rangle$-necessitism if and only if one accepts $\langle t'_1, \ldots, t'_m \rangle$-necessitism, considerations of symmetry 'between orders' provide much less reason to expect that *e*-necessitism and $\langle t_1, \ldots, t_n \rangle$-necessitism stand or fall together.

1.2. Parity

A different argument for the conclusion that contingentists should be higher-order contingentists is premised on the claim that the considerations in favor of contingentism correspond to parallel considerations in favor of higher-order contingentism. But is there such parity of motivation?

A first thing to note is that, while many philosophers think that contingentism is obviously true, fewer think that higher-order contingentism is obviously true. So insofar as one is motivated to be a contingentist by an appearance of obviousness, there does not seem to be parity in motivation as regards higher-order contingentism. Having said this, I agree with Williamson that the question of necessitism versus contingentism is not at all obvious, and that it needs to be decided instead on broadly theoretical grounds. So let us set aside the asymmetry of obviousness and consider more theoretical arguments.

Like Williamson, I think that the best theoretical argument against necessitism is that it makes the modal 'float free' of the non-modal in some objectionable way. (Williamson discusses such arguments in Chapter 8.2.) Insofar as such considerations motivate contingentism, do they likewise motivate higher-order contingentism?

Here, I think the answer depends on exactly how the objection to necessitism is understood. One option is to understand the issue in terms of supervenience – for example, in terms of the thesis that all qualitative properties of and relations between individuals supervene on a distinguished class of 'fundamental' or 'perfectly natural' properties and relations. This supervenience thesis is in tension with necessitism given certain essentialist assumptions. Suppose I had never been born and my computer had never been made. According to the necessitist, there would still have been such a thing as me and such a thing as my computer. Presumably neither of us would instantiate any fundamental properties or stand in any fundamental relations – or at least, none that would differentiate us. Yet, given popular essentialist assumptions, we would differ in the (seemingly qualitative) respect of possibly being a person: I would have this property but my computer would not. So there would be things (me and my computer) that differed qualitatively without differing in

any fundamental respect, in violation of the supervenience of the qualitative on the fundamental.

A contingentist can respond by claiming that in the relevant counterfactual circumstances there would have been no such thing as me and no such thing as my computer, thereby blocking the alleged counterexample to the supervenience thesis. On its face, this response does not require also positing any higher-order contingency (for example, it does not require claiming that there would have been no such property as being identical to me). So it seems that, insofar as one's contingentism is motivated by a desire to maintain the supervenience of the qualitative on the fundamental, there are not parallel considerations in favor of higher-order contingentism.

One might reply that the supervenience of the qualitative on the fundamental ought to be understood more broadly so as to concern not only the qualitative properties of individuals but also the qualitative properties of properties of individuals. This stronger thesis might then support a parallel argument for higher-order contingentism, for if in the relevant counterfactual circumstances there still was the property of being me and the property of being my computer, then these properties would seem to differ in the qualitative respect of being possibly instantiated by a person. Arguably, though, they would not be differentiated in any fundamental respects, although it is admittedly much less clear how the operative notion of fundamentality applies to properties of and relations among properties of individuals, especially when such talk is ultimately to be understood in higher-order terms.[2] I am not sure to what extent the motivations for the supervenience thesis concerning properties of individuals generalize to the supervenience thesis concerning properties of properties of individuals, but at any rate Williamson's discussion of the supervenience of the qualitative on the fundamental in Chapter 8.2 is formulated only in terms of properties of individuals.

There are also non-supervenience-theoretic ways of articulating the idea that necessitism makes the modal float free of the non-modal. For example, some contingentists will be motivated by the idea that every truth should be grounded in a 'non-modal' truth (whatever that means). This grounding thesis appears to be threatened by higher-order necessitism. For had there been no such thing as me, there might then seem to be no non-modal ground for the truth that I am possibly a person. Higher-order contingentists can hold onto the grounding thesis by claiming that, in the relevant circumstances, there would have been no such proposition as the proposition that I am possibly a person. (I use 'proposition'-talk as shorthand for claims appropriately formalized using quantification into sentence position, again following Williamson.) This in turn constitutes an argument for (first-order) contingentism, given the assumption that, necessarily, for any individual there is the proposition that it is possibly a person.

On this way of thinking about the modal 'floating free' of the non-modal, the contingentist solution does lead to (and indeed essentially involves) a form of higher-order contingentism. However, at least when the challenge is framed in terms of such propositions as that I am possibly a person, it requires a hyperintensional theory of grounding. This is because that proposition is a necessary truth, and so is necessarily equivalent to the presumably non-modal necessary truth that all chairs are chairs. Since Williamson is rather hostile to hyperintensional metaphysics (more on which later), by his lights the supervenience-theoretic formulation of the 'floating free' worry is a (comparatively) firmer foundation for contingentism than the ground-theoretic worry. And as I argued above, the supervenience thesis that Williamson considers leads to contingentism but does not in any straightforward way lead to higher-order contingentism.

To be clear, in suggesting that the best arguments for contingentism do not correspond to parallel arguments for higher-order contingentism, I am not saying that there are no good arguments from contingentism to higher-order contingentism. There are other ways in which the two positions might be related. For example, one might have the view that all properties and propositions can in some sense be built out of, or pinned down in terms of, the individuals that there are together with qualitative properties of and relations between those individuals. Contingency in which individuals there are might then induce corresponding contingency in which properties and propositions there are, given plausible auxiliary assumptions. Such views about the metaphysics of properties and propositions are certainly worth taking seriously, as are the versions of higher-order contingentism they suggest when combined with (first-order) contingentism.[3] So higher-order contingentism is certainly one principled version of contingentism. But it needn't be the only principled version of contingentism, since the principles motivating contingentism as such do not inevitably lead to higher-order contingentism either by themselves or together with uncontentious metaphysical assumptions.

Before moving on, I'd like to mention one wrinkle about the connection between essentialism and the modal 'floating free' of the non-modal. In Chapter 8.2, Williamson expresses sympathy for an anti-essentialist response, according to which the same qualitative possibilities are open to all individuals – my computer could have been a person, and I could have been a computer, for example. Although I think this form of anti-essentialism is an interesting view in its own right, it is arguably not enough to answer the 'floating free' worry in full generality. This is because those, like Mackie (2006), who are inclined toward such anti-essentialist theses nevertheless want to maintain that possibilities in which I am a computer are far removed from actuality. And it seems plausible that, if a possibility *w* is far removed from actuality, and another possibility *v* is nearby actuality, then in *v* actuality is nearer than *w*. Now consider some nearby possibility *v* in which I was never born and my computer never made. (If you

don't think there are any such possibilities, modify the example accordingly.) Provided that every world in which I am a computer is far removed from actuality, and assuming that the relevant notion of comparative modal distance can be understood in terms of counterfactuals in the familiar way, it follows that in the world where I am never born and my computer is never made I bear the following asymmetric (and plausibly qualitative) relation to my computer: $\lambda xy(\Diamond(Px \leftrightarrow \neg Py) \wedge ((Px \leftrightarrow \neg Py) \mathrel{\Box\!\!\rightarrow} Px))$, where P expresses personhood and $\Box\!\!\rightarrow$ expresses the counterfactual conditional. The failure of this modal relation to supervene on the fundamental is therefore not blocked by mere anti-essentialism. Of course, the anti-essentialist could go further, and say that, among the contingently non-concrete individuals, all qualitative possibilities are equally counterfactually nearby. But this is a much more radical claim than the one Williamson explicitly considers.[4]

1.3. 'Modal tracking'

Williamson also gives a more concrete argument that contingentists should be higher-order contingentists. The argument is that, if contingentism is true, then for any ordinary material thing x (like you or me) it is a contingent matter whether there is a haecceity of x, where a property F is a *haecceity of* x just in case it is necessarily co-extensive with being x ($\Box\forall y(Fy \leftrightarrow y = x)$). Let us turn to that argument.

Williamson writes:

> Informally write 'X tracks y' for 'X is a haecceity of y and X cannot be a haecceity of anything other than y,' with 'X is a haecceity of y' defined as previously. […] [M]y haecceity necessarily tracks me. Even if I had never been, [given higher-order necessitism] there would still have been a property tracking me (and only me). But how can it lock onto me in my absence? In those circumstances, what makes me rather than something else its target? (269)

This passage is puzzling. Williamson appears to be arguing as follows: if he is a contingent being and higher-order necessitism is true, then his haecceity could track him in his absence; but his haecceity could not track him in his absence; so if contingentism is true (and he is a contingent being), we should reject higher-order necessitism. The problem with this argument is that, given the definition of 'tracks' (which, incidentally, seems gratuitous, since the defined notion is equivalent to the notion 'is a haecceity of' in terms of which it is defined), it is uncontroversial that Williamson's haecceity necessarily tracks him: even if there were no such thing as his haecceity, it would still be a haecceity of him, since having it would still be necessarily co-extensive with being him. So while one could treat Williamson's rhetorical question as material for an argument that he is a necessary being (and indeed he considers related arguments in Chapter 6.5), it does not make much sense as a premise in an argument for the

contingent being of his haecceity in a dialectical context where we are granting for the sake of argument that he is a contingent being.

Maybe this is just a slip. After all, Williamson could instead have written 'How could *there have been* something that in my absence locked onto me?'. But if it is a slip, it is a telling one, since the ease of making it suggests that we are mistaking a general puzzling feature of contingentism for a particular puzzling feature of the combination of contingentism and higher-order necessitism.

1.3.1. Modal tracking by accident

Williamson is careful not to claim that, if contingentism is true, then no individual could have had a haecceity in circumstances in which there was no such thing as that individual. Consider a knife *k* made from handle *h* and blade *b*. Suppose *h* and *b* were manufactured but never joined, and so *k* was never made. According to most contingentists, this would be a circumstance in which there was no such thing as *k*. Nevertheless, it might still be a circumstance in which there would be a haecceity of *k*. For in those circumstances, there would be the property of being something that in those circumstances would have been a knife made from *h* and *b* had the two been joined in the appropriate way. And given not unreasonable assumptions, this property would be a haecceity of *k*.

Williamson argues that this point does nothing to suggest that every material object, or even *k*, *necessarily* has a haecceity. For suppose *b* and *h* had never been made, perhaps because the history of the cosmos went quite differently and the solar system never formed. How could we single out *k* in those circumstances in terms of its possible relations to the material things there would then have been? Or consider some elementary particle α. Had there not been that particle (which contingentists will normally agree is possible), how could we single out α in such circumstance in terms of its possible relations to the material things there would then have been?

If we believed only in the material objects recognized by common sense, I agree that the task looks hopeless. However, many metaphysicians believe that there are many more material objects than those recognized by common sense. They start with the idea that a statue and the matter from which it is made, despite coinciding, are different objects, since they differ as regards the possible circumstances in which they would exist. They then conclude that, on pain of arbitrariness, we should say that any eligible modal profile is the modal profile of some possible material object. We can formulate this principle of plenitude in higher-order modal terms without begging any questions about higher-order contingentism: we simply say that, necessarily, for every possibly instantiated property *X* that necessarily is instantiated only by material objects, it is possible that there be a material object *x* that necessarily fuses the things that are *X* (i.e. necessarily, everything that is *X* is part of *x* and every part of *x* shares a part with something that is *X*).[5] Given the not outlandish assumptions

that, necessarily, (1) there is at least one material object, and (2) any two material objects that necessarily coincide (in the sense of sharing parts with the same things) are qualitatively discernible, the principle of plenitude allows us to argue that, necessarily, every material object necessarily has a haecceity, where we assume only that there is a property corresponding to any condition specified in terms of individuals there are and their qualitative properties and relations.[6] Assuming that, necessarily, every non-material object (numbers, sets, etc.) can be singled out in terms of its qualitative properties and relations to material objects, this entails that, necessarily, everything necessarily has a haecceity.

There are other independently motivated and contingentist-friendly metaphysical principles that have this conclusion as an unintended consequence. For example, if we accept the principle of conditional excluded middle for counterfactuals (roughly, the principle that negating a non-vacuous counterfactual is equivalent to negating its consequent), we can argue that necessarily everything necessarily has a haecceity from the premise that, necessarily, any two contingent beings are possibly qualitatively discernible.[7] In general, it strikes me as a wide open question whether contingentists should be higher-order contingentists, turning on many subtle question about superficially unrelated matters.[8]

2. The 'cash-value' argument

The most challenging part of *Modal Logic as Metaphysics* is the extended argument for necessitism in Chapter 7. In this Section, I want to raise some worries about that argument.

2.1. The formal result

First, let me informally describe the formal results underlying the argument. I will make some simplifications, which I will note along the way.

Williamson has us consider two theories: *chunky-style contingentism* (CSC) and *chunky-style necessitism* (CSN). CSC consists of the claim that, necessarily, everything is 'chunky' – we will consider later how this predicate ought to be interpreted. CSN is the combination of necessitism, the claim that everything could be chunky, and a claim, for each primitive predicate of the language, to the effect that it is chunkiness-entailing in all of its arguments ($\Box\forall x_1 \ldots \forall x_n(Rx_1 \ldots x_n \rightarrow (Cx_1 \wedge \ldots \wedge Cx_n))$).

Williamson then considers two modal languages that differ only in that, while one contains only individual quantifiers, the other contains plural quantifiers too.[9] It does *not* contain higher-order quantifiers in the sense of 'higher-order' that has been operative throughout this paper – i.e. for no types $t_1, \ldots, t_n$ in the type hierarchy defined earlier does it contain quantified variables of type

$\langle t_1, \ldots, t_n \rangle$. This point is worth emphasizing (and Williamson does emphasize it), since his notational choice to use 'Xx' to regiment 'x is one of X' might suggest that 'X' is a variable of type $\langle e \rangle$, when in fact it is a plural variable that does not fall under any type in the aforementioned type hierarchy.

Williamson next defines a consequence relation $\vDash$ in the familiar way, using variable-domain Kripke models. Plural quantifiers range over sets of individuals in the domain of the world of evaluation. An individual(/tuple of individuals) is in the extension of a monadic(/polyadic) predicate at a world only if it is(/they are all) in the domain of that world. In this way, we validate the *being constraint* ($\Box\forall x_1 \ldots \Box\forall x_n \Box(Rx_1 \ldots x_n \rightarrow \exists y(y = x_i))$, for $1 \leq i \leq n$): informally, all atomic predications entail the being of the individuals of which they are predications. Note, however, that the imposition of the being constraint is not essential to the overall argumentative strategy – parallel theorems can be established in a setting where the constraint is relaxed provided we modify CSC, CSN, the definition of a model, and the definition of 'neutrality' (to be explain presently) in corresponding ways; see Fritz (2013).

Lastly, Williamson defines a *neutral* formula to be any formula logically equivalent to a formula in the image of a recursively defined mapping $(\cdot)^{\text{con}}$ from formulas to formulas. Informally, the effect of this mapping is to restrict all individual quantifiers to chunky things, all plural quantifiers to pluralities of chunky things, and to conjoin all atomic predications with claims to the effect that the individuals involved are chunky. The idea is that neutral formulas are those that are concerned only with 'the realm of the chunky'.

Say that A is *equivalent to B given* Γ just in case $\Gamma \vDash A \leftrightarrow B$. Williamson's main results are as follows. In the language with only singular quantification, every formula is equivalent to a neutral formula given CSC and equivalent to a neutral formula given CSN. By contrast, in the language enriched with plural quantification, although every formula is equivalent to a neutral formula given CSC, some formulas are not equivalent to any neutral formula given CSN.

2.2. Philosophical motivation

Williamson's theorem does not wear its philosophical significance on its sleeve. He explains its relevance roughly as follows.

Imagine two metaphysicians, Kit and Bob. It is common knowledge between them that Kit is a necessitist and Bob is a contingentist. Despite this metaphysical disagreement, they are generally trusting of each other. Kit often finds that, when Bob asserts something incompatible with his necessitism, Kit is able to find a kernel of truth in Bob's utterance – intuitively, he is able to factor out Bob's contingentism from his utterance and obtain something that both of them could in principle agree on. For example, when Bob says that there could have been no such thing as the Eiffel tower (which is inconsistent with necessitism), Kit – being trusting of Bob *modulo* his contingentism – comes to

believe that there could have been no such concrete object as the Eiffel tower. This claim has the advantage of being consistent with both of their respective metaphysical visions and equivalent to what Bob said given Bob's general views about contingent being. Conversely, suppose Kit says that something non-concrete could have been a child of Wittgenstein. This is inconsistent with Bob's brand of contingentism. Nevertheless, Bob seems to be able to factor out the necessitism from Kit's claim resulting in something that both of them could in principle agree on – for example, the claim that it is possible that something be Wittgenstein's child. This claim is consistent with both of their respective metaphysical visions and equivalent to what Kit said given Kit's brand of necessitism.

There seems to be something systematic going on here. Necessitists can learn from contingentists and vice versa, by extracting 'neutral cash value' from each other's utterances: sentences that are neutral, in the sense of being orthogonal to their background metaphysical disagreement, and cash value, in the sense that the claim extracted is as good as the statement from which it was extracted to the person who made the latter statement and so (setting metaphysical debates aside) can serve equally well their goal of exchanging information.

The theories CSC and CSN are meant to formalize the respective metaphysical positions of interlocutors like Kit and Bob, and the notion of a neutral formula is means to formalize the informal notion of neutrality just described – namely, the notion of being orthogonal to their background metaphysical disagreement. The idea is that Kit and Bob's disagreement permits agreement on a wide range of matters – in particular, on matters regarding only 'chunky' individuals. But chunkiness is not merely characterized in terms of what Kit and Bob can agree on. It also plays an important role in their respective metaphysical visions. In particular, Bob thinks that everything is chunky – it is this together with a recognition of the contingency of chunkiness that leads him to be a contingentist in the first place. Kit, by contrast, thinks that everything could be chunky. This is motivated by his concern only for matters chunky – his necessitism and recognition of the contingency of chunkiness forces him to countenance things that are contingently non-chunky, but leaves him free to deny that any things are necessarily non-chunky.

Williamson's theorem shows that, insofar as their discourse can be regimented in the formal languages he considers, and their theoretical commitments faithfully captured respectively by CSC and CSN, Kit will always be able to extract a neutral cash value from Bob's utterances: sentences only about the chunky, and so orthogonal to their metaphysical dispute, and yet equivalent given Bob's commitments to the original utterances. (Such equivalents are delivered by the mapping $(\cdot)^{\mathrm{con}}$.) And Bob can do the same for Kit's utterances of sentences that can be formalized in the plural-quantification-free fragment of their common language. But some of Kit's sentences involving plural

quantification can be shown to have no neutral equivalents for him. Kit's assertion that Jack and Jill stand in the ancestral of the relation of being possible nemeses is an example, where the ancestral (i.e. transitive closure) of a condition is defined using plural quantification in the familiar way.

This limitative result is supposed to be pretty embarrassing for Bob – indeed, embarrassing enough to make him reconsider his commitment to CSC. And reflection on Bob's embarrassing predicament is meant to suggest that all of us have strong reason to reject contingentism. The embarrassment is supposed to consist in the fact that, by Bob's lights, he can't quite make sense of what Kit is up to – of what picture Kit has about the possibilities for chunky things that is behind some of his utterances. And that seems absurd: Bob can understand perfectly well how Kit is thinking. If his metaphysical scruples prevent him from being able to articulate that picture of modal reality, then so much the worse for those scruples.

2.3. Worries about the mode of argument

This is not a familiar mode of argument, and I don't think it is a good one.

The most obvious objection is the most straightforward: whether one can find neutral equivalents of one's interlocutor's utterances is in general not a good test of the tenability of one's position. For one thing, it is usually not possible for either party. Consider a dispute between a proponent of string theory and a proponent of loop quantum gravity, or between a Christian and a Muslim, or about pretty much anything. In all such disputes, when the dispute is in clear view and the people involved are intelligent and communicating in good faith, it will be possible for them to learn from each other in ways that to a large extent admit of systematic generalizations and that are naturally described as attempts to find the kernel of truth in what the other person says. But there won't be an algorithm that meets a standard anything like the one to which Williamson is holding the chunky-style contingentist. Perhaps many theoretical disagreements can be sidestepped most of the time, but it is hard to think of any interesting theoretical disagreements that can be sidestepped all of the time, even by one party.

Note also how fragile the possibility of neutral cash value extraction is in the case at hand. Consider a parallel dispute between Kit* and Bob*, who respectively accept C*SN and C*SC, which differ from CSN and CSC in that they concern not chunkiness but a closely related property chunkiness*.[10] Neither Kit nor Bob accepts C*SN or C*SC, and neither Kit* nor Bob* accepts CSN or CSC. So Kit will not be able to always produce neutral equivalents of Bob*'s utterances. What does Williamson's mode of argument predict about this case? It can't be that everyone ought to feel pressure to give up their view. Moreover, it seems like, in whatever pre-theoretically obvious sense Kit can learn from Bob, Kit can learn from Bob* too. In general, the possibility of 'neutral cash

value extraction' is neither a good test of theoretical adequacy nor a good test of the extent to which interlocutors can in some pre-theoretically recognizable sense learn from each other's discourse. This is true even for disputes only slightly removed from the one Williamson has us imagine.

Here is another way to dramatize the point. Williamson notes that, on many salient interpretations of 'chunky,' real necessitists are not chunky-style necessitists, since they believe in things that most contingentists think there could not even possibly be – for example, they believe that there is a non-empty set of all of Wittgenstein's possible children. Suppose Kit told Bob that the set of Wittgenstein's possible children was his favorite set, despite the impossibility of all of its members being chunky together. On pain of inconsistency, Kit must not accept CSN, since his commitments are incompatible with the atomic predicates 'is a member of' and 'is the favorite set of' both being chunkiness-entailing in the way that CSN requires. His background necessitist theory is then presumably something weaker than CSN, and this fact will prevent Bob from being able to find a neutral equivalent of Kit's utterance, since Kit's background theory will make fewer sentences equivalent than CSN does. In this connection, Williamson says that in confining his attention to the chunky-style necessitist he is making things easier for the contingentist. This is true in the sense that it makes it easier for them to rise to the challenge he has set for them. But it also suggests that he has not set them the right challenge. For there doesn't seem to be any sense in which Bob ought to be embarrassed by some inability to make sense of what Kit was getting at here.[11]

A different worry about the argument concerns the notion of neutrality. Consider some sentence *A* (such as the aforementioned ancestral-involving one) that is not equivalent given CSN to any neutral sentence. Williamson's theorem establishes that there is such a sentence. But this is not yet to establish that there is no sentence equivalent to *A* given CSN that is intuitively not at issue in Kit and Bob's metaphysical dispute. That would require an argument that all such intuitively not-at-issue sentences are neutral in the technical sense. Williamson treats this claim as a working hypothesis, but never argues for it at any length. *Prima facie*, there would seem to be counterexamples. For example, it is common ground between Kit and Bob that there are no dragons – this certainly looks like something independent of their metaphysical dispute by appeal to which Bob ought to be able to at least try to find common ground with Kit. But '$\neg\exists x Dx$' is not neutral in Williamson's sense, since it is not equivalent to any sentence whose quantifiers are explicitly restricted by the predicate 'is chunky.' Of course, this point doesn't suggest any sentence equivalent to *A* given CSN that, though not neutral, is intuitively orthogonal to their metaphysical disagreement. But it highlights one further respect in which the formal result is some distance from the pre-theoretical phenomenon it is intended to characterize.

2.4. Worries about 'chunkiness'

So far I have left the notion of chunkiness schematic, as Williamson does to a large extent. But it cannot be left completely schematic. For one thing, if we allow that the sorts of hypothetical interlocutors we are interested in might differ in their interpretation of 'chunky', then Williamson faces the challenge of explaining why Kit isn't in as bad shape with respect to Bob* as Bob is in with respect to Kit.

Williamson does in fact elaborate on the sort of thing he has in mind. At some points, he characterizes being chunky as being grounded in the concrete, and at other times as being not contingently non-concrete. But although these notions might coincide according to proponents of CSC and CSN, they do not coincide according to Williamson: insofar as he is willing to operate with the relevant notion of grounding (about which he sometimes voices reservations) he thinks that impure sets of possibly concrete but not possibly co-concrete objects are neither grounded in the concrete nor contingently non-concrete. Maybe according to Williamson we should imagine Kit and Bob as accepting CSN/CSC on both interpretations of 'chunky,' and also believing – falsely, according to Williamson – that necessarily everything is, necessarily, grounded in the concrete just in case it is not contingently non-concrete, but he does not say so explicitly.[12]

A different strategy for isolating the intended notion of chunkiness is in terms of its role in motivating contingentism. Williamson writes:

> Why do contingentists reject the necessitist postulation of contingently non-concrete objects, such as merely possible people? As just noted, the reason is often not any objection to the non-concrete as such. It may rather be an objection to the *contingently* non-concrete. (314, emphasis original)

More generally, the suggestion is that chunkiness is whatever condition is both uncontroversially contingent and, by contingentists' lights, necessarily equivalent to being identical to something.

One problem with this suggestion is that not all contingentists are motivated to be contingentists by this sort of reasoning – as Williamson puts it, not all contingentists are chunky-style contingentists. Williamson writes as if most familiar versions of contingentism are chunky-style, so that his discussion of CSC applies to most actual contingentists. This strikes me as both a sociological and a dialectical mistake. As for the sociology, I think that most contingentists – at least, those who are motivated by general theoretical considerations – are motivated by some version of the aforementioned worry that necessitism makes the modal float objectionably free of the non-modal. This is an argument for contingentism of a very different shape from the one suggested in the passage just quoted.[13]

The dialectical error is more important. Of non-chunky style forms of contingentism, Williamson writes:

> The challenge to proponents of other forms of contingentism is to show rigorously how their favored form overcomes the limitations of CSC explained in this Chapter. (315)

This seems to me to get the situation backwards, and in so doing to highlight one of the most puzzling features of Williamson's setup. In that setup, the necessitist is judged on the basis of how well he can come up with neutral equivalents of the contingentist's claims, and the contingentist is judged on the basis of how well he can come up with neutral equivalents of the necessitist's claims. But the relevant notion is equivalence by the lights of the *speaker*, not by the lights of the hearer. Bob's commitment to CSC, or any other version of contingentism, has no bearing whatsoever on which sentences of Kit's he can find equivalents of. That depends only on Kit's commitments. On the other hand, Bob's commitment to CSC is crucial for Kit: If Bob didn't have that commitment, then Kit would be unable to come up with neutral formulas equivalent by Bob's light to various of his claims. So insofar as we need to take such contingentists seriously, Williamson should see this as a challenge for necessitists, not for contingentists. And we should take such contingentists seriously. After all, it is not as though supervenience-motivated contingentists are any harder for necessitists to learn from than are their hypothetical chunky-style cousins.

(One might think that this misses the point that what counts as neutral in a dispute depends on the respective theories of the disputants. In reply: that kind of dependence only amplifies the problem. For the less the contigentist is committed to, the more is up for grabs, so if anything *fewer* sentences should count as neutral, in which case it will be harder still for the necessitist to find neutral equivalents of contingentists' discourse. Of course, maybe this more demanding notion of neutrality would also make it harder for the contingentist to extract neutral equivalents of necessitists' discourse, but if so it's a wash – we would be left in the normal situation in theoretical disputes where for no side is every claim equivalent by its lights to something that is not in dispute. And that would be enough to undermine Williamson's argument, since then there wouldn't be the relevant sort of asymmetry between necessitism and contingentism.)

Later on, Williamson himself makes an exactly parallel point in the other direction. He is responding to the suggestion that contingentists might try to get around his argument by endorsing some version of Plantinga's theory of individual essences. He writes:

> [The strategy] does not fit the dialectical context. […] [T]he present challenge is to find neutral equivalents for plurally quantified sentences given a necessitist theory. The Plantinga-style postulates (45)–(47) had to be added to the necessitist [theory], not to the contingentist [theory]. Thus, the question is not whether contingentists have good reason to postulate (45)–(47), but whether necessitists have. Perhaps a few necessitists will like (45)–(47). But they are not needed to

> solve any problem for necessitists, for they have no special difficulty in making sense of quantified modal logic. (352)

Williamson is entirely correct that, in the present dialectical context, the contingentist's metaphysical commitments regarding individual essences are completely irrelevant. But this is an indication that something has gone wrong with the dialectic.

What has gone wrong is that, in the case of the Plantinga-style contingentist, incompatible dialectical constraints are being imposed on the notion of chunkiness. On the one hand, chunkiness has to be a sufficiently undemanding property that it can encompass everything the contingentist believes in, since CSC says that, necessarily, everything is chunky. On the other hand, chunkiness has to be a sufficiently demanding property that to restrict one's attention to the chunky is to restrict one's attention to an arena isolated from questions of necessitism versus contingentism. For at least a certain Plantinga-style contingentist in a dispute with a necessitist skeptical of individual essences, no notion plays both roles, because the question of whether there are individual essences is, for him, intimately tied up with the question of necessitism – essences are not neutral ground, despite being countenanced by the contingentist. (For example, following Jager (1982), the imagined contingentist might postulate such essences in order to make sense of possible-worlds model-theory for modal logic, which is something necessitism would have allowed him to do by other means.)

2.5. Adding higher-order quantification

Williamson argues at length that the existence of formulas not equivalent to any neutral formula given CSN is robust with respect to various ways of enriching the modal language with infinitary conjunction and infinitary quantification. But he does not consider whether the result is robust with respect to enriching the language with higher-order quantifiers – i.e. by allowing for quantified variables of predicative types of the type-hierarchy described earlier. This might seem like a strange omission, given the focus on such quantification in the previous two chapters of the book. But the reason for the omission is clear enough. In the case of plural quantification, there is a fairly obvious way of using variable-domain Kripke models to define a consequence relation for the expanded language, and likewise an obvious way of extending the notion of a neutral formula to the expanded language (i.e. of adding the appropriate clause for plurally quantified formulas to the definition of the mapping $(\cdot)^{con}$). By contrast, in the case of higher-order quantification, neither issue is straightforward.

Suppose we were to resolve the two issues as follows. We extend the consequence relation to the higher-order language by considering the class of intensional models that validate the *unrestricted comprehension* schema

$\exists X^{\langle t_1,\ldots,t_n\rangle}\Box\forall x_1^{t_1}\ldots x_n^{t_n}(Xx_1\ldots x_n \leftrightarrow A)$, and hence validate higher-order necessitism. (Following Williamson, we count the result of prefixing an instance of a schema with any string of universal quantifiers and necessity operators as itself an instance of the schema; we also require that X not occur free in A.) As for the definition of neutrality, we have a trivial clause for higher-order quantifiers, letting $(\forall X^{\langle t_1,\ldots,t_n\rangle}A)^{\mathrm{con}} := \forall X(A)^{\mathrm{con}}$. In such a setting, every formula *A will* be equivalent to a neutral formula given CSN. (Informally, claims involving quantification over modally rigid properties of necessarily existing haecceities will count as neutral equivalents of necessitists' claims involving plural quantification.) In Williamson's dialectical setting, this is the sense in which higher-order necessitism might afford the contingentist a way of making sense of necessitist's discourse. What matters is not that higher-order necessitism is something the contingentist happens to accept, but rather that it forms part of the background of their dispute with the necessitist, in a way that is reflected both in the definition of the relevant consequence relation and in the definition of a neutral formula.

By contrast, we might define the consequence of relation and the notion of neutrality in a more complicated way that would be friendly to higher-order contingentism. Recall the view, mentioned earlier, that there are all and only those propositions, properties and relations whose identities can be 'pinned down' in terms of qualitative properties of and relations among individuals there are. Fine (1977b) and Fritz and Goodman (forthcoming-b) show how to define classes of intensional models that are naturally seen as corresponding to this general vision, and Fritz and Goodman also show how these ideas might be encoded in an object-language comprehension principle.[14] Using these ideas, we might consider a weaker, higher-order-contingentism-friendly consequence relation that corresponds to the broader class of models alluded to. We might also adopt a non-trivial clause for higher-order quantification in the characterization of a neutral formula, by requiring that the quantifiers be restricted to entities of the relevant type that are pinned down in terms of the qualitative properties of and relations between the chunky individuals there are, in the sense formalized by the comprehension principle alluded to above. In light of recent work by Peter Fritz, it seems safe to conjecture that, relative to this consequence relation and definition of neutrality, *not* all formulas will have neutral equivalents given CSN.[15]

We can also consider mixing and matching these options. That is, we could consider a higher-order-contingentism-friendly consequence relation but not impose any restriction on the higher-order quantifiers in the definition of a neutral formula, or consider a higher-order-necessitist consequence relation but require neutral formulas to be equivalent to ones all of whose higher-order quantifiers are restricted to entities that can be pinned down in terms of qualitative properties of and relations among chunky individuals. It seems fairly safe to conjecture that, on either split decision, there will be formulas not

in-the-operative-sense-equivalent to any in-the-operative-sense-neutral formula given CSN.

So there is some hope that by 'going higher-order necessitist' the contingentist might be able to answer Williamson's challenge in the form he poses it. But their higher-order necessitism must be extremely thoroughgoing: it must form part of the background logic that characterizes their dispute with the necessitist. (Provided this condition is met, it seems reasonable not to impose any restriction on the higher-order quantifiers in the definition of a neutral formula, despite the formal possibility of such a split decision.) This point is relevant to views like those discussed earlier, according to which higher-order necessitism falls out as an unintended consequence of some substantive metaphysical thesis like a certain plenitudinous modal mereology. In a debate between such a contingentists and a necessitist, it seems inappropriate to describe higher-order necessitsim as something to which they are each committed as a matter of 'logic,' although admittedly the issue is somewhat murky.

By contrast, consider the character Williamson dubs the 'ultra-minimalist contingentist,' who 'lay[s] down [the unrestricted] comprehension principle [as something] attractive simply […] for its general theoretical virtues, and derive[s] the non-contingency of higher-order being as a corollary, but uphold[s] the contingency of first-order being as common sense. Such an ultra-minimalist contingentist abjures any attempt to explain or justify the asymmetry [as regards necessitism at different orders] on deeper metaphysical grounds, as likely just to lead to trouble.' (275,276) Unlike the plenitude-motivated higher-order necessitist, the ultra-minimalist contingentist accepts unrestricted comprehension in much the same spirit as the necessitist does. So it does seem appropriate, in considering a dispute between such a contingentist and a necessitist, to treat instances of unrestricted comprehension as theorems of the background logic characterizing their disagreement. Of course, Williamson has other arguments against ultra-minimalist contingentism, which we have considered already. But as far as the argument of Chapter 7 is concerned, it seem to me that – even if we set aside all of the general worries about the argument – the ultra-minimalist contingentist comes out unscathed, because he can for any given formula produce a higher-order formula that is both in the dialectically relevant sense neutral and in the dialectically relevant sense logically equivalent to the original formula given CSN. If that is right, then even considered on its own terms Williamson's argument fails to touch all forms of chunky-style contingentism.

2.5.1. Adding primitive higher-order identity

I want to briefly mention another way in which Williamson's argument is not robust with respect to a certain way of enriching the background language with higher-order devices. Suppose that for every type t we enrich our language with a primitive identity predicate of type $\langle t, t \rangle$. Suppose further that the dialectical

situation is such that we may treat as logical axioms these predicates' reflexivity ($a^t =^{\langle t,t\rangle} a$) and obeying Leibniz's law ($a^t =^{\langle t,t\rangle} b^t \rightarrow A \leftrightarrow A[b/a]$, provided b is free for a in A). (The schematic letters 'a' and 'b' can be instantiated with simple or complex expressions of the relevant type, and as before we count any result of prefixing an instance of a schema with a string of necessity operators and universal quantifiers as itself an instance of the schema.) In order to allow the contingentist to be a higher-order contingentist, we do not require the identity predicates or lambda-terms to satisfy the 'being constraint' (explained in Section 2.1 above), although we may still insist on the being constraint for all primitive predicates other than the identity predicates. Now consider the consequence relation corresponding to the class of models obtained by modifying the clauses in Fritz and Goodman (forthcoming-b) in the natural way so as to interpret lambda-terms and to validate the axioms governing the primitive identity predicates. It turns out that, with respect to this consequence relation, every formula *is* equivalent given CSN to a neutral formula (even if in the definition of neutrality we require that quantifiers be restricted in the way discussed above).[16] Fritz and Goodman (fothcoming-a, [Section 3.6]) discuss the philosophical tenability of this version of higher-order contingentism in a related dialectical context, to be explained presently.

3. A different dialectical strategy

In the last section, I gave a somewhat negative assessment of Williamson's argument in Chapter 7 of *MLaM*. But I do think there is a good (though not decisive) argument for necessitism in the vicinity, which draws on a similar combination of observations about the intelligibility of superficially 'necessitist' discourse and formal results about the undefinability of various classes of variable-domain Kripke-models. That argument is developed in detail in Fritz and Goodman (fothcoming-a). Here, I will simply sketch the argument, highlighting some ways in which its dialectical structure differs from Williamson's.

Williamson challenges contingentists to make sense of the discourse of a certain imaginary character, the chunky-style necessitists. As I see the situation, the genuinely pressing challenge for contingentists can be posed without considering any such character. This is because contingentists themselves, as ordinary English speakers, feel the temptation to talk in superficially necessitist ways – to make such speeches as 'there are n possible knives that could be made from a given spare handle and n spare blades' and 'most possible people will never be born.' Of course, mindful of their contingentism, if pressed they will not accept these sentences (or at least their most syntactically faithful renderings in a formal language) as literally true on a metaphysical interpretation of their modalities and an unrestricted interpretation of their quantifiers. Nevertheless, it is implausible that we fail to systematically cognize and communicate sensible claims about modal reality through the use of these

sentences (even if this use is characterized by some sort of hedging). The question, then, is what we are up to.

On its face, this seems like a more pressing challenge than Williamson's. When asked to find the kernel of truth in the discourse of someone you disagree with, there is always the option of saying that there is no way of extracting from their utterance something equivalent to it by their lights and reasonable by your lights. But this option is unavailable if the challenge is that of self-understanding. Contingentists ought to recognize that they themselves have a systematic way of using quantificational expressions to communicate claims about, as it were, 'merely possible' people. They therefore face a challenge to come up with a systematic paraphrase of such 'modalized' uses of quantifiers: to produce sentences in which the quantifiers are interpreted unrestrictedly that literally express the propositions they have in mind when they feel the pull of superficially necessitist ways of speaking.

Note that, unlike certain debates in the literature on actualism and possibilism (which Williamson rightly criticizes), this way of thinking about the challenge does not assume that necessitists and contingentists speak different languages between which we are for some reasons compelled to find a translation. For one thing, the protagonists 'the necessitist' and 'the contingentist' are nowhere to be found – everyone, regardless of their commitments, faces the challenges of making sense of the kind of 'modalized quantification' to which I have alluded (and of which Fritz and Goodman give many examples); necessitism simply offers the most straightforward answer to this challenge. Of course, if contingentism is true, then these uses of sentences are either strictly speaking false, or not properly formalized in the way the surface syntax suggests, or their quantifiers are not being given an unrestricted interpretation and their modal operators the relevant metaphysical interpretation.[17] So unlike in Williamson's setup, the discourse that contingentists are being challenged to make sense of is not discourse that is taken by all of those who are inclined to engage in it – namely, not by the contingentists themselves – to be literally true on the unrestricted/metaphysical interpretation, at least not when formalized in the obvious way. (I suspect that it was a desire to avoid considering such discourse that lead Williamson to construct the dialectic that he did.) But this difference between Fritz and Goodman's argument and Williamson's does not constitute a slide back into the old actualism/possibilism debate.

Indeed, in summarizing his own argument for necessitism in Chapter 7 of *MLaM*, Williamson writes as if the challenge he really has in mind is something much like the one I have just sketched – namely, to isolate the propositions obviously in the vicinity of certain uses of quantified modal sentences on the assumption that, because of certain contingentist assumptions, they cannot be the propositions literally expressed by those sentences on a flat-footed interpretation. Here is the relevant passage:

> In short, the necessitist can draw more distinctions than the contingentist can. Every distinction the contingentist can draw can be drawn in neutral terms, so the necessitist can draw it too. The converse fails. The necessitist can draw distinctions the contingentist cannot, because they cannot be drawn in neutral terms. That would not matter if those extra distinctions were bogus. But the contingentist cannot plausibly dismiss them like that, because they are too intimately related to distinctions the latter is committed to regarding as genuine. Thus necessitism provides a clearer view than contingentism of modal reality. (364)

This passage is hard to square with Williamson official dialectical setup, because that setup is concerned with literal unhedged discourse in a common formal language, and anything the necessitist can say in that language the contingentist can say too. The passage seems more in keeping with the way of framing the argument for necessitism that I have been recommending: certain ways of speaking that have a necessitist flavor seem to correspond to sensible ideas; yet these ideas are such that, if contingentism is true, then they are not expressible in the relevant formal languages (because we can prove that associated classes of models are not definable in those languages); so we should reject contingentism.

One advantage of this argumentative strategy is that it dispenses completely with all talk of 'chunkiness.' The restriction to neutral formulas falls away too, since the issue is not framed in terms of any actual or hypothetical dispute. (Of course, there are plenty of methodological challenges that our argument raises that Williamson's does not; we try to address these as best we can in our paper.)

Despite the many differences between our preferred argumentative strategies, though, many of the relevant issues are parallel. For one thing, the model-theoretic results and proof strategies are similar – see Fritz (2013). For another thing, the question of whether being a higher-order necessitist (or countenancing a family of non-being-constrained primitive higher-order identity predicates) affords the contingentist a solution to the challenge turns on similar considerations about whether we can reasonably restrict our attention only to models in which the relevant metaphysical principles hold.

One technical difference worth highlighting is that, while Williamson frames his challenge in terms of plural quantification, Fritz and Goodman frame it in terms of generalized quantifiers (focussing on the non-first-order-definable generalized quantifiers 'there are uncountably many' and 'most'). An advantage of this way of framing the challenge is that it allows us to see an argument Williamson presents in Section 6.4 against higher-order contingentism as a species of whatever general phenomenon is meant to be dramatized in the case of plural quantification (despite the fact that the arguments are presented as independent). Williamson claims that, for the purposes of 'second-order modal mathematics,' we need to be able to instantiate a certain modalization of the claim that a given condition $\leq$ is a complete order – i.e. the claim that,

for every possible property X, being possibly $\leq$ has maximal element among the possible X's – with any condition $\varphi(x)$, even relative to an assigment of incompossible entities to parameters occurring in it chosen so that the open formula $\varphi(x)$ fails to express even a possible property. On its face, this seems like simply a bald assertion that the higher-order contingentist might simply reject as a consequence of his overall view. But that would be a mistake. For the condition of being a complete order is a generalized quantifier with two variables, regarding which we can raise the challenge for contingentists to make sense of the corresponding 'necessitist discourse' or 'modalized use' thereof.[18] The invalidity of the relevant inference by higher-order contingentist's lights (and Fritz and Goodman forthcoming-b argue that they should think it is invalid) shows that simply modalizing the ordinary higher-order definition of a complete order does not achieve the desired effect of expressing the intended structural constraint on the patter of satisfaction of being possibly $\leq$ by all possible individuals, as it were. The appeal to second-order modal mathematics can then be understood simply as a reminder that it seems like such claims make perfect sense (although the paticular example is rather involved). What the relevant formal results show is that, in the case of many non-first-order definable generalized quantifiers, it is not just that certain natural ways of sprinkling modal operators into their ordinary non-modal higher-order definitions fail to express the intended condition on models, but indeed no formula express the intended condition.

4. Higher-order logic as metaphysics

In my view, the greatest service Williamson did in writing *MLaM* has nothing to do with modal metaphysics in particular: it was to forcefully show that higher-order languages are a powerful tool for metaphysical theorizing. I hope and believe that this kind of higher-order metaphysics is the way of the future. I want to close by considering two issues arising in this connection.

4.1. Grainularity

Williamson operates throughout the book on the assumption that necessary co-extensiveness suffices for the identity of propositions, properties, and relations, where this is understood as at least entailing their higher-order indiscernibility. But the status of this assumption is not entirely clear. Consider, in particular, the following passage:

> Hyperintensionality arises at the level of thought and linguistic meaning, and should be explained at that level, not at the level of anything like a general theory of properties and relations. For present purposes, a coarser grained intensional standard of individuation is more plausible, and certainly much simpler. (266)

I happen to disagree with the claim that hyperintensionality (in the sense of distinctions among necessarily extensional equivalents) arises only at the level of thought and language, but let's set that aside. What I don't understand is Williamson's suggestion (made throughout the book) that the granularity of reality is something that can be relativized to our purposes. One thing Williamson could mean here is that, for present purposes, he is restricting his higher-order quantifiers to entities that don't draw any hyperintensional distinctions.[19] But if that is how he intends to be understood, it seems to conflict with his insistence that his quantifiers are always to be read as unrestricted (although maybe he is only talking about his first-order quantifiers?).

A different thing that someone might mean by this passage is that, among the abstract objects, there are many families of property-like things, that these families disagree as regards their fine-grainedness, that for different theoretical purposes it is most fruitful to use 'property' to talk about different ones of these families, and that for present purposes it is best to interpret 'property'-talk as being about members of the modally-individuated family of property-like abstracta. But this cannot be what Williamson means, because he does not think that higher-order quantification is or can be analyzed as some sort of tacit first-order quantification over a realm of abstract objects.

The great promise of higher-order logic as metaphysics, from my perspective, is that it lets us ask questions about fineness of grain using no non-logical predicates like 'property' or 'propositions' that might then be claimed to admit of different disambiguations, and from which scholastic metaphysics then ensues. For we can unambiguously interpret the dyadic sentential operator $\lambda p^{\langle\rangle} q^{\langle\rangle} (\forall O^{\langle\langle\rangle,\langle\rangle\rangle} (Op \leftrightarrow Oq))$ as involving absolutely unrestricted and irreducibly higher-order quantification into monadic sentential operator position. In terms of this notion, we can frame competing hypothesis about reality's granularity: i.e. necessary and/or sufficient conditions on p being higher-order indiscernible from q. I believe that such questions are among the deepest and most exciting in all of metaphysics. They are deep because of their widespread ramifications, and exciting because they lend themselves to the kind of abductive investigation aided by formal methods that Williamson advocates in the Afterword of *MLaM* and inspiringly demonstrates throughout the book.

Williamson's rhetoric surrounding these issues unfortunately (and uncharacteristically) gives the impression that questions of granularity are to some extent pragmatic ones. I don't think that Williamson really thinks this, but a naive reader could be forgiven for thinking otherwise.

4.2. A non-modal argument for necessitism

Although I have been critical of some of Williamson's arguments for necessitism, I am a necessitist myself. The argument that most convinces me is not the

one I described in Section 3, which I think can be resisted by adopting higher-order necessitism in the right spirit. I am motivated rather by considerations having nothing to do with modality in particular, but instead by independently attractive principles about fineness of grain.

Using only Boolean connectives and higher-order quantification, we can for all types $\langle t_1 \ldots t_n \rangle$ define a higher-order analogue of identity $\approx$ in terms of higher-order indiscernibility:

$$\approx^{\langle \langle t_1 \ldots t_n \rangle, \langle t_1 \ldots t_n \rangle \rangle} := \lambda x^{\langle t_1 \ldots t_n \rangle} y^{\langle t_1 \ldots t_n \rangle} (\forall X^{\langle \langle t_1 \ldots t_n \rangle \rangle} (Xx \leftrightarrow Xy)).$$

We can also define Boolean operations on all such types using lambdas (e.g. $X^{\langle t_1 \ldots t_n \rangle} \wedge Y^{\langle t_1 \ldots t_n \rangle} := \lambda x_1^{t_1} \ldots x_n^{t_n} (Xx_1 \ldots x_n \wedge Yx_1 \ldots x_n)$). This allows us to define, for all types $\langle t_1 \ldots t_n \rangle$, relations like

$$\leq^{\langle \langle t_1 \ldots t_n \rangle, \langle t_1 \ldots t_n \rangle \rangle} := \lambda x^{\langle t_1 \ldots t_n \rangle} y^{\langle t_1 \ldots t_n \rangle} (x \approx (x \wedge y))$$

and

$$\leq'^{\langle \langle t_1 \ldots t_n \rangle, \langle t_1 \ldots t_n \rangle \rangle} := \lambda x^{\langle t_1 \ldots t_n \rangle} y^{\langle t_1 \ldots t_n \rangle} ((x \wedge (y \rightarrow y)) \approx (x \wedge y)).$$

Given a sufficiently coarse-grained view of higher-order reality, such relations will satisfying general principles characteristic of a notion reasonably pronounced 'entails.'[20] We can then abductively investigate general principles governing entailments among properties and relations.

In particular, we can investigate the entailment theoretic properties of quantifiers: that is, how entailment relations among generalizations are related to the entailment relations among the conditions being generalized. In this connection, the following simple and powerful principle is extremely attractive:

ADJUNCTION
$\forall p^{\langle \rangle} \forall X^{\langle t \rangle} : (p \text{ entails}^{\langle \langle \rangle, \langle \rangle \rangle} \forall x^t X^{\langle t \rangle} x) \leftrightarrow (\lambda x(p) \text{ entails}^{\langle \langle t \rangle, \langle t \rangle \rangle} X)$

This principle pins down the meaning of the quantifier up to mutual entailments in terms of entailment relations between properties – no small feat – and it has other theoretical attractions too. Yet combined with other plausible principles governing entailment relations among predications, it allows us to argue that my being something is entailed by the logical truth that everything is something ($\forall x \exists y (y = x)$ entails $\exists y (y = a)$). Here is not the place to go into the details of the argument.[21] I merely want to mention the argument as an example of a certain kind of non-modal argument for necessitism. For on either of the two candidate notions of entailment $\leq$ and $\leq'$, that I am a necessary being follows from the above entailment given completely uncontroversial principles of (the *de dicto* fragment of) quantified modal logic (together with what should be an uncontroversial instance of Leibniz's law for $\approx^{\langle \langle \rangle, \langle \rangle \rangle}$). Modal logic *per se* isn't where the action is here. Grain science is.

This last point is relevant to Sider (forthcoming), who defends contingentism by claiming that the sort of abducive criteria Williamson advocates are inappropriate for theorizing about metaphysical necessity because that notion

is metaphysically second-rate. While I disagree with Sider about the place of abduction in modal metaphysics, I also think we can sidestep that issue, since abductive criteria are absolutely relevant for investigating the general principles that we can formulate in pure higher-order logic. Surprisingly, some attractive such principles may by themselves lead us right to necessitism's doorstep.

Notes

1. All page references are to Williamson (2013).
2. See Sider (2011) and Dorr and Hawthorne (2013) for discussion. It is also not entirely clear how to formulate the relevant supervenience theses in a higher-order setting. If we assume that necessarily equivalent propositions are identical (as Williamson does), then there is only one necessary proposition, and so necessity can be defined in purely logical higher-order terms as being a tautology (e.g. $\lambda p(\forall O(Op \leftrightarrow O(p \rightarrow p)))$). And normally, when we formalize the claim that a property (strongly) supervenes on a set of properties and relations, we really mean that it supervenes on the set of properties and relations obtained by closing the original set under certain logical operations. (Sometimes such theses are instead formulated in terms of isomorphisms between possible worlds, but as Williamson points out only necessitists can take such formulations at face value.) In the present higher-order setting, this would then have the effect of making necessity part of every supervenience base, in which case the modal will trivially supervene on the non-modal.
3. See Fine (1977b) and Fritz and Goodman (forthcoming-b) for an exploration of such views in the setting of higher-order modal logic.
4. Consideration of modal truths specified in counterfactual terms, rather than merely in terms of what is necessary or possible, also suggests a way of formulating the ground-theoretic objection in a non-hyperintensional setting, since such truths are not invariably non-contingent.
5. This principle is a consequence of (the modal analogue of) the tensed mereology developed in Hovda (2013); for related ideas, see Hawthorne (2006). Fine (1999) also seems to be committed to such a principle, although since he also takes the relevant notion of parthood to be anti-symmetric, he thereby flirts with paradox; see Goodman (xxx-b) for discussion, where I explore a slightly weakened (but for present purposes strong enough) principle restricted to properties X that, necessarily, have extensions not too big to form a set.
6. An object-language argument for this conclusion would be quite involved, but one can give a relatively straightforward model-theoretic argument relative to the class of structures discussed in Fritz and Goodman (forthcoming-b).
7. See Goodman (xxx-a) and Fritz and Goodman (Forthcoming) for discussion.
8. Of course, those who, unlike Williamson, accept hyperintensional theories of properties might claim that, although it could turn out to be true 'by accident' that necessarily everything necessarily has a haecceity in Williamson's sense, purely modal-metaphysical considerations establish that there could not be the property of being *me* without there being such a thing as me.
9. The second language also contains polyadic generalizations of plural quantifiers, which we might think of as plurally quantifying over ordered n-tuples of individuals; I will ignore this subtlety in what follows. Williamson also interprets

the plural variables in such a way that they can have empty extension – i.e. there are some things (the 'empty plurality') of which nothing is one.

In addition to Boolean connectives and necessity and possibility operators, both languages also include two operators $\downarrow$ and $\uparrow$ which can be seen as generalizing the more familiar rigidifying 'actually' operator: $\downarrow$ has the effect of making the subformula it embeds to be evaluated at the modal scope of any $\uparrow$ binding it, where an occurrence of $\uparrow$ *binds* an occurrence of $\downarrow$ just in case the latter is in the scope of the former and no occurrence of $\uparrow$ has intermediate scope.

10. For purposes of illustration, we might take chunkiness to be being grounded in the concrete and chunkiness* to be instantiating some fundamental property or standing in some fundamental relation, on the assumption that these are distinct properties.
11. Williamson mentions making special provision for sets, but if what he has in mind is something like the proposal in Fine (1977a), it would solve the problem for the 'is a member of' predicate but not for the 'is the favorite set of' predicate. Williamson also justifies the focus on chunky-style necessitsm by saying:

> [I]t is in the spirit of the preferred form of necessitism explained in Chapter 1 to characterize non-chunky things mainly in modal or temporal terms, through the properties they would or could have if they were chunky, or did have when they were chunky, or will have when they are chunky. Such necessitists may be happy to confine their primitive non-logical predicates to those meeting the constraint [of being chunkiness-entailing]. […] Thus we envisage a necessitist who asserts [the relevant chunkiness-entailment principle] for every primitive non-logical predicate in the language. (326,327).

In reply, the 'favorite set' example shows that, although it may be natural for necessitists to characterize non-chunky objects '*mainly* in modal or temporal terms', they are not likely to characterize them *only* in such terms, which is what matters in the present context.

12. The interpretation of chunkiness as contingent non-concreteness has the advantage of making the chunky-style necessitist's claim that everything is possibly chunky uncontroversial, since for any condition *F* it is uncontroversial (assuming S5) that necessarily everything is possibly not contingently not *F*. The issue is then whether, so understood, the realm of the chunky does in fact constitute 'neutral ground' in Kit and Bob's metaphysical dispute.
13. One might think that, when formulated in supervenience-theoretic terms, the floating-free argument for contingentism can be seen as a version of CSC with chunkiness interpreted as instantiating some fundamental property or standing in some fundamental relation. But this is not so, since the floating-free objection so construed would then not apply to the conjunction of necessitism with the claim that identity is a fundamental relation, a view to which the objection clearly does apply when construed in terms of supervenience.
14. In particular, they discuss ways of adding a 'qualitative' operator to modify their schema Comp_{FS} so as to formalize the Fine-inspired view they call the 'qualitative generation view.'
15. Of particular relevance are the main result of Fritz (Forthcoming) and the connection Fritz (2013) establishes between such results and the existence of neutral equivalents given CSN, although the latter paper only considers first-order languages.

16. Briefly, here is why. Let $\ulcorner \Pi x^t A \urcorner$ abbreviate the formula $\ulcorner \exists p\, p \wedge \lambda x(p) =^{\langle\langle t\rangle,\langle t\rangle\rangle} \lambda x(p \wedge A) \urcorner$. One feature of the relevant class of models is that, at each world of every model, the proposition true at only that world is in the $\langle\rangle$-domain of that world. And relative to an assignment of this 'world proposition' to p, $\ulcorner p \wedge \lambda x(p) =^{\langle\langle t\rangle,\langle t\rangle\rangle} \lambda x(p \wedge A) \urcorner$ is true at the world of evaluation just in case $\ulcorner \lambda x(A) \urcorner$ has universal extension at that world – not merely in the sense of being satisfied by everything in the t-domain of that world, or even the t-domain of some world, but rather that it be satisfied by any type-t intension definable in the model, even 'impossible' ones in the t-domain of no world. It is this feature that lets Π behave like a 'classical' quantifier, in the sense that the Π-analogue of the unrestricted comprehension schema comes out valid. This in turn allows us to use Π-quantification of variables of type $\langle e\rangle$ to simulate necessitists' plural quantification in a reasonably mechanical way.
17. To say that the quantifiers are not interpreted as 'unrestricted' is *not* to say that they receive a restricted interpretation; see Dorr (2005, 2008).
18. For the relevant notion of a generalized quantifier, (see Westerståhl 2011).
19. See Fritz and Goodman (forthcoming-b, [Section 3.4]) for an explanation of how to make this notion precise.
20. My own idiosyncratic views about granularity make $\leq'$ but not $\leq$ behave in an entailment-like way, but that is a long story.
21. The argument is inspired by Dorr (2014); I develop it in Goodman (2016) [Chapter 5].

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