Being a thing: An analysis of necessitist metaphysics in first-order quantified modal logic

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ABSTRACT

Timothy Williamson, a necessitist, argues that ‘necessarily everything is necessarily something’. However his claim is ambiguous regarding the kind of modal structure it endorses, with each structural candidate resulting in distinct metaphysical stakes. In this piece I outline each of the structural candidates and analyse them —both logically and metaphysically— within and against Kripkean first-order free logic. I show that the problems Williamson raises with contingentist logic similarly cause problems inside necessitist models. I conclude with a surprising suggestion: a modal logic that treats variables as individual-world pairs, along with a radical form of necessitism that treats quantification as metaphysically primitive.

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Introduction and a word on method

'Things could have been otherwise. It is contingent how they are. Although the coin came up heads, it could have come up tails. Is it also contingent what things there are? 'Yes' seems the obvious answer. The universe could have evolved differently, so that there was never any money, or even any non-pecuniary physical object shaped like this coin. In those circumstances, not only would this coin not have been a coin, it would not have been anything at all; it simply would not have been… Or so it seems.'

Timothy Williamson.[1]

In this quote, Timothy Williamson directs our attention toward the intuitive metaphysical notion that both the quality *and* quantity of things is contingent. This is the metaphysical position known as 'contingentism'. Williamson describes contingentism in order to contrast it with his own position of 'necessitism'. Necessitism, as Williamson understands it, holds that although the quality of things could have been otherwise, the quantity of things is necessarily fixed. The necessitist argues that even if the coin were never minted it would still be something; although not the coin that it is in actuality. Williamson summarises necessitism with the pithy claim that 'necessarily everything is necessarily something'.[2] Necessitism rules out two possibilities: that there could have been something that is actually nothing, and that there is actually something that could have been nothing. Williamson's book *Modal Logic as Metaphysics* [MLAM] explains and defends the necessitist claim against the position of contingentism, and will be the subject of this analysis.[3]

[1] Williamson, 2013, p. 1.
[2] Ibid. p. 2.
[3] His defence of necessitism also involves a simultaneous defence of its temporal analogue: permanentism. Permanentism states that 'always everything is always something'. Williamson treats the necessitism debate as the central one, and, for the sake of simplicity, I shall focus on it exclusively.

When outlined as above, the necessitist position seems obviously false. How then could necessitism be a justifiable metaphysical position? A first guess might be that it is a claim based on a scientific commitment to the existence of fundamental particles that, although possible to be arranged differently, could have been neither more nor less in number due to their fundamental nature. The necessitist could continue to argue that although we might refer to coins as 'things' this is only loose talk of groups of fundamental particles arranged into particular structures, and only the fundamental particles themselves are really quantifiable.[4] This guess would be wrong. Necessitism *does* count complex objects as 'things' and really *is* committed to saying that everything is necessarily something. The *actual* justification given for necessitism is not scientific but logical. The claim is that necessitism is the natural metaphysical reading of an elegant quantified modal logic; it may perhaps be possible to force the logic to allow for a contingentist reading, but only by complicating it in ad hoc ways. Such a manoeuvre, claims Williamson, would be as misguided in metaphysics as it would be in the natural sciences:

> *'classical modal or temporal logic is a strong, simple, and elegant theory. To weaken, complicate, and uglify it without overwhelming reason to do so in order to block the derivation of the necessity or permanence of identity would be as retrograde and wrong-headed a step in logic and metaphysics as natural scientists would consider a comparable sacrifice of those virtues in a physical theory'.*[5]

As his book title suggests, Williamson uses quantified modal logic as the theory behind metaphysics, and wants it to inform our metaphysics even if it produces results

[4] This defence of necessitism is discussed and rejected in Williamson, 2013, pp. 5-6.
[5] Ibid. p. 27.

unexpected by our intuitions: 'one role for logic is to supply a central structural core to scientific theories, including metaphysical theories, in essence no more above dispute than any other part of those theories'.[6] His claim is that although logical structure itself is contentious, once a particular structure has demonstrated its superiority, judged by typical scientific standards of strength and elegance, its metaphysical claims ought to be taken seriously.[7] By way of comparison it could be argued that just as the most elegant theory of macrophysics tells us that time is not constant —despite our intuitions to the contrary— the most elegant theory of metaphysics tells us that things are necessarily things —despite our intuitions to the contrary. Of course that leaves us with some major metaphysical questions, but Williamson thinks that addressing these is the appropriate course of action rather than tinkering with the logical theory.

Williamson's position is not typical. Many philosophers, such as Saul Kripke and James Garson, have attempted to accommodate contingentism within logic, since they regard contingentism to be an obvious truth of metaphysics.[8] The need for them to adjust the logic is due to the fact that a simple combination of modal logic and quantified logic, taking the sum total of the axioms and rules of transformation for each, leads to *classical quantified modal logic* that has a natural necessitist interpretation when read metaphysically. Added to this is the fact that the first system of quantified modal logic to be axiomatised introduced a specific quantified modal

[6] Williamson, 2013, p. x.
[7] Williamson establishes the connection between 'truth in a model' and 'metaphysical truth' by means of a Boolean algebra that equates each possible world with a maximally descriptive proposition. He then argues for an S_5 modal structure, and seeks general formulae that are 'metaphysically universal' —true for all predicates or propositions— in that model (see Williamson, 2013, pp. 92-118). I shall not be analysing the legitimacy of this approach. For some criticisms of this method see Sullivan, 2014, pp. 734-743; Bricker, 2014, pp. 717-725; and Divers, 2014, pp. 726-733. Williamson's reply to these criticisms can be found in Williamson, 2014, pp. 744-764.
[8] Kripke, 1963, pp. 84-94; Garson, 2005, pp. 621-629; Garson, 1984, pp. 249-307.

axiom —the *Barcan Formula*, named after its creator Ruth Barcan— that caused controversy when it was realised that it leads, when read metaphysically, to necessitism.[9] Contingentist philosophers view the necessitist conclusions of the logic as a defect, and work to 'correct the error' by removing the Barcan Formula axiom along with the structural aspect of the logic that lead to its validity; the result is known as *free logic*. Through this they attempt to create a quantified modal logic free from metaphysical assumptions such as the necessary existence of all things. Removing these elements from the system leads to adjustments to some of the fundamental principles of modal logic and quantified logic, typically in the form of added complexity. It is as a result of this that Williamson advocates a simple, powerful logic coupled with necessitist metaphysics, in line with what he perceives as good scientific practice.[10]

It should be noted at this early stage that Williamson thinks that 'higher-order modal logic provides the best setting in which to resolve the issue between contingentism and necessitism'.[11] However he dedicates the first half of his large work to examining the opposing views in first-order logic, concluding with the claim that 'although none of this amounts to a refutation of contingentism, it is evidence that the view goes against the logical grain'.[12] I shall limit my analysis herein to the first-order considerations Williamson raises, and leave his higher-order arguments for the interested reader.[13] Williamson's specific line of argument for necessitism in first-order quantified modal logic is as follows. He begins by describing a novel necessitist metaphysics that is not immediately objectionable in order to demonstrate that the

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[9] Barcan, 1946, pp. 1-16.
[10] Williamson, 2013, pp. 423-429.
[11] Ibid. p. xiii.
[12] Ibid. p. 188.
[13] See Williamson, 2013, chapters 5, 6, and 7, for his higher-order argument in necessitism's favour.

falsity of necessitism cannot be settled within metaphysics alone, it requires logical analysis: 'On these clarifications of what necessitism and permanentism imply, and what they do not, neither is obviously false… We can properly evaluate them only by theoretical enquiry'.[14] After that he demonstrates that necessitist metaphysics allows us to maintain theorems from modal and quantified logic without adjustment, and argues that the logical tinkering required to allow for contingentist metaphysical intuitions results in complexity and weakness: 'Since both simplicity and strength are virtues in a theory, judged by normal scientific standards, these restrictions in contingentist logic should give one pause'.[15] Later he introduces what he calls the 'being constraint', a metaphysical principle that states that when we predicate, we must apply that predicate to *something*, i.e. that *nothing* cannot bear predicates. The being constraint comes in two flavours: one claims that predicating positively, e.g. *x* is *F*, requires something to predicate of, and the other claims that predicating negatively, e.g. *x* is not *F*, requires something to *not* predicate of. In light of the effect the being constraint has on free logic Williamson claims that:

> *'Contingentists are in a tricky position. If they insist that it is possible to fall under a predicate and yet be nothing, they face the charge that they are unserious about their own contingentism… If they agree that falling under a predicate entails being something, they slide into necessitism unless they distinguish not falling under a predicate from falling under a negative predicate… If they introduce the… [distinction], they still slide into necessitism unless they complicate its logic in awkward ways'.*[16]

He concludes that for various reasons contingentists cannot win, whether or not they accept one or both flavours of the constraint. Williamson also gives natural language

[14] Williamson, 2013, p. 9.
[15] Ibid. p. 43.
[16] Ibid. p. 188.

examples that make it difficult for contingentists to maintain the being constraint within a contingentist logic *even with* the added complexity that comes with distinguishing two variant types of negative predication. His argument is that there are times when claiming that (simple) predicates can apply to things the contingentist would regard as nothing is almost unavoidable, and thus results in necessitism.[17]

I think it helpful for the sake of clarifying my intended method of analysis to admit to a reservation I have regarding Williamson's method of argument. My reservation with his method is that the semantics of the quantifiers is different under a contingentist metaphysical reading than it is under a necessitist metaphysical reading. They each quantify over, and thus talk about, different 'things'. 'Something' for a necessitist is not 'something' for a contingentist —it is 'nothing'— despite Williamson's appeal to a commonly understood unrestricted reading acceptable to both parties.[18] By equating the two 'somethings' from the start, the metaphysical reading gets lost in the technical discussion of the logic, and the merits are weighed only on their logical elegance; differences of metaphysical translation being ignored. Although necessitist metaphysics coupled with classical logical structure might preserve the separate axioms of modal and quantified logic, it does so in letter only, not in spirit, since the novel metaphysics necessitism requires alters the way they metaphysically translate, i.e. the semantics is changed by the metaphysics. This makes direct comparison in the logic a skewed affair. After all, MLAM is not *meant* to be a straight comparison of logical structures, but a comparison of two metaphysical positions *when analysed in logic*. Thus the metaphysics must also be read *into* the logic as a metaphysical model,

[17] Ibid. pp. 148-150.
[18] Ibid. pp. 14-18.

not simply *from* it as a metaphysical theory. This is a concern shared with Max Cresswell, who, in his book review of MLAM, writes:

> *'Williamson argues that the dispute between necessitists and contingentists is a genuine dispute in which both parties mean the same by their sentences, but simply disagree about truth values… but one thing the dispute is* not *is a dispute about the truth of principles… for an agreed meaning of these formulae'.*[19]

Cresswell shows that there are two kinds of logical structure that could be used to model necessitist metaphysics. Both validate, in their own way, the formula that says 'necessarily everything is necessarily something' but the way in which the models validate that formula is different. One model results in the formula being validated when restricted to things located at the world of reference, i.e. 'necessarily everything is necessarily something' is true regarding 'everything' at the world of utterance, most interestingly in the case of our *actual world* —I label this model fixed-necessitism. This model differs from contingentism in terms of its metaphysical stakes. The other model results in the formula being validated when considered across all worlds collectively, i.e. 'necessarily everything is necessarily something' is true regarding 'everything' at the world of utterance and all other worlds, and 'something' at the world of utterance or some other world —I label this model union-necessitism.[20] In this second setting the positions can, in principle, ontologically agree; the debate here revolves around the technical need to quantify over that to which we apply predicates, a principle known as 'the being constraint'. In addition to the models Cresswell puts forward there is a third model that validates the necessitist formula. This model validates it in a trivial way by treating 'thingness' as a primitive, non-modal concept,

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[19] Cresswell, 2014, p. 337.
[20] Ibid. pp. 333-335.

i.e. 'necessarily everything is necessarily something' is logically equivalent to 'everything is something'. The metaphysical stakes in this model are substantial, although different in kind to those in the models above since they centre on matters of primitivity rather than ontology —I label this model trans-necessitism. In each of the models the modal scope, and thus the semantic interpretation, of the quantifiers is vastly different. Williamson is aware of at least that first two distinct necessitist models, but treats each as equally favourable for his cause since he states that he is concerned only with quantifiers taken 'unrestrictedly' over what there is, and so does little to distinguish them either structurally or metaphysically throughout his argument.[21] His *metaphysics* is equally vague regarding which variant of necessitist model it represents, and at times might even be thought to equivocate between them to his advantage. Suffice it to say that this approach is hardly conducive to clarity, and results in Cresswell claiming that 'there seems to me a danger that he risks losing precisely the audience who most desperately need the book'.[22]

In this analysis I will seek to clarify the arguments in order to establish what, if anything, is *metaphysically* at stake in the debate, and then to compare the merits of each model in terms of their strength and elegance. To do so, each of the models — fixed-necessitism, union-necessitism, and trans-necessitism— will be analysed on their own metaphysical terms, and I will focus on the nature of the relationship between quantifiers and predicates in each model. The first area of analysis regards the ground of 'thingness': what is it that makes a thing, a thing? Grounding concerns relate to the intuition we have regarding the derived nature of quantification based on predicates: x is a thing only if x is A. Grounding principles help us understand what is

[21] Williamson, 2013, pp. 14-18, p. 129.
[22] Cresswell, 2014, p. 337.

at stake in the positing of a thing. If *x* is a thing, then we can say that *x* must be, at the very least, *A*. The second area of analysis is the being constraint. The being constraint relates to the converse intuition we have that predicates must apply to quantifiable things: *x* is a thing if *x* is *A*. Taken together they could result in the equivalence that *x* is a thing if and only if *x* is *A*, but this requires ‘grounding *A*’ to be the same as ‘being constraint *A*’; or ‘the range of grounding *A*’s’ to be the same as ‘the range of being constraint *A*’s’. If quantification is tied with predication this way, then the debate between the positions reduces to questions regarding the content of the set of predicates *A* that both derive from and constitute thingness. Certain predicates become central to this debate such as predicates that govern modes of being, particularly ‘being abstract’ and ‘being concrete’, as well as the predicate of ‘existence’. Williamson argues for necessary thingness based on a broad concept of predicates that include such predicates as self-identity and the ability to be named or referred to, while contingentists such as Kripke allow certain predicates to apply to ‘nothing’. Against the backdrop of this debate I examine two case studies of predicates that apply to counterfactual individuals, and argue that the only logical structure capable of representing these predicates requires a primitive non-modal domain of individuals, coupled with an assignment function that assigns both individuals *and* worlds to free variables, rather than relying on a world of evaluation. This model has a natural trans-necessitist metaphysical reading, thus I endorse trans-necessitism on that basis.

Modal logic

'Modal logic is the logic of necessity and possibility, of 'must be' and 'may be'. By this is meant that it considers not only truth and falsity applied to what is or is not so as things actually stand, but considers what would be so if things were different.'

George Hughes and Max Cresswell.[23]

Propositional calculus [PC] is the logic of propositions: claims about how things are. Formulae consist of propositional variables (p, q, r, … etc.), logical connectives ($\wedge$, $\vee$, $\supset$, … etc.), negation (~), equivalence (≡), and brackets, evaluated for validity by truth tables or similar. A formula that *can* be true given a particular assignment of values to the variables is invalid but possibly true; a formula that *is always* true regardless of the assignment of values given to the variables is valid or necessarily true; a formula that *cannot* be true regardless of the assignment of values given to the variables is a contradiction or necessarily false. Modal logic seeks to take the concept of possibility and necessity and build it into PC by introducing new symbols and rules for the modal operators of necessity $\Box$ and possibility $\Diamond$. Either operator may be taken as primitive since they can be defined in terms of each other: $\Box \equiv {\sim}\Diamond{\sim}$ and $\Diamond \equiv {\sim}\Box{\sim}$. A single assignment of values to the variables does not typically fully determine the truth or falsity of formulae that contain modal operators, e.g. the truth or falsity of $\Box p$ is not determinable by assigning to p the value 1. Instead modal formulae represent claims regarding sets of different states of affairs. If α is a formula then $\Box\alpha$ is true if and only if α is true on *all* allowable assignments to the propositional variables. Now, the word 'necessity' can be used for different kinds of claims in English, and similarly $\Box$ can be read as making different claims within logic. The philosopher Rudolph Carnap

[23] Hughes and Cresswell, 1996, p. ix

treated □ as a symbol of logical certainty, and ◇ as a symbol of logical consistency.[24] As such he considered $\Box\alpha$ true if and only if α was true on every consistent assignment of values to the propositional variables —i.e. PC validity— and $\Diamond\alpha$ true if and only if α was true on some consistent assignment of values to the propositional variables —i.e. PC non-contradictory.[25] But the symbols need not be interpreted that way.

A major development in modal logic came later when Saul Kripke recast modality in terms of truth in a particular *model*. Informally, a Kripke model consists of a set of states of affairs —or 'worlds'— at which propositional variables are assigned values and formulae evaluated, coupled with a relationship *between* those worlds that governs the way modality is evaluated. The idea is that a formula $\Box\alpha$ is true at a given world if and only if α is true at *all worlds* that it is related to, and $\Diamond\alpha$ is true at a given world if and only if α is true at *some world* that it is related to. Formulae without modal operators are evaluated just like they are in PC according to the assigned values of the propositional variables at that world. *Validity* on a model is being true at all worlds in that model. Formally, Kripke defines a model as an ordered triple <W, R, V>, where W is a non-empty set of worlds, R is a dyadic relationship defined over the set W, and V is an assignment of values to propositional variables and formulae at each world that obeys the logical rules. If W is the non-empty set of worlds $\{w_1, w_2, w_3, \ldots\}$, then R is a set of ordered pairs over W, i.e. $R \subseteq W^2$. For any pair of worlds, not necessarily distinct, we write w_1Rw_2 if and only if $<w_1, w_2> \in R$. V maps each formula at each world to either 0 or 1. We write $V(\alpha, w) = 1$ if and only if

[24] Here, as elsewhere, we standardise the logical symbols to the ones we are using for the sake of clarity. Carnap used *N* rather than □ as his necessity operator, see Carnap 1946 and Carnap 1947.
[25] Williamson, 2013, pp. 46-60.

α is true at w and V(α, w) = 0 otherwise. The assignment of values follows from the assignment given to the propositions, judged according to the implications of PC and the modal operators as interpreted by R, e.g. V(~α, w) = 1 if and only if V(α, w) = 0, and V(□α, w) = 1 if and only if for each w* such that wRw* V(α, w*) = 1. The other rules that V obeys are the natural ones that follow the meanings of the logical connectives.[26] In addition to Kripke *models*, modal logic makes use of Kripke *frames* (hereafter simply models and frames) that are like models except they lack the assignment of values. They are simply an ordered pair <W, R> defined as they are in models. Frames allow formulae to be evaluated in more general terms, as being either valid or invalid on a frame regardless of V. Alongside the model conception of modal logic, Kripke maintains a classical axiomatic definition. Much work has been done analysing certain axiomatic systems of modal logic, and sets of frames upon which those theorems are valid. Formulae that can be derived from the axiomatic basis and rules of derivation are *theorems*, whilst formulae true at every world in a frame, regardless of V, are *valid* on that frame. A system of modal logic is considered *sound* if there exists a class of frames upon which all theorems of the axiomatic system are valid, and a system of modal logic is considered *complete* if there exists a class of frames in which all valid formulae on those frames are theorems of the axiomatic system.[27] There are axiomatic systems that are neither sound nor complete on any set of frames, although 'normal' modal systems can be demonstrated sound and complete with respect to a given class of frames; a highly desirable trait.

Kripke's recasting enabled modal logic to be applied to different kinds of necessity and possibility. For instance, one system of modal logic, deontic logic, regards □ as

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[26] Hughes and Cresswell, 1996, pp. 38-39.
[27] Ibid. pp. 36-37.

describing moral obligation, and $\Diamond$ as describing moral permissibility. By assuming that what is morally obligatory must be morally permissible, the deontic system takes $\Box p \supset \Diamond p$ as an axiom and analyses the kind of frames that validate formulae of that axiomatic system.[28] But despite the range of possible applications, Kripke's system lends itself naturally to a metaphysical reading, especially with the use of the term 'worlds' as the points of evaluation. Thus Kripkean logic becomes a highly useful semantic for evaluating metaphysical claims. I will briefly outline below some normal systems that will prove useful.

Modal system K

Axioms:

The complete set of valid PC formulae and

K $\Box(p \supset q) \supset (\Box p \supset \Box q)$.

Frames:

All frames validate the **K** axiom.

Transformation rules:

Universal substitution [US]: If α is a theorem then any uniform substitution of any or all propositional variables with alternate formulae is a theorem. We write this as $\alpha[\beta/p, \chi/q, \ldots]$ where each occurrence of p in α is replaced with formula β and so on.

Modus ponens [MP]: If α is a theorem, and $\alpha \supset \beta$ is a theorem, then β is a theorem.

The rule of necessitation [N]: If α is a theorem then $\Box\alpha$ is a theorem. Necessitation preserves validity on all frames/models since for α to be a

[28] Ibid. pp. 43-45.

theorem it must be true at all worlds on all frames in the set. Therefore it must also be necessarily true at all worlds in all frames in the set regardless of R.[29]

Other normal systems

Some other modal systems of particular interest to metaphysics add some or all of the following axioms to those of system K:

T $\Box p \supset p$

The KT system is sound and complete with respect to all frames in which R is reflexive, i.e. for all frames in which wRw for every world w. The T axiom is typically accepted as metaphysically valid.[30]

4 $\Box p \supset \Box\Box p$

Adding the **4** axiom to the system T produces the system S_4. S_4 is sound and complete with respect to all frames that are reflexive and transitive, i.e. in addition to reflexivity, if w_1Rw_2 and w_2Rw_3 then we must also have w_1Rw_3. Again S_4 has few doubters in terms of metaphysical application.[31]

B $p \supset \Box\Diamond p$

Adding **B** to T produces the system B (also called KTB). Adding it to S_4 produces the system S_5 outlined below. The B system is sound and complete with respect to all frames that are reflexive and symmetric, i.e. in addition to reflexivity, if w_1Rw_2 then we must also have w_2Rw_1. **B** is perhaps a little more controversial, although it commands metaphysical plausibility. It claims that what is actually the case is necessarily possible. In other words if things were otherwise, then the way things are

[29] Ibid. pp. 24-26.
[30] Ibid. pp. 41-43.
[31] Ibid. pp. 53-54.

in actuality would be possible. This would be invalid only if it were metaphysically possible for actuality to be impossible.[32]

E $\Diamond p \supset \Box\Diamond p$

E can be added on its own to T to produce S_5, since with it both **4** and **B** can be derived. S_5 is sound and complete with respect to all frames that are reflexive, transitive and symmetric, i.e. R relates every world to every other world.[33] It is called an equivalence relation. As a particularly strong system, S_5 is the most metaphysically controversial. However it also commands strong metaphysical plausibility. If a certain state of affairs is metaphysically possible then it seems reasonable that it would remain possible even if things had been otherwise.[34] Also, if both **4** and **B** are accepted then **E** can be derived from those two axioms.

[32] Ibid. pp. 62-63.

[33] It is possible for an S_5 system to consist of groups of completely disconnected worlds, each group consisting of worlds fully related to all other worlds in that group. But in such cases each disconnected group can be thought of as its own S_5 model. No loss of generality results from assuming an equivalence relation for S_5 systems.

[34] Hughes and Cresswell, 1996, pp. 58-59.

Lower predicate calculus

'In essence the predicate calculus extends the propositional calculus by the addition of symbols which enable us to speak about 'all' or 'some' things which satisfy a certain condition. These symbols are called quantifiers.' George Hughes and Max Cresswell.[35]

Lower predicate calculus [LPC] extends PC by adding to it a set of individual variables (*x*, *y*, *z*, … etc.), a set of *n*-place predicates (*A*, *B*, *C*, … etc.), quantifiers (∀ and ∃), and a special logical 2-place predicate of identity (=).[36] $\forall x$ quantifies over 'every *x*', while $\exists x$ quantifies over 'some *x*'. Either quantifier may be taken as primitive since they can be defined in terms of each other: $\forall x\ \alpha \equiv {\sim}\exists x\ {\sim}\alpha$ and $\exists x\ \alpha \equiv {\sim}\forall x\ {\sim}\alpha$. I shall also make use of a set of individual constants (*a*, *b*, *c*, … etc.), since Williamson makes use of them in his models. These individual constants are equivalent to proper names of individuals and thus form a 'rigid' relationship with the domain of quantification.[37] The domain and individual constants, although required to each form a set, need not be restricted to countable infinity, unlike the set of variables and predicates which can be countably infinite at most. With the above extension to the language, a model of LPC interprets formulae over an ordered pair <D, V>. D is the domain of individuals, the 'things' quantified over $\{a_1, a_2, a_3, \dots \text{etc.}\}$. V is a function that maps a set of *n*-tuples of individuals to each *n*-place predicate, as well as each individual constant to a member of the domain. We say that $Aa_1a_2...a_n = 1$ if and only if $<a_1, a_2, \dots , a_n> \in \mathrm{V}(A)$ otherwise $Aa_1a_2...a_n = 0$; and that, for example, $\mathrm{V}(a) =$ this coin, a_1. For all closed formulae V assigns truth-values in the natural way, e.g.

[35] Ibid. p. 235.
[36] Ibid. pp. 235-236, pp. 312-314.
[37] It is possible for more than one name to refer to the same individual, so the relationship need not be one-to-one, e.g. 'Paul Hewson' and 'Bono' might refer to the same individual. Also, the 'rigid' nature of the relationship comes into play only once the logic becomes modal e.g. if 'Solomon' names the child of David and Bathsheba then it does so necessarily.

$V(\forall x\, Ax) = 1$ if and only if $<a_i> \in V(A)$ for every individual a_i otherwise $V(\forall x Ax) = 0$, $V(\exists x \exists y\, Axy) = 1$ if and only if $<a_i, a_j> \in V(A)$ for some individual a_i and some individual a_j otherwise $V(\exists x \exists y\, Axy) = 0$. In the special case of the predicate of identity we have $V(=) = \{<a_1, a_1>, <a_2, a_2>, <a_3, a_3>, \ldots \text{etc.}\}$. Whereas other 2-place predicates are written as Axy, the identity predicate is written as $x = y$.

Since V is a function mapping sets of ordered *n*-tuples of *individuals* to predicates, it cannot directly assign a truth-value to open formulae. This requires the addition of an assignment ϕ that uniformly assigns each free variable to an individual in the domain. Thus for open formulae truth-values are dependent on a particular assignment. Under such an assignment, V assigns truth-values in the natural way, e.g. $V_\phi(\alpha) = 1$ if and only if α is true given the assignment ϕ of individuals to the free variables otherwise $V_\phi(\alpha) = 0$, and $V_\phi(\forall x\, \alpha) = 1$ if and only if α is true given the assignment ϕ of individuals to the free variables while treating the closed variables in the same way as above.[38] A standard axiomatisation, along with some metaphysical justification follows.

A standard axiomatisation of LPC[39]

Axioms:

The complete set of valid PC formulae,

Any LPC substitution instance of a valid PC formula, and

∀1 (UI): $\forall x\, \alpha \supset \alpha[y/x]$, where y can be a variable or a constant. The notation is the same as for [US] but comes with some conditions: first y can only

[38] Hughes and Cresswell, 1996, pp. 235-241.
[39] Taken largely from ibid. pp. 241-243.

replace any *free* occurrence of x in α, second, it must not be the case that, if y is a *variable*, it becomes *bound* after the substitution.

Transformation rules:

Modus ponens [MP]: If α is a theorem, and $\alpha \supset \beta$ is a theorem, then β is a theorem.

∀2: If $\alpha \supset \beta$ is a theorem then $\alpha \supset \forall x\, \beta$ is a theorem, as long as x is not free in α.

Some derived transformation rules:[40]

∃1 (EG): $\alpha[y/x] \supset \exists x\, \alpha$

∃2: If $\alpha \supset \beta$ is a theorem then $\exists x\, \alpha \supset \beta$ is a theorem, as long as x is not free in β.

Metaphysically, **∀1** (**UI**) claims that if *all* possible x-assigned individuals satisfy α, then *any* possible x-assigned individual must satisfy α. Metaphysically, **∃1** (**EG**) claims that if *some* x-assigned individual satisfies α, then there must be *something* that satisfies α.[41] **UI** stands for 'universal instantiation' and **EG** stands for 'existential generalisation', and I will tend to refer to the theorems by these names. Note that special cases of **∀1** and **∃1** are where y is simply x. In these cases you get $\forall x\, \alpha \supset \alpha$ and $\alpha \supset \exists x\, \alpha$. These two theorems play a major part in the forthcoming discussion. The metaphysical reasoning behind **∀2** is that if one case logically implies a second case, and the first case is a general claim regarding some or all individuals, then it must be true or false *simpliciter,* and so if it implies a second case regarding any particular assigned individual it must imply it regarding all individuals.

[40] Due to the equivalence of $\exists x$ and $\sim\forall x\sim$.

[41] The cases of **∀1 (UI)** and **∃1 (EG)** in which x does not appear free in α are vacuous, and so require no metaphysical justification or translation.

Finally there is the special predicate of identity. The rules for which are as follows:

I1: $x = x$, whether x is a variable or a constant.

I2: $x = y \supset (\alpha \supset \beta)$, where x and y may be variables or constants, so long as α and β differ, if at all, *only* in that α has free x in some places where β has free y.

Metaphysically, the rules of the identity predicate represent the claim that every x is self-identical, and that identical things can be freely substituted for each other.

Deriving necessitism in classical QML

'The restrictions on instantiation (for ∀) and generalization (for ∃) complicate quantificational reasoning, at least in modal contexts, and their intended effect is a loss of logical power. Since both simplicity and strength are virtues in a theory, judged by normal scientific standards, these restrictions in contingentist logic should give one pause.' Timothy Williamson.[42]

Williamson makes the above claim after considering a quantified modal logic that combines the axioms and transformation rules of modal and quantified logic. In 'classical quantified modal logic', modal logic and LPC are combined naturally with no change to the axioms or transformation rules, other than a tweak to the V function in the structure. Models now consist of an ordered quadruple <W, R, D, V>. As before <W, R> forms a frame, and D represents the domain of individuals. V now maps individuals from the domain to each predicate *at each world*. This adjustment to the function V allows for some object to satisfy a predicate at one world, but not another, i.e. it allows for contingent predicates regarding individuals. Formulae of quantified modal logic now have, in any model, a truth-value relative to both an assignment to the individual variables *and* a possible world. In particular the 'truth rule' for ∀ now reads:

> $\forall x\ \alpha$ is true in w with respect to an assignment ϕ if and only if α is true for all assignments γ which are just like ϕ except in the value they assign to x where $\gamma(x)$ is in D.[43]

It is 'classical quantified modal logic' that Williamson advocates for its strength and elegance, and argues results in necessitist metaphysics that should be accepted. He

[42] Williamson, 2013, p. 43.
[43] Hughes and Cresswell, 1996, pp. 243-247.

makes three arguments to show that the metaphysical implications of classical QML are necessitist, i.e. he demonstrates three ways in which **NNE** $\Box\forall x\ \Box\exists y\ x = y$, the 'necessary necessity of being' can be derived (or something equivalent).[44] To avoid these derivations he argues that the contingentist must either restrict the modal rule of necessitation, N, or adopt 'free logic' by restricting the quantificational theorems of universal instantiation, **UI**, and existential generalisation, **EG**. It is these restrictions that Williamson objects to, and thinks makes contingentism a weaker, more complex, less scientifically appealing metaphysics to account for in logic.

The argument from proper names[45]

We begin with quantified logic (LPC). Consider any individual within D, the domain of individuals. Let <W, R, D, V> be a model in which this individual has a proper name, say *k*, the designating constant in the set of individual constants. Since this individual is within the domain, we can form the following true statement:

PN: $\exists x\ k = x$.

This metaphysically reads as '*k* is something'. Since V(*k*) maps *k* to some individual within the domain, **PN** must be true in every model for any constant *k*, and is therefore valid. We could derive **PN** axiomatically as follows:

1:	$k = k$	**I1**
2:	$\exists x\ k = x$	**1** x**EG, [MP]**

Therefore **PN** is a theorem of LPC as long as it includes proper names. This proof makes explicit the implicit use of **EG** in the justification of **PN**. If we now consider a *modal* quantified logic, we can apply the rule of necessitation to **PN** to get:

NPN: $\Box\exists x\ k = x$.

[44] Williamson, 2013, p. 38.
[45] Williamson makes the proper name argument in 2013 pp. 40-42.

NPN metaphysically reads as saying that '*k* is necessarily something'. Williamson admits that this is not quite the full necessitist claim, since it only states that anything that *can be named* is necessarily something. It does not therefore stop the counterfactual possibility of something existing that is actually nothing. However Williamson responds by saying that in such counterfactual circumstances we *could* name that object and so **NPN** would say that it *would be* necessarily something; so as long as we accept that what is possibly necessary is the case (derivable from the **B** axiom) it would have to be the case in actuality. Even if a contingentist rejected the **B** axiom of modal logic, **NPN** is necessitist in spirit. **NPN** explicitly claims that every individual thing that is something is something of necessity; it is this half of the necessitist claim that is most objectionable to our metaphysical intuitions. Therefore a contingentist is unlikely to feel comfortable affirming **NPN**.

The argument from the converse Barcan formula[46]

Consider the formula:

CBF: $\Box\forall x\, \alpha \supset \forall x\, \Box\alpha.$

For reasons to be explained in the next section this formula is called the *Converse Barcan Formula*. CBF is easily proved in all normal modal predicate logics as follows:

UI:	$\forall x\, \alpha \supset \alpha$	
1:	$\Box(\forall x\, \alpha \supset \alpha)$	**UI** x**[N]**
2:	$\Box\forall x\, \alpha \supset \Box\alpha$	**1** x**K, [MP]**
CBF:	$\Box\forall x\, \alpha \supset \forall x\, \Box\alpha$	**2** x$\forall$**2**.

[46] Williamson makes this argument in 2013, pp. 37-40.

From the Converse Barcan Formula we can prove necessitism directly by substituting $\exists y\ x = y$ for α, along with the necessitation of the identity principle $\forall y\ \exists x\ y = x$, 'everything is something':

3:	$\Box\forall x\ \exists y\ x = y \supset \forall x\ \Box\exists y\ x = y$	Instance of **CBF**
4:	$\forall x\ \exists y\ x = y$	Identity principle
5:	$\Box\forall x\ \exists y\ x = y$	**4** x**[N]**
6:	$\forall x\ \Box\exists y\ x = y$	**3**, **5** x**[MP]**
NNE:	$\Box\forall x\ \Box\exists y\ x = y$	**6** x**[N]**.

Summarising the proof: the antecedent of **3** metaphysically reads as saying 'necessarily everything is something' and so the antecedent cannot be false by typical metaphysical assumptions, since 'everything is something' is a logical truth, and so a necessary truth. Therefore since the antecedent (**5)** of **3** is a theorem, the consequent (**6**) of **3** cannot be false either, so must be a theorem. Since **6** is a theorem the rule of necessitation says it is necessarily true i.e. **NNE**.

Now, we have reached **NNE** using only the axioms and transformation rules of the modal system K and LPC. So **NNE** is derivable from the weakest modal system when quantified according to the principles of LPC. On a standard metaphysical interpretation of the logic **NNE** says that 'necessarily everything is necessarily something' i.e. it is the claim of necessitism.

The argument from the Barcan formula[47]

The first formal axiomatic system of quantified modal logic by Ruth Barcan contained a single axiom regarding the interaction of the quantified and modal

[47] Williamson makes this argument in 2013, pp. 32-36.

syntax.[48] Although this axiom was originally formulated in terms of strict implication, its material variant, known as the Barcan formula, has become the subject of much debate. The Barcan formula can be considered as the schema:

BF: $\forall x \Box \alpha \supset \Box \forall x\ \alpha$.

It is easy to see that **BF** has **CBF** as its converse, thus explaining the name of the latter formula. Both **BF** and **CBF** are valid according to the semantics being assumed at present.[49] The Barcan formula was originally an *axiom* of Ruth Barcan's system, but it can also be *derived* using the axioms and rules of transformation of the B system of modal logic combined with LPC. Therefore, since S_5 is a stronger system than B, it is also derivable from the S_5 system of modal logic when combined with LPC. This is particularly worthy of note since many, including Williamson, take S_5 to be the appropriate modal structure for metaphysics.

The Barcan formula can be derived as follows:

EG:	$\alpha \supset \exists x\ \alpha$	
1:	$\Diamond \alpha \supset \exists x \Diamond \alpha$	Instance of **EG**
2:	$\Box(\Diamond \alpha \supset \exists x \Diamond \alpha)$	**1** x**[N]**
3:	$\Box \Diamond \alpha \supset \Box \exists x \Diamond \alpha$	**2** x**K**, **[MP]**
B:	$\alpha \supset \Box \Diamond \alpha$	
4:	$\alpha \supset \Box \exists x \Diamond \alpha$	**3**, **B**, x**[PC]**
5:	$\exists x\ \alpha \supset \Box \exists x \Diamond \alpha$	**4** x∃**2**
BF:	$\Diamond \exists x\ \alpha \supset \exists x \Diamond \alpha$	**5** x**[DR]** [50], **[MP]**.[51]

[48] Barcan, 1946.
[49] From **BF** and **CBF** we can derive their equivalents: $\Diamond \exists x\ \alpha \supset \exists x \Diamond \alpha$ and $\exists x \Diamond \alpha \supset \Diamond \exists x\ \alpha$.
[50] [DR] represents the derived rule of B that states if $(\alpha \supset \Box \beta)$ is a theorem then $(\Diamond \alpha \supset \beta)$ is a theorem. For a proof of the converse of this derived rule see Hughes and Cresswell, 1996, p. 62-63. [DR] then follows by the equivalence of $\Diamond$ and $\sim\Box\sim$.

Instead of using the Barcan Formula to derive **NNE**, Williamson uses it to falsify the contingentist claim that 'something is possibly nothing': $\exists x \Diamond{\sim}\exists y\ x = y$. He does this by making use of the symbol @ as a rigidifying operator that stands for 'actually'. When inside the scope of a modal operator, @ evaluates the ensuing formula at the world under consideration.[52] Thus by making the substitution $@ {\sim}\exists y\ x = y$ for α in **BF** he gets the following:

6: $\Diamond\exists x\ @{\sim}\exists y\ x = y \supset \exists x\ \Diamond @{\sim}\exists y\ x = y.$

Now, in the consequent the @ makes the $\Diamond$ redundant as it returns the evaluation to the 'actual' world.[53] Once the @ operator has done its task of making the $\Diamond$ redundant, it too becomes redundant. This reduces **6** to:

7: $\Diamond\exists x\ @{\sim}\exists y\ x = y \supset \exists x\ {\sim}\exists y\ x = y.$

7 metaphysically reads as 'if it is possible for something to actually be nothing then something is nothing'. The consequent of this claim is a contradiction; something cannot be nothing. Therefore by modus tollens it is not possible for something to actually be nothing. But contingentists assert that it *is* possible for something to actually be nothing, such as in the case where something could have existed, but does not. Therefore Williamson claims that **BF** refutes contingentism. Williamson notes that a contingentist cannot avoid this conclusion by disallowing the rigid @ operator, since **BF** has the following atomic instance:

BF: $\Diamond\exists x\ Fx \supset \exists x\ \Diamond Fx.$

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[51] This proof has been adapted from Hughes and Cresswell, 1996, pp. 246-247.

[52] This use of the @ symbol for metaphysical actuality is controversial. Since Williamson uses it for this purpose, I shall do likewise in what follows.

[53] In English the phrase 'possibly actually the case' could be understood to mean simply that it is 'possibly the case'. The 'actually' thus being made redundant since it is used to refer to what is 'actual' in the *counterfactual* world (rather than as a reference to the 'actual' world of utterance). However, such semantics for the term 'actually' make it meaningless in every situation, since within modal contexts it is redundant (as above), and in non-modal contexts it is redundant by triviality. Used as a rigid designator as here, the term 'actually' allows us to differentiate the 'possible because actual' from the 'possible but not actual'.

We could allow F to stand for the predicate 'is such that it is actually nothing'. That provides a metaphysical reading that claims that 'if it is possible for something to actually be nothing then something could possibly be actually nothing', and the result is metaphysically the same. Using the @ operator thus serves as a way to make the metaphysical interpretation explicit in the logic.

Contingentist options

At the end of these arguments Williamson claims that 'contingentists must choose: either adopt free logic even for the non-modal fragment of their language or restrict necessitation (perhaps both)'.[54] In each of the derivations of **NNE** both the rule of necessitation and **UI**/**EG** are used. However, although restricting the rule of necessitation prevents **NNE** from being a *theorem* is insufficient to prevent **NNE** from being *valid*. Given our current logical structure it is the case that $\exists y\, x = y$ is true in each world, since it is a theorem of LPC and thus a non-contingent theorem of quantified modal logic. As it is true in every world, then no matter what class of frames we take $\Box\exists y\, x = y$ will be true in every world. As x can range across the entire domain D, $\forall x\, \Box\exists y\, x = y$ is valid, and then **NNE** is also valid by similar reasoning. This is a two-fold problem: first it means that, although the *axiomatic system* is not necessitist, all of the *logical models* are; and second it means that no matter which modal system we begin with, the quantified modal system will be incomplete. Neither of these results is at all welcome. Thus the *free logic* option, which adjusts **UI** and **EG**, is the only real contingentist option available in Kripkean first-order quantified modal logic.

[54] Williamson, 2013, p. 42.

Free logic

An atomic instance of the Converse Barcan Formula $\Box\forall x\ Fx \supset \forall x\ \Box Fx$ metaphysically translates to 'if necessarily everything is *F* then everything is necessarily *F*'. Contingentists do not think that everything has to exist, and so something might not have been *F* because it did not exist, even if necessarily everything is *F*. This is because, for a contingentist, 'everything' has to mean 'everything that exists'; therefore a contingentist would deny **CBF** on the basis that, for instance, there could have been fewer things than there are. An atomic instance of the Barcan Formula with universal quantification $\forall x\ \Box Fx \supset \Box\forall x\ Fx$ metaphysically translates to 'if everything is necessarily *F* then necessarily everything is *F*'.[55] Again, a contingentist would reject this claim. Even if everything that does exist is necessarily *F*, that does not stop the possibility of a different thing existing that is *not F*; therefore a contingentist would deny **BF** on the basis that, for instance, there could have been more things than there are. This brief consideration of the implications of **BF** and **CBF** points us toward a deeper contingentist concern with the logical structure: the fixed domain of individuals. *Free quantified modal logic* —free QML— 'corrects' this structural 'defect'.

Free QML blocks the derivations of **NNE** above by restricting **UI** and **EG** as theorems, but it does so indirectly by adjusting the logical structure, and then accounting for this new structure in the quantified axioms. Classical QML consists of an ordered quadruple <W, R, D, V>, and in the process of making LPC modal, V

[55] From existential **BF** we derive the universal version by modus tollens, and the definitions of $\Box$ and $\forall$x.

became world relative, i.e. the set of *n*-tuples of individuals assigned to each *n*-placed predicate was relative to each world *w* in W. D, however, remains fixed in the classical system, and so the individuals themselves were not world relative. Free QML extends the idea of contingency to D as well as V. D is no longer simply a set; it is a function that assigns a set of individuals to each world *w* in W. The set of individuals assigned to a world, D(*w*), comprise the set of individuals that 'exist' in that world, and so becomes the domain of quantification for quantifiers evaluated at that world. Thus $\exists x$ ranges over a different set of individuals at world w_1 than it does at w_2. Metaphysically this accounts for contingentist intuitions. 'Something' at world w_1, might not be 'something' at world w_2, i.e. it can be the case that $D(w_1) \neq D(w_2)$. Once we allow the domain of individuals to be world relative, **BF** and **CBF** are no longer theorems. There are some *inhabited frames* —frames in which D has assigned individuals to the worlds, but V is not given, i.e. <W, R, D>— in which **BF** is valid, and some in which **CBF** is valid, but in the general case they are not valid. If an inhabited frame is such that for any *w*, whenever *w*R*w** we have $D(w) \subseteq D(w^*)$, then **CBF** is valid, i.e. **CBF** is *invalid* only when at some world 'there is something that could be nothing'. If an inhabited frame is such that for any *w*, whenever *w*R*w** we have $D(w^*) \subseteq D(w)$ then **BF** is valid, i.e. **BF** is *invalid* only when at some world 'there could be something that is nothing'. The only way for both **BF** and **CBF** to be valid is if both kinds of inhabited frames are satisfied. This occurs only when for any *w*, where *w*R*w** we have $D(w) = D(w^*)$, i.e. when and only when the domain of each world is fixed.[56] Metaphysically, a fixed domain of individuals for the quantifiers to range over *by itself* structurally translates to the claim that 'necessarily everything is necessarily something', i.e. necessitism.

[56] Or when each disjoint set of worlds has fixed domains. These disjoint sets of worlds can each be thought of as their own frame, and so such cases can be safely ignored with no loss of generality.

How does free QML structure affect theorems like **UI** and **EG**? Consider an atomic instance of **UI**: $\forall x\, Ax \supset Ax$. Now that domains are world relative $\forall x$ ranges only over the individuals in the world of evaluation. The antecedent now says that 'everything *in this world* is *A*'. The consequent, however, states that 'this assigned object is *A*'. This would no longer be a theorem if the 'assigned object' might be something that does not exist in that world, because in that case it might not be *A*. Free QML adjusts **UI** and **EG** by introducing the idea of 'existing' as a predicate, *E*, that applies to the individuals within the domain of the world of evaluation, and represents this predicate within the formulae. V already assigns a subset of individuals to each predicate at each world. Thus we can define V(*E*) as a single placed predicate where V(*E*)(*w*) = D(*w*). This requirement is expressed as an extra axiom: $\forall x\, Ex$. The extra axiom simply states that 'everything exists' —or in modal terms, 'everything in this world exists in this world'. Now, the original metaphysical idea behind **UI** is that if everything is *A* then any individual thing is also *A*; but that assumes that the individual thing is one of the things included in 'everything'. With *E* defined as we have, if we wish to account for this assumption in **UI** we can restrict the assigned individual to the set of *E* individuals, i.e. individuals that 'exist' at that world. We change **∀1 (UI)** to:

UI*: $(\forall x\, \alpha \wedge Ey) \supset \alpha[y/x]$ or $(\forall x\, \alpha \supset (Ey \supset \alpha[y/x]))$.

UI* translates in a non-vacuous atomic case to what we want: 'If everything is *A* then if this assigned thing exists, then it is *A*'. From this we can derive a new **∃1 (EG)**:

EG*: $(\alpha[y/x] \wedge Ey) \supset \exists x\, \alpha$ or $\alpha[y/x] \supset (Ey \supset \exists x\, \alpha)$.

EG* translates in a non-vacuous atomic case to 'if *A* is true regarding some assigned thing then, as long as that thing exists, something must be *A*'.

With **UI** and **EG** now adjusted to **UI*** and **EG*** let us return to Williamson's arguments and see what occurs in free logic. In the proper name argument, the same derivation of **PN** now results in $Ek \supset \exists x\, k = x$. Necessitating this gives $\Box(Ek \supset \exists x\, k = x)$, which a contingentist can happily endorse. It says only that 'necessarily if k exists then k is something'. With the Converse Barcan Formula, the derivation produces $\Box\forall x\, \alpha \supset \forall x\, \Box(Ex \supset \alpha)$. Again contingentists can accept this version of **CBF** since it says in an atomic case that 'if necessarily everything is A then everything is necessarily, if it exists, A'. With the Barcan Formula, the derivation becomes blocked as, depending on which version of **EG*** is used, either the **B** axiom or **∃2** cannot be applied due to the additional existence predicate. The closest claim to **BF** involving an existence predicate that a contingentist could directly endorse is:

BF*: $\forall x\, \Box\alpha \supset \Box\forall x\, (@Ex \supset \alpha)$

In an atomic case **BF*** says, 'if everything is necessarily A then necessarily everything, if it exists in actuality, is A'. The fact that the @ operator is required in **BF*** helps explain why the usual derivation of **BF** using **EG*** instead of **EG** fails to produce **BF***.

Free logic demonstrates that the Barcan Equivalence, $\Diamond\exists x\, \alpha \equiv \exists x\, \Diamond\alpha$, and therefore **NNE**, is a theorem when and only when the range of the quantifiers $\exists$ and $\forall$ is non-contingent, i.e. when the range of quantifiers is the same at each world. It also introduces into the structure the 'location' of individuals that corresponds to their actual existence *at* the worlds in which they are located. Free logic commands a high level of intuitive metaphysical draw as it allows for a very natural understanding regarding the contingency of existence. There are things that exist in each world, and it is these things that we quantify over: things are actually existent things. If necessitists wish to 'speak the same language' as it were, it would be valuable for them to interpret the fixed domain of classical QML inside a free logic structure. We examine ways to do this in the next section.

Models of necessitism

Necessitists wishing to express themselves within free logic, having advocated a fixed domain, D, must confront the further question, 'where are those individuals located?' There are three options: the first is that they are located at each and every world; the second is that they are each located at some worlds, and not at others; and the third is that they are not located anywhere, they are simply a 'worldless set'. The first option is fixed-necessitism, the second is union-necessitism, and the third is trans-necessitism. Each of these options results in the successful validation of the key theorem $\Box\forall x\ \Box\exists y\ x = y$ if $\exists$ and $\forall$ range over the fixed domain D. But the differences in the logical structures, especially since a Kripkean model has a natural metaphysical interpretation whereby the world-relative domains constitute those individuals that 'exist' and are 'actual' at that world, make a huge difference in terms of metaphysical stakes. The *semantics* of the quantifiers are largely read in terms of the *structure* rather than the *theorems*. Without distinguishing which model is the intended necessitist model, it is hard to know what a necessitist means by 'something' and 'everything'. This is compounded by the fact that Williamson describes his intended model as being 'pointed': it isolates one of the worlds as the actual world we inhabit.[57] If 'we' inhabit a particular world inside the model, then it seems that this particular world represents the one that is 'actual' and in which we 'exist'. Therefore the question regarding which individuals are located at our world is a highly important one for our metaphysical understanding as it determines what things are 'actual' and what things 'exist'. The differences in necessitist models show that this question can be answered differently while still validating the necessitist formula.

[57] Williamson, 2013, pp. 104-106.

The fixed-necessitist model interprets classical QML as the 'special case' of free logic in which the domain of each world has a fixed set of individuals. The contingentist and the fixed-necessitist each take $\exists x$ as ranging over the domain of individuals located at that world, i.e. D(w). Since free QML contains the axiom $\forall x\ Ex$ — 'everything exists'— then the fixed-necessitist claim that metaphysically D(w) = D(w*) for all worlds w, $w^* \in$ W, is a claim that both 'necessarily everything is necessarily something', $\Box\forall x\ \Box\exists y\ x = y$, and 'necessarily everything necessarily exists', $\Box\forall x\ \Box Ex$. Both the fixed-necessitist and the contingentist agree that 'to be something is to exist', $\exists y\ x = y \equiv Ex$. The debate is about whether or not the domain of individuals at each world in the metaphysical model of reality is constant or not, judged by whatever standards seem appropriate. In this debate, each side understands the same thing by the quantifiers $\exists$ and $\forall$, but they disagree over what exists in the actual world, and the necessity of that existence, i.e. the theoremhood of $\Box\forall x\ \Box Ex$. As Cresswell notes, when the debate is couched in these terms it 'really does seem that the necessitist and contingentist disagree about the extent of what there is', but as he later points out, 'there is another way to take the debate between necessitists and contingentists'.[58]

The other way that Cresswell mentions is the union-necessitist model. As Williamson acknowledges:

> *'Kripke's model theory enables us to define a quantifier restricted to the variable domains, which therefore violates BF and CBF, but it also*

[58] Cresswell, 2014, p. 334.

enables us to define a wider-reaching quantifier over the union of those domains, which therefore satisfies both principles.'[59]

The union of world domains is fixed, and so a new quantifier defined as ranging over the union of world domains once again validates **BF** and **CBF**. Whereas fixed-necessitism models the idea that necessitism is a special case of free logic in which D(w) is constant at each world, in union-necessitism D(w) can vary, and yet quantification is still, in a more broadly defined sense, necessitist. The union-necessitist model has two quantifiers, one over contingent 'things' —a world relative quantifier— and another over necessary 'things' —a united-world quantifier. We formally construct the union-necessitist model as follows. We begin with the structure outlined in the previous section: a free QML model of an ordered quadruple <W, R, D, V> where D assigns a set of individuals to each world w in W. We then construct a new set of things U = $\cup$D(w) for all worlds $w \in$ W. Although this set need not be included in the n-tuple of the model, since the alternate quantifier can be expressed in terms of D, let us include it for reasons of clarity, although maintain the relationship between U and D as expressed.[60] A model now becomes an ordered quintuple <W, R, U, D, V>. We also add two new quantifiers: Λ and Σ. Λx reads as 'for every x' and Σx reads as 'for some x', both of which range over U rather than D(w). Classical QML axioms, including the original **UI** and **EG**, apply to Λ and Σ; while the free logic equivalents, including **UI*** and **EG***, apply to ∀ and ∃. Note that this model does not rule out the special case possibility of each world having a fixed domain. If it is the case that D(w) = U for each world w in W, then it would simply mean that $\exists x\ \alpha \equiv \Sigma x\ \alpha$ and $\forall x\ \alpha \equiv \Lambda x\ \alpha$. This demonstrates a hierarchy of generality concerning the positions. Contingentist quantification is a restricted quantification compared to

[59] Williamson, 2013, p. 129.
[60] Hughes and Cresswell, 1996, formulate a free logic model this way. See pp. 303-304.

union-necessitist quantification over the union of domains, while fixed-necessitism is a special case of contingentist free logic.

Williamson appears to be comfortable affirming that union-necessitist quantification results in necessitist metaphysics. He states that when the union quantifier is introduced ‘the necessitist wins at once, for the first quantifier is a restriction of the second, …the controversy between necessitism and contingentism concerns only the unrestricted quantifier, presumably modelled by that over the union of the domains’.[61] His position assumes that contingentists and necessitists share an understanding regarding the way that the term ‘something’ is to be used in the debate, an assumption that seems, particularly in this context, completely unjustified; given the fact that in union-necessitism the contingent quantifier is explicitly *not* the necessary quantifier. I will not make this assumption. That being the case, the debate between union-necessitists and contingentists hinges on a different disagreement to that outlined previously between fixed-necessitists and contingentists. Union-necessitists and contingentists can agree, at least in principle, about what exists in the actual world. As Cresswell points out, a union-necessitist might reason that ‘the separate domains for each world are metaphysically basic, because ultimately the ‘logical’ notion of existence depends on the world-dependent domains’.[62] However, motivated by a need to quantify and predicate on to things that are not within the domain of evaluation at that world, a union-necessitist adds an extra quantifier that goes beyond the world-restricted set, and ranges over the union of the domains. If a union-necessitist affirms that ‘necessarily everything is necessarily something’ then it must be this united-world quantifier that represents the metaphysical ‘something’: $\Box\Lambda x\ \Box\Sigma y\ x = y$.

[61] Williamson, 2013, p. 129.
[62] Cresswell, 2014, p. 334.

The union-necessitist uncouples the concept of 'being something' from the concept of 'existing': Σx means 'something' while $\exists x$ means 'some existing thing'. Nino Cocchiarella voices the union-necessitist intuition saying:[63] 'somehow within the realm of all the objects we refer to in one way or another, i.e. within the realm of possibilia, we are able to distinguish or separate out those objects possessing the mode of actual existence from those possessing some other mode'.[64] Unlike the fixed-necessitist, the union-necessitist *disagrees* with the contingentist claim that 'to be something is to exist'; the union-necessitist claims instead that 'there are things that do not exist'. But also unlike the fixed-necessitist, the union-necessitist can *agree* with the contingentist that 'there is something that might not have existed' and that 'it is possible for something to exist that does not exist'. But we must be *very* careful here when translating these apparent agreements and disagreements into logic, since the metaphysical term 'something' is interpreted differently by each speaker. Closer inspection demonstrates that the disagreements occur when what is said is true regarding one quantifier but false regarding the other, while agreements occur when the claim is true regarding both quantifiers. In the disagreement, the contingentist claims 'to be something is to exist', $\exists y\, x = y \equiv Ex$ (the union-necessitist would agree with this if expressed in the logic), which the union-necessitist hears as $\Sigma y\, x = y \equiv Ex$ and disagrees, responding that on the contrary 'there are things that do not exist', $\Sigma x \sim Ex$ (which if the contingentist were to naturally translate into the logical $\Diamond \exists x\, @{\sim}Ex$

[63] Although Cocchiarella does not believe that existence is metaphysically basic, unlike Cresswell's union-necessitist. Cocchiarella argues for certain 'e-predicates' that result in the existence of the objects to which they are applied, while other predicates have no such result (Cocchiarella, 1969, p. 44-48). This makes it possible to read him as a trans-necessitist rather than a union-necessitist (see later).
[64] Cocchiarella, 1969, p. 45.

would also probably agree with)[65] which the contingentist hears as $\exists x \sim Ex$ and disagrees. And it is not only the metaphysical disagreements that are pseudo-disagreements, the same is true of the agreements. The contingentist says 'there is something that might not have existed', $\exists x \Diamond \sim Ex$, which the union-necessitist hears as $\Sigma x \Diamond \sim Ex$ and nods. Thus the disagreement is regarding how to interpret the quantifiers into metaphysics, rather than regarding the way each quantifier functions in the logical structure. That is not to say that there cannot be grounds for choosing union-necessitism over contingentism, or vice versa. It could be that union-necessitists successfully argue that including the Σ and Λ quantifiers allows for a greater range of expression in the logic,[66] as well as overcomes certain difficulties regarding predication, and that as the unrestricted form of quantification, they deserve the label of the most unrestricted metaphysical term of quantification, that of 'being a thing'. A contingentist might instead contend that Σ and Λ complicate the logic unnecessarily for little or no gain in expressive strength, and all or most expressions with Σ and Λ can be phrased in more intuitive terms using $\forall$ and $\exists$. There might also be interpretive reasons for choosing one over the other. We could contrast the logical quantifiers in terms of which best represents our metaphysical understanding of what it is to 'be something' and what it is 'to exist', as well as examine the way the quantifiers function in the logic compared with common language and intuitions.

[65] The 'natural translation' given here for the contingentist assumes an S_5 system of logic. Without this assumption there is no easy way for a contingentist to interpret Σx in terms of $\exists x$. I say here 'probably agree with' as the contingentist may take an approach that rejects bivalence for non-existent things. See Prior, 1957, pp. 29-54 and Williamson, 2013, pp. 64-71.

[66] One example is a way to distinguish the two readings of 'two different houses could be built on this plot'. One reading imagines two houses *both* built on the plot, $\Diamond(\exists x \exists y\ Hx \wedge Hy \wedge \sim x = y)$ the other assumes only that the house might be one of two possibilities, $\Sigma x\ \Sigma y\ (\Diamond Hx \wedge \Diamond Hy \wedge \sim x = y)$.

The third model is a little different to the first two. In trans-necessitism, the necessitist rejects the D(*w*) function of free logic, and insists on maintaining the classical structure *as is*, with a fixed domain D. This is not the original classical position that simply ignores the question of where the individuals are located; it is a positive commitment to saying that, given the metaphysics of free logic, the individuals in D are not located anywhere. At first this may suggest that the trans-necessitist is committed to saying that things do not ‘exist’; although that is one legitimate way to read the model, it is not the only way. It is primarily a model that represents a certain priority of individuals over the concept of existence. In trans-necessitism an inhabited frame is simply <W, R, D> where D is a fixed ‘worldless’ set. In each of the other positions *inhabited frames* already locate the individuals at worlds with D(*w*), and thus V(*E*) is predetermined prior to its introduction into the model with V. Since it is possible to discuss inhabited frames in a way that is separable from models that include V, inhabited frames naturally suggest a certain priority, or fundamentality, when contrasted with models. Free logic naturally translates to a metaphysics that sees existence as a predicate that precedes all other predicates, determined simultaneously with the set of individuals. Trans-necessitism, however, suggests that individuals are not world bound —we might say there are no ‘actual’ individuals— nor *fundamentally* ‘existent’. Individuals are primitive and non-modal, only predicates are modal.

As regards the existence predicate, in the first interpretation of trans-necessitism, the one-place existence predicate is rejected. Things do not exist, because things are not the right kind for existence to predicate of. Things bear predicates in a world, and so those predicates ‘exist’ and are related to the thing *at* that world, but the *thing in itself* does not exist in any world, e.g. the thing exists *as* a red thing, but this is only an unnecessarily complex metaphysical reading of *Rx*; representing it logically as $Ex \wedge Rx$ is both redundant and misleading. Things are viewed as a uniting element that traces changes of predication *through* worlds. Things are 'trans-modal'. They are primitive elements of modality just as the worlds themselves are. In the second interpretation of trans-necessitism, it may be that some individuals exist at a particular world and others do not, as with union-necessitism. This existence is predicated on them by V(*E*) just as any other predicate might be, it is not a fundamental requirement of their status as 'individuals'. However, in trans-necessitism as opposed to union-necessitism, existence is better understood as a secondary, completely derived predicate, i.e. we have $Fx \supset Ex$ where *F* is some predicate from a set of existence entailing predicates.[67] Some implications of this are that existence is not necessary for being a thing, just as some individual might not be 'red' in any world, some individual might not 'exist' in any world. Also, as *E* has no priority over any other predicate, the trans-necessitist sees no reason to derive a new function D(*w*) within a model on the basis of V(*E*), any more than we might derive a special D(*w*) function on the basis of 'being red'. If we wish to quantify only over 'existent' individuals we are free to do so, but that is done easily enough with $\exists x\ (Ex \wedge \ldots)$.

Metaphysically the trans-necessitist differs from each of the other positions, and in a way that goes beyond terminology. While contingentists, fixed-necessitists and union-necessitists all endorse the free logic axiom $\forall x\ Ex$ a trans-necessitist does not. A union-necessitist might point out to the trans-necessitist that while he *does* endorse $\forall x$

[67] This is close to Cocchiarella's claims about existence entailing predicates. He justifies this assumption from an epistemological rather than metaphysical standpoint. See Cocchiarella, 1969, pp. 44-48.

Ex, he *does not* endorse $\Lambda x\ Ex$ and this might perhaps represent a common metaphysical understanding. If the trans-necessitist treats the semantics of his or her own $\exists x$ similarly to the union-necessitist's Σx, then a different metaphysical disagreement surfaces. The union-necessitist endorses $\Lambda x\ \Diamond Ex$, whereas a trans-necessitist does not. On the contrary, a trans-necessitist claims that 'possibly something necessarily does not exist', which, given the B axiom, implies 'something necessarily does not exist'. This difference reflects the derived nature of individuals in the union-necessitist's model from the union of 'existent things' in D(w), whereas the trans-necessitist model treats individuals as fundamental.

The genuine debates regarding the merits and costs of the various necessitist models when compared with contingentism seem highly varied, and are fought over different territory. It may be true that each type agrees that 'necessarily everything is necessarily something', but they disagree on the topic of whether or not 'necessarily everything necessarily exists', as well as whether 'necessarily everything possibly exists'. Thus each version has a distinct burden of justification, as well as its own distinct metaphysical stakes. As a result, the three brands of necessitism warrant both separate treatment and adjudication. At this point I have described the kinds of inhabited frames, and quantifiers that apply in those frames. On a natural metaphysical reading of these structures, we can take the world-relative domain of individuals as the set of things that exist in that world, and we can take the quantifiers to represent what counts as a 'thing'. I have also examined the quantificational axioms that are valid in each structure, as well as a brief outline of the points of disagreement between the positions that result from the various structures. Before we move on to analyse the metaphysics of each system in detail, a brief word about an appropriate modal structure is in order.

Metaphysical S_5 modality

'There is a compelling argument that if possibility and necessity are non-contingent, then MU [the metaphysically appropriate model] is exactly the system S_5.' Timothy Williamson. [68]

S_5 has always been a favourite for metaphysical modality. The intuitive metaphysical draw of **T**, **4**, and **B**, force those that would endorse an alternate system to justify themselves. I do not wish to get drawn into a lengthy defence of S_5 as an appropriate metaphysical model, however in light of our discussions regarding union-necessitism it is worth noting that a similar consideration could be used in order to justify S_5 as a modal system of 'unrestricted possibility', without needing to demonstrate that weaker systems are metaphysically unimportant.

First we should note that R need not be defined as a dyadic relation, it could also be defined as a function that maps a set of worlds to each world *w* in W. The set of worlds mapped to a world *w* by R is then the set of worlds that *w* is related to. As long as for each world $w \in$ W we have $w \in$ R(w) the frame is reflexive; as long as for each w, $w^* \in$ W if we have $w^* \in$ R(w) then R(w^*) $\subseteq$ R(w) the frame is transitive; and as long as for each w, $w^* \in$ W if we have $w^* \in$ R(w) then $w \in$ R(w^*) the frame is symmetric. With this adjustment, in a union-necessitist model, R functions over W just as D functions over U: they each assign a sub-set of members from the set to a world.

[68] Williamson, 2013, p. 110. Further justification for S_5 is found on pp. 110-111.

We saw previously that for metaphysical reasons a philosopher might argue that not all members of U 'exist' in a given world, since existence is a contingent feature of things, thus they quantify contingently over D(*w*). One response is to directly argue against that notion by claiming that existence is necessary, i.e. argue for fixed-necessitism. However there is also the option of a union-necessitist response. The union-necessitist acknowledges that a contingent concept of existence is metaphysically basic, but there are also times when we might wish to talk in terms that are non-contingent, i.e. times when we wish to quantify over U rather than D, and thus they introduce an additional quantifier that ranges over the union of domains. In a similar way, imagine that a philosopher argues for some weaker modal system because they wish to account for the contingency of necessity and possibility. One response, similar in nature to fixed-necessitism, is to argue for S_5 on the grounds that modality is non-contingent —we might call this person a fixed-modalist. However there is also another response; a union-modalist response. They acknowledge that modality may indeed be contingent, and could perhaps even be so in a metaphysically basic way. But due to a desire to express things in an 'unrestricted' modal way, they form new necessity and possibility operators that range, not over R(*w*), but over W directly. These new modal operators behave *as though* they were in an S_5 system of modal logic, just as Σ and Λ behave *as though* they were in a classical QML structure, without denying we might have need to speak in modal —or quantificational— terms that are contingent.

For the rest of this piece I shall assume an S_5 system of modality. For those that object to this assumption, consider me a union-modalist, discussing what is possible in an 'unrestricted' way. Thus the conclusions reached represent what can be said only in terms of this unrestricted possibility. Since I will make no use of talk in contingent modal ways, I forego the need to introduce new modal operators, and simply use the standard $\Box$ and $\Diamond$ in an unrestricted, S_5, sense.

Williamson's necessitist metaphysics

'Abstract' is not purely negative in meaning; it has its own positive paradigms, such as numbers and directions… 'Concrete' is not purely negative in meaning either; it has its own positive paradigms, such as sticks and stones… Perhaps some things are neither, even if nothing can be both.' Timothy Williamson.[69]

Williamson justifies necessitism metaphysically by introducing a novel mode of being. He creates space for this new mode by arguing that the two familiar modes of 'abstract' and 'concrete' need not be exhaustive. This 'third mode of being' then becomes the answer to the obvious question: given that necessitism says that this coin is necessarily something, if the coin had not been minted, what would it be? Williamson's response is that it would have been something that *could have been a coin* and thus labels it a *possible coin*.[70] Williamson clarifies what this entails by saying that we must read 'possible coin' in an *attributive* sense as '*x* could have been a coin' rather than in a *predicative* sense as '*x* is a coin and *x* could have existed'. A possible coin, says Williamson, is not a coin, because being a coin requires bearing certain properties such as physical extension, which a possible coin does not posses; a possible coin is non-concrete *and* non-abstract. Williamson wants us to read 'possible coin' as we might naturally read 'possible murderer'.[71] If Professor Plum is a possible murderer then he *could be* a murderer. It is the status, rather than the existence, that is possible. Now, Professor Plum's 'possible murderer' status means that he may or may not be a murderer. Neither *being* nor *not being* a murderer is ruled out by being a possible murderer. It does however rule out the option of him being *not possibly a*

[69] Williamson, 2013, p. 7.
[70] With this claim Williamson is effectively (as he notes in fn. 16) assuming the B axiom of modal logic. This axiom states that if something is the case then it is necessarily possibly the case.
[71] Williamson, 2013, p. 11.

murderer. Let us take the situation in which Professor Plum is possibly, but is not, a murderer. We could say that in this case he is a *merely possible murderer*. A similar situation arises when considering a coin under necessitism. The coin is necessarily a *possible coin* whether or not it is a coin. If it *is* a coin then it is both a *possible coin* and a coin. If it is *not* a coin then it is both a *possible coin* and a *merely possible coin*.[72]

Williamson then responds to the further natural question: 'what is the merely possible coin *actually*?' He replies that 'such questions are in effect a challenge to give more 'concrete' properties of the… contingently non-concrete thing. However, it is contentious to presuppose that everything non-abstract has such more 'concrete' properties… Necessitists will naturally reject the challenge, since they deny that the abstract and concrete are jointly exhaustive'.[73] That is not to say he thinks nothing can be said about merely possible things. By virtue of being 'things', they can bear properties such as the logical properties of being self-identical and being denoted by their name. But he claims that despite these properties 'the merely possibly concrete is typically characterised in terms of what it merely could have been. For example: it is a merely possible coin'.[74] Williamson labels this non-concrete, non-abstract mode of 'merely possible' being as an intermediate category between abstract and concrete being. However this is to misrepresent the detail and cause potential confusion. He admits that 'a necessitist willing to postulate the intermediate category can agree that nothing concrete in some possible circumstance is abstract in others';[75] but also that 'necessitism requires the barrier between the concrete and non-concrete to be modally

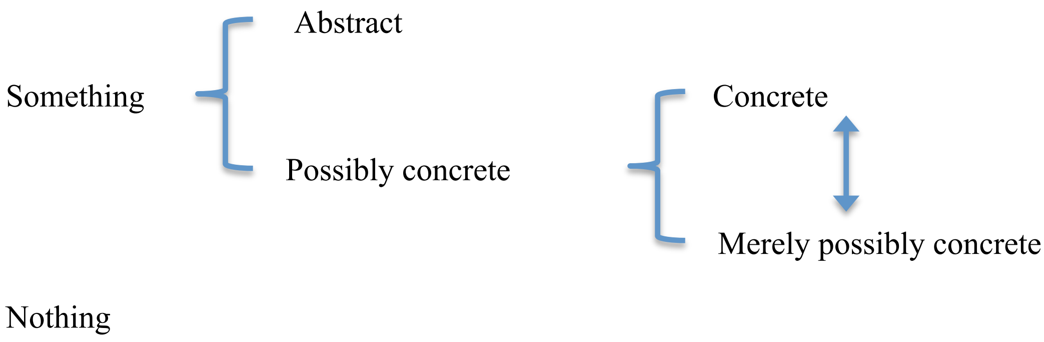
[72] Williamson, 2013, pp. 10-14.
[73] Ibid. p. 13.
[74] Ibid. p. 13.
[75] Ibid. p. 8.

(and temporally) permeated in both directions'.[76] These claims follow quite naturally from the role each mode of being plays within Williamson's metaphysics. When taken together they highlight the fact that there exists a relationship between the intermediate category and the concrete category that does not similarly exist between the intermediate category and the abstract category. Something can be in the intermediate category in some circumstances, and within the concrete category in others, while something abstract is necessarily abstract. At first it seems that both contingentists and necessitists agree that there are both contingent (permeable) and necessary (impermeable) modes of being. But if we inspect Williamson's proposal further we find a deeper divide that results, not in a trinity of being, but a reconfigured duality. The foundational categories of being under Williamson's metaphysics are the *necessarily abstract* things and the *necessarily possibly concrete* things.[77] The second option covers both the concrete and the intermediate since they are both *possibly concrete* things. These two categories are not permeable at all and so represent a more fundamental divide.

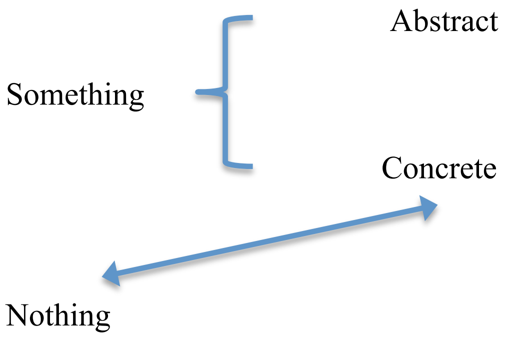
Behind these modes of being, for both contingentists and necessitists, sits a more fundamental mode still: that of 'being something'. A contingentist would agree with Williamson that each mode of being is populated exclusively by 'things'. The difference is not about whether or not what has being is a thing, but what *scope* being has, i.e. what is required in order to 'be'. For clarity I diagram the hierarchy of being for each position below:

[76] Ibid. p. 7.
[77] Labeling this category as such makes the B axiom of Williamson's metaphysics explicit.

Necessitism



Contingentism



The diagram suggests that the crux of the dispute is that necessitism holds the category of ‘something’ to be a *universal* and *impermeable* category, while contingentism holds that it is a *universal* and *permeable* category, matched with a likewise *permeable* category of ‘nothing’. This leads Williamson to couch the debate in terms of what things there are on an *unrestricted* reading of ‘something’. The idea is that ‘something’ is universal for both parties since necessitists and contingentists agree that ‘everything is something’ —an unrestricted reading of everything/something— the disagreement is only regarding the *necessitation* (the permeability) of the quantificational terms: ‘necessarily everything is necessarily something’.[78]

[78] Williamson, 2013, pp. 14-18.

The vagueness of Williamson's metaphysics

Williamson's couching of the debate has severe pitfalls, and makes it extremely difficult to account for necessitist metaphysics inside a logical structure. When arguing for the 'intended' model for metaphysical representation, Williamson explicitly endorses S_5 modality and a fixed domain D, i.e. classical S_5 QML.[79] But as we have seen this can be represented in a number of ways inside a free logic structure. As regards the debate at hand, we need to know whether merely possible things are located at the pointed world or not, in a 'free logic' sense. If so, then it seems that they 'actually exist'; if not then their mode of being requires clarification. Williamson does discuss the terms 'exist' and 'actual' in relation to his metaphysics, although neither discussion truly settles the issue.

Up until now I have avoided attributing existence to Williamson's merely possible things. Williamson dislikes the term 'exists', thinking that it causes confusion when addressing this debate. The reason he gives is that in the debate it is too easy to read the term 'exists' with tacit restrictions:

> *'the distinction between restricted and unrestricted readings is less obvious for 'exists' than for the quantifiers 'something' and 'everything'. It is therefore more likely to cause philosophical confusion. Consequently, it is best not to use the term 'exists' as a key term when formulating philosophical theses'.*[80]

He continues to give examples of such confusion such as those who say that events do not 'exist' they occur, and others that say that numbers do not 'exist'; Williamson

[79] See chapter 3 of Williamson, 2013.
[80] Williamson, 2013, p. 19.

puts these restricted readings down to an overly concrete understanding of what is required to exist. Since the necessitist maxim 'necessarily everything is necessarily something' only holds on a reading that includes more than the concrete, Williamson thinks that the 'noise' generated by restricted readings of the term 'exists' makes the required unrestricted reading 'hard to hear'. However he does allow that, 'if we read 'exists' as 'is (unrestrictedly) something', we can restate necessitism as 'Necessarily everything necessarily exists''.[81] In analysing the importance of this metaphysical explanation, Williamson's admission to the possibility of understanding necessitism as committed to the necessary existence of all things, is of no help. It is made only on conditions that equate existence with 'unrestricted thingness', i.e. it defines the 'existence' of these things in self-referential terms and gives us no clue regarding its modal scope. It is also somewhat frustrating that Williamson justifies this on the basis of avoiding restricted readings of existence that disallow 'events' and 'numbers'. Clearly he wants 'unrestrictedly something' to include events and numbers, but this concern seems peripheral to the central issue of the modal scope of his quantifiers. We are left only with the conclusion that merely possible things exist, but not as we know it. We certainly have not been given enough grounds to apply the existence predicate, *E*, of free QML to merely possible things, but nor do we have enough grounds to *not* apply it. Thus the attribution of a particular brand of necessitism to Williamson would be premature.

His discussion of the term 'actual' is more promising in this regard. Williamson distances the necessitism-contingentism debate from the actualism-possibilism debate. The actualist argues that 'everything is actual', while the possibilist argues

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[81] Ibid. p. 18.

that 'everything is possible'. Williamson thinks that this debate is 'hopelessly muddled' as the debate has no way to clarify the stakes:

> *'What is it for something to be actual… ? 'To be actual is to be in the actual world' is no better than a pseudo-explanation, for 'in the actual world' is more obscure than 'actual'.'*[82]

Williamson then considers the possibility that the term might be understood in the way it operates in terms of logical structure. The actuality operator, that Williamson himself makes use of, acts as a rigid designator for the world of reference. But this, Williamson claims, is no use 'since whatever is is, whatever is actually is: if there is something, then there actually is such a thing. So on this understanding, actualism is trivially true and possibilism trivially false'.[83] In effect then, Williamson claims that the actualist maxim 'everything is actual', read in the sense being described, is trivial. This gives us considerable grounds to rule out union- and trans-necessitism as being Williamson's position since they do not think that everything is actual. For instance, in a union-necessitist structure it is not trivial that 'if there is something then there actually is such a thing'. Intended as a central claim regarding the debate between whether what there is is actual or not, the antecedent 'there is something' would be translated as $\Sigma y\ x = y$, while the consequent term 'there actually is such a thing' would be translated $\exists y\ x = y$. Now, it is *not* a theorem of union-necessitism that $\Sigma y\ x = y \supset \exists y\ x = y$, since x might be assigned to an individual outside the domain of the actual world. Equally this claim suggests that Williamson is not a trans-necessitist, since they also do not think that 'if there is something then there actually is such a thing' either. Again, if intended as a central claim regarding the debate surrounding the actuality of individuals, a trans-necessitist would naturally translate the antecedent

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[82] Ibid. p. 22.
[83] Ibid. p. 23.

'there is something' as $x \in \mathrm{D}$, while the consequent 'there actually is such a thing' would be rendered $x \in \mathrm{D}(w)$. A trans-necessitist logic is not structured so that $\mathrm{D} \subseteq \mathrm{D}(w)$ and so would reject the claim. Thus, if Williamson *does* claim that 'if there is something then there is actually something' is trivially true he must be rendering it logically in a fixed-necessitist or contingentist way as $\exists y\, x = y \supset @\exists y\, x = y$, which is trivially true as there are no modal operators in the consequent for @ to act upon. We should be careful how much we read into this though, as it does not seem Williamson's intent to rule out the possibility of defending necessitism on union-necessitist grounds, especially since he explicitly endorses it as a favourable position to his cause.[84] It seems more likely that Williamson had not noticed the consequences of his claims here and was simply dismissing the couching of the debate in terms of actuality as unhelpful. It does however lend weight to the likely possibility that Williamson has fixed-necessitism front and foremost in his mind when arguing for necessitism.

With little to go on regarding the actual existence of third mode things, how are we to understand the nature of unrestricted quantification? The ontological shock of the necessitist claim that 'necessarily everything is necessarily something' comes when 'something' is read as restricted to actually existing things: 'necessarily everything actually exists'. Without an assurance that necessitism does result in this conclusion, it might be suspected of triviality. Williamson defends the non-triviality of the necessitist claim when he writes:

> *'That 'something' is unrestricted implies that the things it ranges over include whatever merely possible coins there are, if any. It does not imply*

[84] Ibid. p. 129.

> *that there are or could be any merely possible coins for 'something' to range over. However widely 'something' ranges, it does not range over an assassin of Kant, for he was not assassinated. Unrestricted quantification is only a device for talking about what was already there. It does not trivialise necessitism'.*[85]

In light of the above discussion, this argument is circular. He says that we must read 'something' as ranging unrestrictedly, but not unrestrictedly in the sense of ranging over things that *are not* there, but only over those things that *are already* there. What could this mean if not that 'something' ranges only over things that 'exist' or are 'actual'? Surely his point about Kant's assassin is that, since Kant was not assassinated, an assassin of Kant does not 'exist' for 'something' to range over, or perhaps that there is no 'actual' assassin of Kant for 'something' to range over (presumably there is a merely possible assassin of Kant). And yet, as we have seen, it seems to be the case that Williamson refuses to ground quantification in such a way. Without grounding the range of 'something' in other metaphysical terms it becomes more than difficult to judge the metaphysical stakes of necessitism, or whether there even are any. Yet despite this Williamson seems eager to stress that he does not take thingness as a primitive non-modal concept up front. Trans-necessitism, as we have seen, takes thingness to be primitive, and thus *does* trivialise the central necessitist claim that 'necessarily everything is necessarily something'. In trans-necessitism, 'something' is not a way of quantifying 'what was already there', no matter how we interpret that claim. It thus seems highly likely that this is *not* Williamson's position. However this does little to enable us to get to grips with the grounding of quantification in his metaphysics.

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[85] Ibid. pp. 15-16.

Suffice it to say that the term ‘something’ is no more likely to be a neutral term in the contingentist-necessitist debate than the term ‘exists’ or the term ‘actual’. No *semantically* common ground with contingentists is to be found in a shared understanding of the universality of ‘thingness’ whatever the *syntax* might suggest. Thus Williamson’s attempt to couch the dispute in a neutral semantic of quantification itself appears ‘hopelessly muddled’. And yet there does appear to be a genuine distinction between the logical models we have outlined in previous sections. The positions, when expressed in terms of a commonly interpreted logical structure result in genuine disagreements, either ontologically or terminologically. In the next sections I introduce Williamson’s metaphysics into each necessitist structure in order to ascertain the metaphysical stakes of each position, and what kind of things these ‘merely possible things’ are, i.e. what constitutes the ground of their being.

Fixed-necessitist metaphysics and grounding

To interpret necessitist metaphysics inside a fixed-necessitist structure, it will be necessary to treat merely possible things as *actually existing* merely possible things, as fixed-necessitism claims that $D(w) = D(w^*)$ for all w, $w^* \in W$. That being the case, it should be possible to predicate this mode of being on to those things. The debate then becomes a matter of deciding between the contingentist claim that 'x is nothing' and the necessitist claim that 'x is a merely possible thing', and examining the stakes at play. We have a notion of what is logically involved in the contingentist claim, but how ought we to represent the necessitist claim in fixed-necessitist logic? A first attempt to do this would naturally be to use 'merely possible thing' as a predicate. Thus where a contingentist would say $\sim\exists y\ x = y$, 'x is nothing', a fixed-necessitist says Mx, 'x is a merely possible thing'. Here we need to be careful. If M is an atomic *predicate* inside QML it ought not to be surreptitiously modal in semantic content. Modal logic, if it is to be a robust language of modality, should be capable of exclusively representing modality syntactically through the use of $\Box$ and $\Diamond$, anything less is shirking responsibility. For instance, LPC may be syntactically simple, and it may also be possible to represent modality via predicates, e.g. PFx read as 'x is possibly a Flamingo', but that is hardly a reason to prefer it to the more complex quantified *modal* logic. The idea of modal logic is to extract modality from inside predicates in order to explicitly represent it, and thus assess modality using logical principles without the use of semantically modal predicates.

Now, for fixed-necessitists, it should be the case that Mx is *not* modal in content, but simply an adjective describing the *kind of thing* x is, no more modal than the term ‘abstract’ or ‘concrete’. We might prefer to read *Mx* as ‘*x* is a mere possibility’ —as opposed to ‘*x* is merely possible’— insisting that this is talking about what *x actually is* rather than what it *merely possibly is*. But the potential for confusion and equivocation in this rendering is considerable. For instance, intuitive weight for the position might then be gained from viewing the necessitist metaphysics as justified by the following:

1. *x* possibly exists,
2. Thus *x* exists as a possibility,
3. Thus *x* has a kind of existence,
4. Thus *x* exists.

This apparent justification relies on an equivocation between a reading of ‘exists as a possibility’ that interprets it, in the step from 1 to 2, as equivalent to 1 —i.e. ‘*x* exists only in the sense of being a possibility’— and one that interprets it, in the step from 2 to 3, as equivalent to 3 —i.e. ‘*x* has a kind of actual existence that can be described as ‘possible’’. It seems that the equivocation hinges on the fact that the word ‘possibility’ can be read as either an *adverb* regarding the modal nature of *x*’s existence, or as an *adjective* regarding the existence itself. Consider a parallel argument in which the equivocation is more obvious:

1. This pound coin could possibly have been a euro,[86]
2. Thus this pound coin is a possible euro,
3. Thus this pound coin is a kind of euro,
4. Thus this pound coin is a euro.

What occurs in these arguments is a change of scope regarding the central term of ‘existence’ and ‘euro’. From 1 to 2, the scope is modal: *x* exists as a possibility in as

[86] For instance, if the UK had entered the European single currency at its inception ‘this pound’ could have been ‘this euro’.

much as its existence is centred in possible non-actual circumstances. From 2 to 3, its scope is non-modal: the existence referred to has become actual. In logic we have 1 rendered as $\Diamond Ex$ and then 2 also rendered as $\Diamond Ex$. But then 2 changes from being $\Diamond Ex$ to being Mx, which is the predicate reading of 3. 3 to 4 is then simply the implication $Mx \supset Ex$. But if Mx is to be non-modal then we ought not have $\Diamond Ex \equiv Mx$ as a theorem, and so the argument is false.[87] What seems to happen in the argument is that the range of existence has gone from a union-necessitist 'something' range, to a fixed-necessitist/contingentist 'something' range. A union-necessitist allows $\Diamond Ex \supset \Sigma y\, x = y$, but then $\Sigma y\, x = y$ becomes *semantically* adjusted to $\exists y\, x = y$, and thus allows for the derivation of Ex via $\exists y\, x = y \supset Ex$. The fact that this argument has any apparent weight to it demonstrates that we have two conceptions of what being a thing is: one requires a thing to be actual; the other is a broader conception that covers counterfactual, non-actual, things. The first conception is the fixed-necessitist and contingentist conception, the second is the union-necessitist and trans-necessitist conception. I am not accusing Williamson of equivocating directly, but the entire metaphysics seems to gain confused credibility from the equivocation that is possible under such a rendering of the metaphysics. When discussing necessitist metaphysics inside a fixed-necessitist structure, we must ensure that such equivocation does not occur, and that we only consider these exotic 'merely possible things' as actually existing things, with an existence rooted in the actual world.

To avoid the problems of equivocation that occur I suggest a new predicate for labelling 'actually existing merely possible things'. I simply label these things 'third mode' things, and predicate it as Tx. Thus there are three modes of being —abstract,

[87] Shades of the ontological argument can be found here. For a discussion of the ontological argument in the context of the existence predicate see Salmon, 1987, pp 49-108.

concrete, and third— and these exhaust the options: $\Box\forall x\ \Box(Ax \vee Cx \vee Tx)$. Understood this way, *T* existence is a mode of being comparable to abstract being and concrete being, i.e. it is an *actual* mode of being, predicated upon members of D(*w*) by V(*T*). At this point an old question returns: 'what *is* a third mode thing actually?' Contra Williamson, this need not be a request for concrete properties, since it is understood that these things are not concrete. Claims regarding abstract properties are understandable —a triangle 'has three sides' for instance. The request, then, is for an actual property that is not purely arbitrary in order to ground the individual's actual existence. Typical metaphysical intuitions suggest that what we call things are things due to some independent existence or properties that they possess in order to ground their 'thingness', i.e. that thingness is not primitive. We *encounter* an object in some way first via its properties, and then label it a 'thing'. Nino Cocchiarella expresses this intuition when he claims that 'to maintain that an existing object exists in virtue of its possessing the attribute of existence… is merely to fudge the issue', instead he claims that there are certain attributes an individual may have that concern 'the very process by which we confront the existent'.[88] Even abstract things such as numbers are first encountered by way of concrete grounding such as understanding four as the number of legs on a horse, and then understood as separable individuals by *abstraction*. The suspicion could be that if *Tx* is simply a way of predicating a mode of being on to 'third mode' things, it is a 'fudge' that represents a primitive thingness in predicate form, similar to a predication of 'existence'. If *Tx* is to be accepted as a positive mode of being then it ought to be grounded in terms of 'confrontable' attributes.

[88] Cocchiarella, 1969, pp. 44 and 46.

It seems that Williamson has no intention of appeasing grounding concerns as discussed above. In fact he suggests that grounding concerns become a difference of metaphysics in the contingentist-necessitist debate. When accounting for one of the reasons why a contingentist might reject necessitism, Williamson says that a contingentist may have a 'positive conception on which necessarily everything is grounded in the concrete, in some sense in which the necessitist's contingently non-concrete objects [merely possible things] do not count as so grounded. Being concrete trivially entails being grounded in the concrete… [and] an abstract object may be grounded in the concrete without itself being concrete'.[89] Williamson calls contingentists that regard concrete grounding as necessary for being a thing 'chunky-style contingentists', since he labels things grounded in the concrete 'chunky things'. In contrast to this position he claims that necessitists 'typically deny that everything is chunky'. The abstract and the concrete are grounded in the concrete, but the merely possible are not since they are neither concrete nor abstract. Now, claiming that third mode things are not grounded in the concrete is not the same as claiming that they are not grounded at all. Williamson is quick to point toward actual relational predicates possessed by third mode things, such as being self-identical, being designated by their name, or being picked out by a unique description. These could perhaps then be transformed into a passive single-placed predicate such as '*x* is a described thing' if non-relational properties are required for grounding. But here it could be argued that such properties are not existence, or even thingness, establishing. The concept of 'confrontable' attributes outlined by Cocchiarella is most naturally interpreted as some kind of concrete grounding requirement, and it is almost certain that predicates such as these are not 'confrontable' in an existence entailing sense. Cocchiarella

[89] Williamson, 2013, p. 314.

argues that 'there are attributes… which 'some' objects possess even at a time when these objects do not exist'.[90] A contingentist would need to be careful about endorsing Cocchiarella's argument here as it comes close to quantifying over the non-existent, but nevertheless it still represents the idea that some predicates might not automatically establish actual existence.[91] I shall leave this consideration for a later section as it revolves around the 'being constraint' that I discuss in more detail further down. The being constraint argues that 'being *F* is being something', and Williamson points to some *F*'s that merely possible things seem to be. What we have established at this point is that if grounding concerns carry metaphysical weight, then the fixed-necessitist must establish the thingness of third mode things in terms of non-modal existence grounding predicates, concrete or no.

To conclude this section, fixed-necessitism, with its actually existing merely possible things, represents the necessitist position with the highest metaphysical stakes. It claims that there are *actually existing* individuals that we were hitherto unaware of. But when trying to ascertain exactly what kind of things these individuals *are* and what actually existing properties they have, we are left with only modal shadows. Without some kind of grounding in actually existent confrontable properties, the metaphysical stakes risk vanishing into terminology. The only remaining justification for positing such things lies in the logical necessity of doing so. This possibility will be explored when I discuss the being constraint. Before then, let us turn to union-necessitism and the way necessitist metaphysics can be understood in that structure.

[90] Cocchiarella, 1969, p. 34.
[91] For instance Kripke, a contingentist, allows non-existent individuals to bear predicates. We discuss his approach in the section on contingentist responses to the being constraint.

Union-necessitist metaphysics and grounding

In the last section we assumed that merely possible things are *actually existent* merely possible things, and thus they have their own existence comparable to 'being abstract' and 'being concrete' within the actual world. However if we read Williamson's explanations in a more cautious manner, it seems that he is hesitant to commit himself to such an understanding. Williamson's use of the term 'possible coin' for instance, may not be a way of predicating the kind of being the thing has but simply a reading of the Barcan Equivalence in use. Where a contingentist might say $\Diamond\exists x\, Cx$, 'it is possible for something to be a coin', Williamson realises that this means we also have $\exists x\, \Diamond Cx$ and describes the formula *as a whole* as 'something is a possible coin'. 'Merely possible things' might then simply be a way of describing those things that have only *modal* concrete predicates, and perhaps some arbitrary logical predicates as well. In this case, named descriptions such as 'a possible *F*' is only a way of singling out one of the thing's modal predicates to represent the *thing in itself*. Presumably then, the 'merely possible pound' is just as legitimately a 'merely possible euro' or even a 'merely possible merely possible merely possible pound'. For any concrete predicate *F* possessed by some *x* in counterfactual circumstances, we would be able to predicate truly $\Diamond Fx$ whether or not *x* is actually concrete. So then, *x* necessarily bears all necessary predicates —such as self-identity— and necessarily possibly bears all contingent predicates, thanks to the B axiom. It also seems reasonable to suppose that for any two distinct individuals *x* and *y* the sum total of their modal predicates would differ, and thus they can theoretically be described in a unique way by this method. If this is the case then the term 'merely possible thing' is better understood as a *modal description* rather than an *actual ascription*.

This interpretation of 'merely possible things' gains weight from the fact that Williamson only logically describes the third mode in negative terms as non-abstract, non-concrete, i.e. $\sim Ax \wedge \sim Cx$, rather than in any positive sense as 'merely possible', *Mx*, or 'third mode' *Tx*. In another place he suggests that these exotic things have the plainest of all modes of being: that of 'being a thing'.[92] Perhaps this is due to the fact that no actual positive mode of being can be predicated to these 'merely possible things'; their mode of being is purely negative and modal. Abstract things are both 'things' *and* 'abstract things', concrete things are both 'things' *and* 'concrete things', while 'merely possible things' are simply 'things' and nothing more. On this reading there are no actual positive predicates that make the thing a 'merely possible thing', it is only the absence of other predicates that does so by default. We might think then of this third mode being, not as a positive category in its own right, but a kind of 'gap' between the positive modes of the abstract and the concrete. The merely possible thing serves as a placeholder for the modal predicates, and by its thingness it trivially bears logically necessary predicates also.

On this interpretation Williamson moves closer to the contingentist than might be thought. 'Nothing' is a negation of the kind 'thing', just as Williamson's 'merely possible thing' is a negation of the kinds 'abstract' and 'concrete'. In both cases it is the default category for that which has no positive predicable existence. Granted, Williamson could say that although the actual mode of being is negatively defined, they are still 'things' in a positive sense, in that they are *quantifiable*: although the claim 'is a thing' is not a predicate within QML, it bears explicit representation via

[92] Williamson, 2013, fn. 28, p. 20.

quantification. This raises the familiar question regarding the grounding of this 'thingness'. It might seem that the fact that merely possible things have no positive mode of being, i.e. they are simply 'things', that their thingness must be primitive, as in trans-necessitism. However, in a union-necessitist structure there is another grounding option. This option would be to say that the thingness of merely possible things is grounded in the fact, not of their own negatively defined actual being, $\sim Ax \wedge \sim Cx$, but in their positively defined modal being, $\Diamond Cx$. They are merely possible things *because* they are possibly concrete. I disallowed this response in the fixed-necessitist case, as that was to equate an actual existing mode of being, the positive predicate Tx, with a modal mode of being, the predicate $\Diamond Cx$. But if 'merely possible thing' is understood as a *modal description* rather than a *positive ascription*, it is not so clearly surreptitious. Merely possible things have no positive predicated mode of being that can be accused of disguising modal content. Now, grounding a negative mode of being in modal positive being naturally leads to a union-necessitist understanding of the metaphysics, since the grounding of being for a merely possible thing is not to be found in this world, but in other worlds. It is a quantifiable thing in this world only because it is thing more substantially, i.e. concretely, in another world. Seemingly then, if it were not a thing in any other circumstances, it would not be a thing in the actual circumstances either. It has no *actual* 'thingness' capable of standing on its own as it were.

This grounding is union-necessitist, since in union-necessitism a thing is a member of U because it was first a member of some D(w), and thus became a member of the union of the set. The set U is not primitive, it is a *derived set*, grounded upon $\cup$D(w). Thus $\Sigma y\ x = y$ represents the derived nature of the thingness of x from its primitive existence elsewhere. Fixed-necessitist $\exists y\, x = y$ does no such thing. It merely points to its own existence that must be simultaneously derived with $\Diamond\exists y\, x = y$, from members of fixed D(w). Another way to see that this is the case is by considering the following. If the 'thingness' of the non-concrete, non-abstract, is grounded in the fact it is possibly concrete, then we ought to be able to claim that x is a thing if and only if x is either abstract or possibly concrete. We can do this in union-necessitism as follows:

1.	$\Sigma y\, x = y \supset \Diamond\exists y\, x = y$	UN valid formula
2.	$\Diamond\exists y\, x = y \supset \Diamond Ex$	Valid formula regarding E in UN
3.	$\Diamond Ex \supset \Diamond(Ax \vee Cx)$	Valid formula regarding E in UN
4.	$\Diamond(Ax \vee Cx) \supset (\Diamond Ax \vee \Diamond Cx)$	Theorem in K
5.	$\Diamond Ax \equiv Ax$	Metaphysical theorem
6.	$(\Diamond Ax \vee \Diamond Cx) \supset (Ax \vee \Diamond Cx)$	Equivalence implication using 5
7.	$\Sigma y\, x = y \supset (Ax \vee \Diamond Cx)$	From 1-6.
8.	$(Ax \vee \Diamond Cx) \supset \Sigma y\, x = y$	As $\Sigma y\, x = y$ is valid in UN
9.	$\Sigma y\, x = y \equiv (Ax \vee \Diamond Cx)$	From 7 and 8.

This derivation is not possible in fixed-necessitism. Although we have $(Ax \vee \Diamond Cx) \supset \exists y\, x = y$ due to the theoremhood of $\exists y\, x = y$, we cannot derive the converse since D(w) is not constructed only from things that must be concrete or abstract in some possible world. In fixed-necessitism, since there are actually existing non-concrete, non-abstract things, it is *possible* that something could be *necessarily* non-concrete and non-abstract, $\Diamond\exists x\, \Box({\sim}Ax \wedge {\sim}Cx)$. This spells disaster as:

1.	$\Diamond\exists x\, \Box({\sim}Ax \wedge {\sim}Cx) \supset \exists x\, \Diamond\Box({\sim}Ax \wedge {\sim}Cx)$	Barcan Formula
2.	$\exists x\, \Diamond\Box({\sim}Ax \wedge {\sim}Cx) \supset \exists x\, \Box({\sim}Ax \wedge {\sim}Cx)$	S_5 valid.

$\exists x\ \Box(\sim Ax \wedge \sim Cx)$ is clearly incompatible with $\exists y\ x = y \supset (Ax \vee \Diamond Cx)$. Of course a fixed-necessitist could add the axiom $\sim\exists x\ \Box(\sim Ax \wedge \sim Cx)$, but that is equivalent to the axiom $\forall x\ \Diamond(Ax \vee Cx)$ and thus makes the grounding axiomatic within fixed-necessitism, rather than derivable from the logical structure. Intuitively, the metaphysical concept of grounding requires the derivation of that which requires grounding from the pre-existing ground of its being. An axiom represents no such relationship of derivation.

Union-necessitism is thus capable of satisfying our grounding intuitions in a way that fixed-necessitism cannot, and trans-necessitism explicitly rejects. In such a structure it is possible to establish that everything is grounded in the concrete —assuming that abstract individuals can be so grounded. It also verifies the necessitist maxim 'necessarily everything is necessarily something'. However, in this structure merely possible things do not actually exist. They can be evaluated and quantified at the actual world, but they do not actually exist in the actual world. The union-necessitist *does* claim that merely possible things are (broadly speaking) something, even though they are a non-existent something. Now it would appear that this is a point of disagreement with contingentists, as contingentists state that they are nothing. But as we have seen, this is not so clear, since the logical structure is the same, and both would agree that $\sim\exists y\ x = y$ is true regarding merely possible x's, i.e. that x is (contingently speaking) nothing. The difference is that union-necessitists endorse $\Box\Lambda x\ \Box\Sigma y\ x = y$, which contingentists would naturally translate (in S_5) to $\Box\forall x\ \Diamond\exists y\ @\ x = y$.[93] Depending on the contingentist, she or he may or may not endorse this claim. We explore the ways contingentists think predication works in terms of the

[93] This translation is based on the idea that Σx can be rendered $\Diamond\exists x\ @$ and Λx can be rendered $\Box\forall x\ @$ inside contingentist logic.

non-existent when discussing the being constraint. As regards the stakes, there are no ontological stakes at play; there is only the potential for stakes in terms of expressive power and complexity of quantification.

Trans-necessitist metaphysics and grounding

Trans-necessitism treats all ‘things’ as primitive. Nothing makes a thing a thing. In trans-necessitism, even more than in fixed-necessitism, the term ‘merely possible thing’ is unhelpful. In trans-necessitism things are inherently non-modal, i.e. non-actual and non-possible. Modality applies only to predicates. Due to this let us use the generic term ‘third mode thing’ to represent the non-concrete, non-abstract contentious things. In a sense trans-necessitism is similar to fixed-necessitism in claiming that ‘third mode things’ have a mode of being no different to concrete and abstract things. It is also similar to union-necessitism in the sense that ‘third mode things’ are neither actual nor existent. But both of these similarities require further elaboration.

Whereas fixed-necessitism requires applying a third mode of being predicate to ‘merely possible things’ to justify their bona fide ‘thingness’ alongside abstract and concrete things, trans-necessitism does the reverse. Trans-necessitists relegate the predicates ‘concrete’ and ‘abstract’ to derivative, non-fundamental, sets of predicates. Paradigmatic concrete and abstract predicates serve as the yardstick of inclusion into these sets, i.e. $Fx \supset Cx$ for the set of concrete implying predicates F, and $Gx \supset Ax$ for the set of abstract implying predicates G. This suggests that ‘being abstract’ or ‘being concrete’ is a predicate that functions as an adjective that describes the sum total of predicates applicable to the individual, not to *the thing in itself* as it *actually is*. In a sense the thing has a predicate bearing projection into the world of reference without *itself* being present there. Thus, if it is the case that abstract things are necessarily abstract, that is only so in a derived sense due to the fact that the set of *G* predicates that make it an abstract thing are all necessary predicates, i.e. $Gx \supset \Box Gx$. Our predicate groupings have determined that we use the term 'abstract things' to refer to things that necessarily have an abstract projection in all worlds. With this understanding, it is not difficult for a new set of predicates to determine that a thing is 'third mode'. This set can be defined negatively such as $\sim Fx \wedge \sim Gx \supset Tx$ or $\sim Ex \supset Tx$ where *Ex* is also defined as $Ax \vee Cx \supset Ex$; or it could be defined modally such as $\Diamond Fx \wedge \sim Fx \supset Tx$. We could potentially divide things into various *other* categories according to our purposes, but each would represent a claim regarding the kind of predicates these individual bear, not regarding the kind of thing it is *in itself*, in a way that goes beyond predicates. *In themselves*, things do not bear predicates, they only link together sets of predicates between worlds from their trans-world position. Additionally, in trans-necessitism quantified logic is not subservient to modal logic; it refuses to make one primitive over the other. There need be neither a set of worlds, W, nor an application of predicates V, in order for there to be a set of things, D.

When it comes to establishing the grounding of things, it is clear that trans-necessitism rejects the idea that things are grounded. The claim that things are primitive is the claim that they are *not* grounded in any predicate, self-identity or otherwise. Rather than viewing this as a rejection of our intuitions regarding the grounding of thingness, it should better be regarded as a claim that our intuition regarding grounding is *epistemic* in nature, rather than *metaphysical*. Metaphysically things are not grounded in predicates, although we come to *know about* things via interaction with their predicates. Cocchiarella's claims regarding the 'confrontability' of certain predicates that result in separating out the existent from the non-existent can be interpreted in a trans-necessitist way as an epistemic claim regarding predicable 'modes of existence'. Perhaps our suspicion that third mode things are nothing is due, not to the fact of their metaphysical nothingness, but due to the fact that these things bear no 'confrontable' predicates in the actual world. Thus the contingentist intuition that 'if this coin were not minted it would be nothing' is translated into 'if this coin were not minted it would not exist'. This suggests that what Williamson argues is a 'merely possible thing' should better be understood as a 'non-existent thing'. What is certain is that the term 'merely possible thing' is unsuited to the role it is required to play in trans-necessitism since things in themselves have nothing to do with modality.

Trans-necessitism presents an unusual approach to modality, and one with high metaphysical stakes, although not regarding the world of predicates, nor regarding what 'exists'. Predication remains unchanged. In fact, as we shall see in the next sections regarding the being constraint, the detachment of individuals from both their predicates and world location enables far greater strength in terms of expression. Although trans-necessitism is technically a necessitist position, categorising it as such is to miss the point. It is more substantially a structure that separates quantification from modality entirely. Thus 'necessarily everything is necessarily something' is true in trans-necessitism in the same trivial way that 'necessarily every world is necessarily some world' is true in other modal structures. The metaphysical shock primarily relates to its claims regarding grounding, existence and being. Trans-necessitism claims that existence and being are not fundamental properties of things, but contingent qualities that express our epistemic process and limits. When we predicate of a thing, we are more correctly adding a predicate to a set of predicates associated with that thing at some world. Predicates are true 'at that individual', in a similar way to the way they are true ‘at that world’. The strength of this approach to modal logic will demonstrate itself most fully when considering the being constraint. The topic I turn to next.

The being constraint

Informally, the being constraint says that if *x* has properties, then *x* must be something. Nothing cannot be red, nor desired, nor self-identical. Nothing does not have describable constituents either, nor can we say anything true about some 'part' of nothing; it is completely and utterly *nothing*. Williamson states that the being constraint is 'deeply plausible': 'How could a thing be propertied were there no such thing to be propertied? How could one thing be related to another were there no such things to be related?'[94] The metaphysical idea behind the being constraint is that the thing is required in order to instantiate the property; the state of the thing is the truth-maker of the claim.

Formally, at least for contingentists, fixed- and trans-necessitists, the being constraint can be represented by the schemas:

BC1 $Fx \supset \exists z\, x = z$ for all one-place predicates F

BC2 $Rxy \supset (\exists z\, x = z \wedge \exists z\, y = z)$ for all two-place predicates R.

BC1 represents the being constraint for intrinsic properties (if *x* is *F* then *x* is something), while **BC2** represents it for relational properties (if *x* relates to *y*, then both *x* and *y* are something). There would be equivalent theorems for all *n*-placed predicates, but these two suffice for our purposes. From the theoremhood of **BC1** we can derive $\Box(Fx \supset \exists z\, x = z)$ by necessitation, also since this is a theorem we can derive $\forall x\, \Box(Fx \supset \exists z\, x = z)$ and then $\Box\forall x\, \Box(Fx \supset \exists z\, x = z)$. Let us call this, and its relational equivalent, the positive being constraint:

[94] Williamson, 2013, p. 148.

PBC1 $\Box\forall x\, \Box(Fx \supset \exists z\, x = z)$

PBC2 $\Box\forall x\forall y\, \Box(Rxy \supset (\exists z\, x = z \wedge \exists z\, y = z))$.

PBC1 says that 'necessarily everything is necessarily, if a bearer of a property, something'. For fixed- and trans-necessitists **BC1**, **BC2**, **PBC1** and **PBC2** are trivial; $\exists z\, x = z$ '*x* is something' is a theorem of fixed- and trans-necessitism. Contingentists, however, need to be careful, as **BC1** is a genuine constraint for them. In free logic, **BC1** would mean that V could only assign predicates to individuals within the domain of the world, as to assign predicates to an individual outside of the domain of the world would result in **BC1** being violated. That is fine as long as a contingentist has no need to predicate of an individual in a world in which it is not in the domain. Williamson thinks there are cases in which it is difficult for a contingentist to withhold predicating of individuals outside the domain of that world. We examine specific cases in a later section. Before that, let us consider how a union-necessitist might formalise the being constraint.

Fixed-necessitists and contingentists agree that 'to be something is to exist', and so the being constraint can be naturally understood as the need to predicate of 'existent things'. For union-necessitists, though, there is an initial decision to make. Is the intuitive pull of the being constraint that predicating is predicting of something, or that predicating is predicating of actual existence? In the first case a union-necessitist can formulate the being constraint as **BCt** $Fx \supset \Sigma z\, x = z$, which, as in the case above, is trivial; $\Sigma z\, x = z$ is a theorem of union-necessitism. In the second case a union-necessitist would formulate the being constraint exactly as above, $Fx \supset \exists z\, x = z$, and be in the same boat as the contingentist regarding the restriction this places on V. In practice the decision is not likely to be a cut and dry affair for union-necessitists. The motivation for taking a union-necessitist position is that a broad understanding of predication requires a broader concept of 'something' than allowed by our initial intuitions. However, since a union-necessitist typically values our intuitive concept of thingness, he or she separates intuitively existent things, from things more broadly conceived. Both of these conceptions are metaphysically fundamental enough to be quantifiable separately, and thus making use of one quantifier rather than the other makes a different claim, ranging over a different set of things. That being the case a union-necessitist would unflinchingly endorse **BCt**, allowing the concept of predication to be taken in its broadest form. However, when taking *F* in a restricted sense, as ranging over only *some* predicates, a union-necessitist could endorse **BC1** as it stands. Perhaps the union-necessitist agrees with fixed-necessitists that 'nothing cannot be red, nor desired, nor self-identical'; but might add that 'non-existent things cannot be red, although they can be self-identical, and could perhaps even be desired'. Cocchiarella follows this metaphysical line, although he takes the predicates themselves to be more fundamental than the domain of existing things:[95]

> *'Mere possession of an attribute is not enough [to exist] since objects... possess many attributes… even though they do not exist. Possession of an e-attribute, however, is quite another matter, since such possession entails existence… possession of these special attributes constitutes the… ground for our distinguishing what exists from what does not'.*[96]

[95] See Cocchiarella, 1969. Although I use Cocchiarella as an example of a union-necessitist, the fundamental nature of the 'e-predicates' (described as 'confrontable' in previous sections) in Cocchiarella's metaphysics could perhaps be better accommodated within a trans-necessitist structure. Beginning with a model <W, R, D, D(*w*), V> where D is primitive rather than D(*w*), we define D(*w*) based on V according to the individuals at world *w* that are assigned predicates from a sub-set of e-predicates. Thus thingness is primitive, D, and restricted quantification over existent things is a derived quantification over a subset of individuals, D(*w*), that bear certain predicates at that world based on V(*E*). This maintains the *derived* nature of V(*E*) from other predicates, unlike union-necessitism.
[96] Cocchiarella, 1969, p. 46.

The union-necessitist, then, might respond to some cases by claiming that the predicates concerned are not existence entailing and thus satisfy only the trivial **BCt**, although certain paradigmatic existence entailing substitutions for a predicate may be required to satisfy the more restrictive **BC1**. Union-necessitists also have a direct way of expressing our metaphysical intuition that for some predicates *F*, 'to be *F* is to exist'. The cost of this position is that —in addition to the added complexity of two domains, two kinds of predicate, and two quantifiers— it has its own metaphysical strangeness: we can make true statements about things that do not exist.

Parallel to the being constraint, we could formulate its negative variant: if *x does not* have properties, then *x* must be something. Nothing cannot be not red, nor not desired, nor not self-identical. Cresswell makes this argument, claiming that 'if *x fails* to be *F* in *w* then, in order to give *sense* to the claim that it is *x* and not something else which fails to be *F* in *w*, *x* must be something in *w*.'[97] Again, the idea is that the thing is required in order to *not* instantiate the property; it is the state of the thing that becomes the truth-maker of the claim it is *not F*. We formally describe the negative being constraint as follows:

NBC1 $\Box\forall x\, \Box(\sim Fx \supset \exists z\, x = z)$ for all one-place predicates *F*

NBC2 $\Box\forall x\forall y\, \Box(\sim Rxy \supset (\exists z\, x = z \wedge \exists z\, y = z))$ for two-place predicates *R*.

The union-necessitist also has its own variant for cases in which the predicate is not existence entailing: **NBCt1** $\Box\forall x\, \Box(\sim Fx \supset \Sigma z\, x = z)$ and similar for **NBCt2**.

[97] Cresswell, 2013, p. 335.

The nature of the relationship between **PBC** and **NBC** is both interesting and controversial. We shall follow the various approaches to **PBC** and **NBC**, and their impact on the metaphysical positions in the coming sections.

Contingentist troubles with the being constraint

Kripke, a contingentist, decided against endorsing **PBC** since he felt that **NBC** was a substitution instance of **PBC** —where ~*Fx* is substituted for *Fx*— and that would result in the requirement that he accept both. Then, on a typical logical assumption of *bivalence* —that for any predicate *F* and any individual *x*, either *Fx* or ~*Fx*— one of **PBC** or **NBC** must apply to everything. But if **PBC** $Fx \supset \exists y\, x = y$, and **NBC** $\sim Fx \supset \exists y\, x = y$, and bivalence $Fx \vee \sim Fx$, then we have $\exists y\, x = y$ '*x* is something' as a theorem. If $\exists y\, x = y$ is a theorem of free logic then the domains of each world *w* must match the domain of the variance of the free variable *x*, i.e. the world domains would have to be constant and we get fixed-necessitism. Union-necessitists can endorse their own versions **PBCt** and **NBCt**, and derive the parallel necessitist theorem acceptable to them: $\Sigma y\, x = y$. Trans-necessitists, like fixed-necessitists, view **PBC** and **NBC** as trivial and accept bivalence; thus $\exists y\, x = y$ is a theorem but without the usual free logic implications regarding existence and actuality. Contingentists, however, need to reject or restrict **PBC**, **NBC** or bivalence to avoid unacceptable necessitist conclusions. Arthur Prior took the route of rejecting bivalence. In his logical system, entitled Q, if *x* did not exist, then it was neither true nor false that *x* was *F*. Williamson describes some of the logical strangeness that results from rejecting bivalence, such as the non-equivalence of □ and ~◇~, and the difficulties involved with differentiating instances of contradictions from contingent falsities.[98] Williamson concludes by stating that, 'Technically, Q is a mess… For such reasons, philosophers and logicians

[98] Prior's logic can be found in Prior, 1957, and Priest, 2008; Williamson discusses some of the problems with Prior's logic in 2013, pp. 64-71.

have largely abandoned Q'.[99] With this option ruled out, contingentists must either reject **PBC** *and* **NBC**, or reject **NBC** but maintain **PBC**.[100]

In addition to Kripke's concern that **PBC** and **NBC** must be taken or rejected together as substitution instances of each other, Cresswell argues that even if **NBC** is not a substitution instance of **PBC**, they ought to be taken as a pair since the justification for **PBC** is equally applicable to **NBC**. **PBC** is partially justified on the basis that without the subject '*x*' being something, there is nothing to serve as the truth-maker for the claim that '*x* is *F*'. Equally **NBC** can be justified on the basis that without the subject '*x*' being something, there is nothing to serve as the truth-maker for the claim that 'it is not the case that *x* is *F*'. Thus it need not be the case that **NBC** is justified on the basis that it is a *substitution instance* of **PBC**, but that it is justified in its own right by being a highly intuitive metaphysical principle. If either Kripke's or Cresswell's claims hold weight, contingentists are only left with the option of rejecting both **PBC** and **NBC**.

Bivalence means that Kripke accepts that V must assign non-existent *x*'s to either *F* or ~*F* in each and every world.[101] Presumably, *metaphysical* considerations result in V assigning non-existent *x*'s to ~*F* in all cases of *F* predicates that relate only to existent individuals, but there is nothing *illogical* about non-existent *x*'s bearing positive predicates of any kind in Kripke's system. In fact, in order to invalidate **PBC**, there must be some *F* that a non-existent *x* *does* bear in some possible world. This allows formulae such as $Fx \wedge {\sim}Ex$ '*x* is *F* and *x* does not exist' to be true, and similarly $Fx \wedge$

[99] Williamson, 2013, p.71.
[100] The other option of rejecting **PBC** but maintaining **NBC** would have no metaphysical motivation in the context discussed, and so is not considered.
[101] More correctly, V must either assign or not assign *x* to *F*, assuming that ~ is defined as is logically typical.

$\sim\exists y\ x = y$ '*x* is *F* and *x* is nothing' to be true. Kripke's position logically allows that *x* can be whatever we wish to predicate of it without thereby being something. It *does* mean however that since the quantifiers range only over the world domains, that these 'nothing' individuals with their instantiated predicates cannot be quantified over by $\exists$ or $\forall$. Williamson argues that Kripke's position comes at a major metaphysical price. How could it be true to say that *x* is *F* if *x* does not exist, or of greater concern, if *x* is *nothing*? Also, if *x* does not exist but is *F*, what is it that makes it true that *x* is *F*, and false that *x* is not *F* i.e. what is the truth-maker of the claim if the claim is *about nothing*? A special example of this might be the identity principle. Without **PBC** a contingentist can maintain **I1** $x = x$ for all variables and constants as a theorem without it implying that *x* is something. But then we can derive $\Box\forall x\ \Box\ x = x$, 'necessarily everything is necessarily itself'. This might not be **NNE**, but it has a necessitist tone about it, e.g. 'this coin is necessarily this coin'. On the other hand rejecting **I1**, as a Kripkean contingentist, seems arbitrary. If 'nothing' can be *F*, why can it not be itself? As Williamson points out: 'self-identity is as easy a property as any to have'.[102] A second issue that Williamson raises with Kripke's position regards the implications of unrestricted predication when combined with restricted quantification: it seems to be the case that *x* can be *F*, and yet nothing is *F*, i.e. $Fx \wedge \sim\exists x\ Fx$ is not a contradiction.[103] Perhaps a contingentist might respond by suggesting a counter-example *F* such that it is possible for *x* to be *F* while still being nothing, and thus it is acceptable for *x* to be *F* and nothing to be *F*. In such a case Williamson replies that the contingentist has 'failed to grasp how radical is the nothingness

[102] Williamson, 2013, p. 153.
[103] Although Williamson's complaint here is phrased inside a metaphysical context, the issue is a re-emergence of the one regarding existential generalisation. If $Fx \supset \exists x\ Fx$ was a theorem, then it would be an atomic instance of **EG** prior to the free logic adjustment that makes the atomic case **EG*** $Fx \supset (Ex \supset \exists x\ Fx)$.

required of counterexamples to the being constraint'.[104] It is this kind of 'wholehearted contingentism' that Williamson states is under consideration.[105]

This demand Williamson makes of contingentists regarding the 'radical nothingness' required of counter-examples seems to be another occasion in which he demands an exclusively 'unrestricted' concept of thingness, and thus demands a corresponding 'absolute nothingness' to act as the negation. If we allow, as Williamson does in his metaphysics, the term 'things' to serve as the most general term for quantifiable individuals, covering even the extremely exotic and discounting only absolute unnameable nothingness, then the being constraint seems to trivially follow. Counter-examples are ruled out *by definition*, since a counterexample must involve some form of reference to a counterexample individual. Williamson's 'hard case for contingentists' example shows that this complaint is justified. In it he asks us to imagine a counterfactual scenario in which some actual knife had not been assembled although its blade and handle parts were still existent. In that situation he says that although the complete knife is, according to a contingentist, nothing 'could it not still have the property (in a liberal sense) of being referred to, for example, as the possible knife that would have been made of that blade and that handle?' Williamson suggests that should a contingentist agree they risk disaster, as the uniquely denoting description must single out 'something'.[106] It seems as though Williamson returns here to the logical idea of **PN** $\exists x\ k = x$, 'naming is naming something', in a metaphysical context. That is not to make Williamson's claim trivial as it points out another context within which we have a broad understanding of what a 'thing'

[104] Williamson, 2013, p. 156.
[105] Ibid. pp. 148-156.
[106] Ibid. p. 149.

includes; so broad as to require the necessary existence of anything we can name or describe. In the next section I will examine two case studies that act as good counterexamples to the being constraint, as I believe rejecting the being constraint is the appropriate response for contingentists. They are not counterexamples in the typical sense, since Williamson's restrictions forbid the usual approach. They are counterexamples because they examine predicate cases that cannot be accounted for inside QML, whether free *or* classical; thus they demonstrate that free logic based necessitism is not the solution to the being constraint it appears to be. Instead they suggest an adjustment to QML structure that most naturally suits a trans-necessitist interpretation.

The other option for contingentists, the one suggested by Williamson, is to accept **PBC** and reject **NBC**. Williamson argues that Kripke was wrong to assume that ~*Fx* is a substitution instance of a general predicate *Fx*. Williamson claims that ~*Fx* has 'internal complexity' and can be read in one of two ways: (~*F*)*x* or ~(*Fx*). The first reading, (~*F*)*x*, says that '*x* is a not-*F*', while the second reading, ~(*Fx*) says that 'it is not the case that *x* is an *F*'. As an example he considers the difference between claiming that someone is single, and claiming that someone is not married. In the first case the claim is a positive claim regarding the application of the 'not-married' predicate, while the second is a negative claim that withholds the application of the 'married' predicate. In typical circumstances, the subject of a claim will either be 'married' or 'not-married', i.e. concretely existing people must be either married or single, however when it comes to claims regarding 'nothing' it is possible for nothing to be both not 'married' as well as not 'not-married'. They can be nothing.[107] In order

[107] Williamson, 2013, pp. 157-158.

to allow for a logical distinction between the cases without violating bivalence or double negation, Williamson outlines an adjustment in logic put forward by Robert Stalnaker.[108] The adjustment involves adding a new predicate operator λ, and distinguishing between $\lambda y(\sim My)x$ read as 'it is the case concerning x that x is not-married' as a complex predicate of being (positively) not married, and a straight negation of a predicate $\sim Mx$ read as 'it is not the case that x is married'. For our present purposes we can differentiate the two kinds in terms of $(\sim F)x$, and $\sim Fx$. Williamson argues that $(\sim F)x$ is a legitimate substitution instance for Fx, since it positively applies the not-F predicate to x, and thus requires x to be something capable of bearing a predicate. He then argues that $\sim Fx$ is *not* a substitution instance, since it simply withholds the predication of F to x, and so does not require x to be something capable of bearing a predicate. Williamson claims that this distinction legitimately allows a contingentist to endorse **PBC**, on the grounds that predicating of x requires x to be something, without needing to similarly endorse **NBC**, since it can be true regarding these 'nothing' individuals that $\sim Fx$ for all predicates F. As a result it is possible to withhold predication entirely regarding variables that are 'nothing' in a given world, without thereby falling into predicating the negation of those predicates. Thus one can hold **PBC** and remain a contingentist.

Taking the route Stalnaker does in distinguishing between positively bearing a 'negative predicate' and not bearing a 'positive predicate' results in some strangeness for the metaphysical debate at hand. If **PBC** is accepted, then if x is nothing then $\sim Fx$ for all predicates F. Now consider the E predicate. It is a theorem of free logic that $\forall x$

[108] The original arguments can be found in Stalnaker, 2003. Williamson's discussion is found in 2013, pp. 159-172.

Ex, and so for all 'things' we have Ex and for all 'nothings' we have $\sim Ex$. But there must also, by Stalnaker's reckoning, be a way of positively predicating 'negative existence' on to a thing: $(\sim E)x$ 'x is not-existent'. Now, by **PBC** if $(\sim E)x$ were true for any x, then x would be something, and thus exist and we would have $(\sim E)x \wedge Ex$, which is a contradiction. Therefore $\sim(\sim E)x$ is a theorem of free logic with Stalnaker's distinction in place. On a natural metaphysical reading of this theorem we get 'it is not the case that x is not-existent' for every assignable individual x, whether they are 'something' or 'nothing'. That leaves contingentists in the difficult position that they cannot claim that this particular thing is (in a positive ascription sense) 'nothing'; worse, they must concede that the idea of x being 'non-existent' is a contradiction. But when a contingentist claims 'if this coin were not minted it would not exist' it seems to be an instance of positively predicating non-existence to this coin in counterfactual circumstances, i.e. $\Diamond(\sim E)x$. Attempts to get around this by changing the positive metaphysical claim 'x is nothing' to a nuanced withholding equivalent of 'x is not a thing' also risks danger. If it were the case that 'x is not a thing' then by **PBC** it is the case that 'x bears no predicates' since $\sim\exists z\, x = z \supset \sim Fx$ for all predicates F is equivalent to **PBC**. But does it not thereby bear the predicate 'bears no predicates'? It certainly seems to be a positive claim regarding these 'not a thing's. Of course it cannot bear *that* predicate without contradiction, which suggests that x must bear a predicate of some kind, and thus be something by **PBC**. Otherwise the **PBC** contingentist must explain how they can both claim that x is 'not a thing' as it bears no predicates and yet does not bear 'bears no predicates'. Stalnaker's approach also requires adjustments to the identity principle, **I1** $x = x$. If the **PBC** is maintained then $\Box\forall x \Box\, x = x \supset \Box\forall x \Box\exists y\, x = y$, and thus we get **NNE**. Rejecting **I1** means that $\exists x \Diamond \sim x = x$, 'something is possibly not itself' is true for concrete x's; particular cases include ‘this coin is possibly not this coin’ and ‘Stalnaker is possibly not Stalnaker’. This is certainly a strange metaphysical consequence.

Williamson’s concern with Stalnaker’s logic is not what we have just discussed. The added operator and change in predication requires a new axiomatic basis for quantified modal logic; one Williamson criticises for the increase in complexity required simply in order to avoid necessitist metaphysics: ‘If they [contingentists] introduce the λ operator, they still slide into necessitism unless they complicate its logic in awkward ways.’[109] Since Williamson prizes simplicity in his logical theorems, he simply suggests the price is not worth paying.

[109] Williamson, 2013, p. 188.

Being constraint case studies

To demonstrate the effects of the being constraint —whether accepted or not— on each position I introduce two case studies. The first is the legendary case of Juan Ponce de Leon searching for the Fountain of Youth. Whether or not the legend is true, it serves as a vivid example of a case in which someone searches for something that does not 'exist' —at least not in the way Ponce de Leon thought it did. The **PBC** says that since Ponce de Leon searches for the fountain of youth, Ponce de Leon must be something and the fountain of youth must be something. This example causes problems for contingentists that wish to maintain the **PBC**, since if they accept things such as the fountain of youth as something then they lose much of the metaphysical justification for supporting contingent being. The fountain of youth is the kind of thing that contingentists typically want to say *is nothing*.[110] This case study thus provides further evidence that contingentists are better off rejecting **PBC**. A fixed-necessitist however thinks that **PBC** can be upheld in this example since the fountain of youth *is* something: it is an actually existent merely possible fountain. But I have chosen this particular scenario because in this case the fixed-necessitist response is not the solution it appears to be. Ponce de Leon *does not* search for a merely possible non-concrete fountain of youth, but a concrete fountain of youth with concrete properties. If Ponce de Leon had been convinced by a fixed-necessitist of the existence of actual merely possible things, he would say that he is not searching for

[110] There may be ways for contingentists to defend the position that claims Ponce de Leon searches for an actually existent 'idea' or 'concept', rather than a concrete fountain. This way they can still hold **PBC**. This response suffers from the same problems that plague fixed-necessitist responses that I discuss in this section. The problem is not one isolated just to relational predicates either. Contingentists cannot endorse **PBC1** without **PBC2**, since an instance of **PBC2** leads to an instance of **PBC1**. If Ponce searches for the fountain —a relational predicate— then the fountain 'is sought after' —a passive single predicate.

any such thing, since it would not be the kind of thing he could search for, nor hold any value for anyone who could theoretically find one. Whatever Ponce de Leon searches for, it is certainly not *that*. In fact, the fixed-necessitist cannot even say that the thing that Ponce de Leon searches for is a fountain of youth, since the merely possible fountain of youth is not a fountain of youth, just as a merely possible coin is not a coin. The features of the fountain of youth that make it the object of Ponce's search are held by the merely possible fountain, not as actual properties, but only as possible properties. Ponce thinks that the x he seeks can grant eternal life, ELx, when in actuality it only possibly has the property of granting eternal life, $\Diamond ELx$. The fixed-necessitist might argue that although Ponce de Leon may be mistaken about the properties of the object he seeks, since he seeks, he must be seeking something. On what basis then could the fixed-necessitist claim that what Ponce de Leon searches for is an actually existent merely possible fountain of youth rather than nothing? A fixed-necessitist might respond that although Ponce de Leon does not search for the merely possible fountain as it *actually is*, he does search for it as it *could possibly be*; so by its rigid de re association with the actually existent merely possible fountain of youth, Ponce de Leon *does* seek the merely possible fountain as an individual, i.e. it is the *thing in itself* that he seeks.

The logical motivation for this response is the **PBC** instance of $(Px \wedge Sxy) \supset \exists z\, y = z$ 'x is Ponce and x searches for y implies that y is something' and since $\exists$ ranges over actually existing things there must be some actually existent y that is sought. That y is, presumably, best understood as the object that could be what Ponce hopes *it is*, i.e. the actually existent merely possible fountain that can be quantified over by $\exists$ to satisfy the **PBC**. This being the case, V assigns the ordered pair of individuals <Ponce, Fountain> to the predicate *S* at the world of evaluation, and in the interesting case ϕ assigns *x* to Ponce and *y* to the Fountain. When fixed-necessitist metaphysics gets applied, V also assigns <Fountain> to the third mode predicate *T*, and does not assign it to the concrete predicate *C*. But here is the problem. It also seems true that Ponce *does not* seek the fountain as the merely possible '*T*' individual it actually is. Thus it also seems true that V *does not* assign <Ponce, Fountain> to the predicate *S*, which is a contradiction. Ponce cannot both seek and not seek the actually existent merely possible fountain. Thus the fixed-necessitist solution to the being constraint in the case of Ponce results in contradiction.

The contingentist response that claims that Ponce seeks 'nothing' seems intuitively preferable to the fixed-necessitist response that he both seeks and does not seek an actually existent merely possible thing. Once the **PBC** is rejected, a contingentist can describe it this way: $Px \wedge Fy \wedge Sxy \wedge {\sim}\exists z\, y = z$, '*x* is Ponce, *y* is a fountain of youth, *x* seeks *y*, but *y* is nothing/does not exist'. In so doing a contingentist puts forward the case of Ponce and the fountain as a counter-example to the being constraint. Williamson's complaint that such a contingentist fails to appreciate the 'radical nothingness required' is only to insist that the contingentist uses the term 'nothing' as he does. Presumably by 'radical nothingness' Williamson has in mind a necessary nothingness and thus insists that if *x* is nothing then it is necessarily nothing, i.e. ${\sim}\exists y\, x = y \supset \Box{\sim}\exists y\, x = y$.[111] However, a contingentist that puts forward a contingent 'something' quantifier $\exists$, must be allowed a similarly contingent 'nothing' ${\sim}\exists$. We intuit that the fountain of youth is nothing, not that it is necessarily nothing. A

[111] So phrased it is seen as begging necessitist quantification in Kripkean modal logic.

contingentist can justify rejecting **PBC** metaphysically by claiming that our intuitions regarding the need for predication onto a 'thing' is an intuition regarding the impossibility of predicating on to a 'necessary nothing' not merely a 'contingent nothing'; and contingentists do not need to predicate on to *necessary nothing*. But here another problem surfaces. If y is contingently nothing —i.e. actually nothing— how is it *actually* a fountain of youth? Sxy 'being sought' might not require the existence of the sought object but Fy 'being a fountain of youth' seems as though it ought to. If y is *actually* a fountain of youth then it should *actually* exist, if it does not *actually* exist then how is it *actually* a fountain of youth? Perhaps our contingentist rephrases the situation to $Px \wedge \Diamond Fy \wedge Sxy \wedge {\sim}\exists z\, y = z$, '$x$ is Ponce, it is possible for y to be the fountain of youth, x seeks y, but y is nothing/does not exist', i.e. the contingentist states that Ponce seeks a non-existent object that is possibly the fountain of youth. Since y is not actually a fountain of youth, then due to bivalence we must have ${\sim}Fy$ and so, as with fixed-necessitism, Ponce does not actually seek y, and we reach the same contradiction with the function V: Ponce both actually seeks and does not actually seek contingently nothing y.[112]

One escape for the contingentist is to embrace the Kripkean freedom regarding the detachment of predication from existence fully, and claim that Ponce seeks an actual fountain of youth, but unfortunately for Ponce, it does not exist i.e. accept the original formulation: $Px \wedge Fy \wedge Sxy \wedge {\sim}\exists z\, y = z$. In this understanding y is both a fountain of youth, and does not exist. This may seem wrong also: Ponce does not seek a *non-existent* fountain of youth he seeks an *existent* fountain of youth. The straightforward reply is that Ponce might *think* he is seeking an existent fountain of youth, but what he

[112] The same problem occurs if the contingentist refuses to predicate anything to the sought thing y. In this case it is true that ${\sim}Fy$, and so Ponce does not seek y.

is really seeking is a sum total of predicates that actually apply to nothing; there is no underlying actual 'thing' that binds those predicates together, and that is what the formula, as a whole, represents. But now the difference between the fixed-necessitist and the contingentist is hollow. The Kripkean contingentist can predicate concreteness to the fountain alongside all its other sought for predicates but deny it existence and thingness, while the fixed-necessitist can grant it existence and thingness alongside all its other sought for predicates but deny it concreteness. Neither seem ideal, and neither seem preferable.

Union-necessitism initially offers some hope. It allows us to quantify beyond worlds, and what we require to solve the problem is a way of saying that what Ponce seeks is the fountain as it possibly could be, rather than as it actually is. Perhaps then we might consider $Px \wedge \Sigma y\ (\Diamond Fy \wedge Sxy \wedge \sim\exists z\ y = z)$ '*x* is Ponce and there is some non-existent, but possibly existent *y* that is possibly the fountain of youth and is sought by *x*'. This phrasing does not violate the being constraint and seems to be getting closer to what is intuitively occurring. The sought thing *y* is in the scope of the Σ quantifier that ranges not over actual things but things that exist in some possible world. But a technical problem remains. Although the *y* in *Sxy* is an individual in the union of the domains rather than an actual *y* in D(*w*), it is evaluated according to V as it applies to the *actual world*. For *Sxy* to be true it must be the case that <Ponce, Fountain> ∈ V(*S*) at the actual world. The problem is not immediately obvious, but it is the same as with contingentism. Ponce does not seek the actual fountain and so V(*S*) must also *not* assign <Ponce, Fountain> to *S* in the actual world. In the union-necessitist case it is not such an obvious problem, since it does not appear to be claiming that what Ponce seeks is actual in the semantics of Σ*y Sxy*; but the logical structure of V makes it so that it *is* an actual *y* that is sought, despite the Σ quantifier. To make the point clear I turn to a second case study.[113]

Imagine that Smith goes into a pet shop to purchase a cat. As she approaches the selection, one of the cats comes up to her, and she begins to pet it. The cat has lovely fur, and a wonderful personality, although its eyes are a rather unappealing yellow colour. Smith then spots another cat with arresting blue eyes. However, when she moves toward the second cat, it hisses and scratches at her. Smith thinks to herself, 'I wish the first cat had the same colour eyes as the second cat'.

In this case study, Smith desires a cat that is identical to the first one but under counterfactual circumstances in which it has the eye colour of the second. Desire is a predicate that often relates to counterfactual circumstances. I have chosen this example because it is particularly clear that Smith *does not* desire the first cat as it *actually is*, but *does* desire the first cat as it *could counterfactually be*. On a standard assumption of the essentiality of origins we would typically say that the *x* that is desired counterfactually, actually exists in the form of the first cat.[114] This example makes the contradictory issues particularly salient. Consider now the union-necessitist formula $Sx \wedge \Sigma y\ (\Diamond By \wedge Dxy \wedge FCy)$ '*x* is Smith and there is some possibly existent *y* that is possibly blue-eyed and is desired by *x* and is actually the first cat'. In this case the desired thing is not actually non-existent as in the case with Ponce, it is actually existent in the form of the first cat. To make it true that *Dxy* we must have <Smith,

[113] This second case study also demonstrates that it is not possible to simply claim that despite appearances Ponce *does* seek the actual *y*, and thus that the contradiction does not arise.
[114] If this is disputed then the situation could be altered to another in which an actually existent thing is not desired, but is desired *by* an actual thing under some possible change of circumstance. To deny any such scenario occurs is to severely undermine the entire enterprise of modal speak.

first cat> $\in \mathrm{V}(D)$ at the actual world. But now, as Smith actively lacks desire for the first cat as it actually is, we clearly also require <Smith, first cat> $\notin \mathrm{V}(D)$ at the actual world, which is a contradiction. What seems to be going wrong is that the V function needs to allow for the relationships between individuals to span worlds. It is possible to restructure the logic to account for these relationships. Doing so requires making several structural changes that lead naturally to a trans-necessitist metaphysics. I outline a possible structure and interpretation for such a system in the next section.

A paired structure for QML

Let us begin with V. If V assigns *individual-world pairs* to predicates, rather than simply a set of individuals at each world to predicates, then it would be possible for Smith to desire the counterfactual first cat but not the actual first cat. For instance if the actual world were w_1 and the world in which the cat had blue-eyes were w_2 we could have $<<\text{Smith}, w_1>, <\text{first cat}, w_2>> \in \text{V}(D)$ and $<<\text{Smith}, w_1>, <\text{first cat}, w_1>> \notin \text{V}(D)$. Adjusting V in such a way means that it no longer needs to be assigned to a particular world as part of the function, since the world(s) to which the claim refers is included in the set, i.e. $\text{V}(D)(w_1) \equiv \text{V}(D)(w_2)$ for all $w_1, w_2 \in$ W and so we require simply V(D).[115] Where before there might be some single-placed predicate F where we had $\text{V}(F)(w_1) = \{a, b, c\}$ and $\text{V}(F)(w_2) = \{c, d, e\}$, we now have simply $\text{V}(F) = \{<a, w_1>, <b, w_1>, <c, w_1>, <c, w_2>, <d, w_2>, <e, w_2>\}$. This thought alone inspires a trans-necessitist concept of individuals. If V assigns *individual-world pairs* to predicates, then individuals seem to be on the same level of fundamentality as the worlds themselves. There must be both individuals and worlds before there are predicates. As is often the case with a structural adjustment in logic like this, changing V is only the start of the required adjustments. Now we need a way to associate the variables x and y in Dxy with *individual-world pairs*, not simply *individuals*. Attempts to do so by reading the quantifiers as ranging over individual-world pairs leads to logical trouble,[116] and doing so would change the semantics of quantification away from 'being an individual' as commonly understood. In addition,

[115] In a sense then, even predicates are not *located* at worlds. They *apply* to worlds as well as individuals.
[116] Demonstrating that this is the case takes us a little too far from our metaphysical topic.

it should be an aim of any modal logic to represent modality explicitly. Thus we ought first to attempt to use □ and ◇ to represent modality, rather than disguise it within a quantifier that contains modal content. A related problem is that now V(*D*) is not distinguished on the basis of the world to which it is assigned by V(*D*)(*w*), we need a new reading for the modal operators, as currently predicates are immune to modality. For instance, once we are able to assign <Smith, w_1> to *x* and <first cat, w_2> to *y*, we still want *Dxy* to be logically distinguishable from □*Dxy* and ◇*Dxy*; but with the adjusted function V being fixed at each world, there is no distinction.

These two problems are not particularly difficult to solve, and doing so reinforces trans-necessitist metaphysics. First we require the assignment ϕ to assign an individual-world pair to free variables. Thus a free variable represents an individual as it is at a particular world. When a free variable is within the scope of a predicate such as *Fx*, it is read as 'some assigned thing at some assigned world is *F*'. There is no 'world of evaluation' in the sense we are used to, only the world, or range of worlds, that each variable directs the evaluation to. Variables *always* represent individual-world pairs; one or both parts of that pair might be free and require an assignment. Now, when a quantifier operates on a variable it affects only the individual part of the individual-world pair, i.e. ∀*x Fx* means 'everything at the world assigned to *x* by ϕ is *F*'. Modality is handled in a similar way to quantification. It acts on the world part of the individual-world pair. Although the modality of single-place predicates could be left written in the usual form, problems occur when two-place predicates are required to apply to variables in different worlds such as in the case of *Dxy*. We need to be able to differentiate between ◇*Dxy* that is to read 'there is a possible world in which *x* desires *y*' and ◇*Dxy* that is to read '*x* in some possible world desires *y* in some possible world'. The most straightforward solution is to treat the modal operators — including the actuality operator— in the same way as the quantificational operators (if the model is 'pointed' the actuality operator assigns the world of the variable to the pointed world, it does not return to the world of evaluation as there is none). So with a single placed predicate, treating modality as a world quantifier, we would have $\Box x\, Fx$ rather than $\Box Fx$. This allows us to render distinct modality to each variable, e.g. $@x\ \Diamond y\ Dxy$: 'an assigned individual in the actual world desires an assigned individual in a possible world'. With both quantification and modality rendered similarly, space can be saved by assigning both operators to the same variable simultaneously, e.g. $\Diamond\exists x$ or $\Box\forall y$. The formula expressing the situation with Smith be rendered in paired QML as: $@\exists x\ \Diamond\exists y\ (Sx \wedge By \wedge Dxy \wedge @\exists z\ (FCz \wedge z = y))$ 'some actual thing is Smith and she desires some possible thing with blue eyes, and that possible thing is, in actuality, the first cat'.[117] The cases of Ponce and Smith are only two of many cases in which predication across worlds would be helpful. Other examples include times when we 'talk about', 'name', 'describe', 'pray for', 'pursue', 'dream about' or almost any other kind of directed activity that can have counterfactual individuals as its object.

Paired logic also allows us to use the necessity operator as a way of depicting the thing in itself. Imagine it were possible to love the thing in itself, as a romantic might claim: 'I would love you even if you were ninety, bald, a corpse, fifty feet tall, never born… etc.'. If *x* loves *y*, not for *y*'s qualities but for simply being *y*, we might express that as $\Box y\ Lxy$, '*x* loves *y* in itself'. This is of interest as it shows that in paired logic the necessity operator can be used to help distinguish two conceptions of individuals

[117] Adjustments to the special identity predicate are discussed in the next section.

we have —as sum totals of realised predicates, and as the thing in itself— just as it distinguishes two conceptions of implication —material and strict. I believe that the paired approach has great merit for a number of applications. For our present debate however, its impact on the Barcan equivalence needs to be examined.

The Barcan equivalence requires re-interpretation inside 'paired' QML. The obvious translation would be: $\Diamond\exists x\ \alpha \equiv \exists\Diamond x\ \alpha$ and $\Box\forall x\ \alpha \equiv \forall\Box x\ \alpha$. In paired QML these equivalences hold. The atomic case $\Diamond\exists x\ Fx$ reads 'in some possible world something is F', which is equivalent to $\exists\Diamond x\ Fx$ 'something in some possible world is *F*'. This sounds like the Barcan equivalence in terms of its metaphysical implications that we have been debating. However, it is not quite. $\Diamond\exists x\ \alpha \equiv \exists\Diamond x\ \alpha$ is metaphysically trivial in paired QML since both cases permit the variable *x* to range over the entire set of individual-world pairs and isolate *one* to be *x*. The way to distinguish the previous metaphysical conception of the difference between 'something possibly is *F*' and 'possibly something is *F*' that causes the Barcan controversy is to make sure that the 'something' that 'possibly is *F*' is an *actual* something, while the 'possibly something' that 'is *F*' is a *possible* something located at the world in which it is *F*. In paired QML such a distinction cannot be made, since things have no location so no thing is actual, and V(*F*) is a set of fixed individual-world pairs with no particular world of evaluation. Worlds and things are equally primitive. If that were the end of the discussion, paired QML would be unable to account for a very real distinction we intuit regarding the difference. But it does offer the distinction between the two via the existence predicate that *can* account for a different set of things that 'exist' at each world under V(*E*). 'Something possibly is *F*', when the term 'something' is understood in a restricted contingent sense, is interpreted as implicitly claiming that 'some actually existent thing is possibly *F*' and rendered $\Diamond\exists x\ (@\exists y\ (Ey \wedge y = x) \wedge Fx)$, while 'possibly something is *F*' is interpreted as implicitly claiming that 'some possibly existent thing is *F*' rendered $\Diamond\exists x\ (Ex \wedge Fx)$. When described in terms that include the existence predicate, it is clear that these are not equivalent, unless the existence predicate is defined as a necessary predicate, applying to a thing in all worlds. Note however that although $\Diamond\exists x\ \alpha \equiv \exists\Diamond x\ \alpha$ the order of the operators is not generally trivial. There is still a distinction between $\forall\Diamond x\ \alpha$ and $\Diamond\forall x\ \alpha$ and between $\Box\exists x\ \alpha$ and $\exists\Box x\ \alpha$. $\forall$ tells us to go to each and every individual, and $\Box$ tells us to go to each and every world, so the order makes a difference. $\Diamond\forall x$ instructs us to go to some world and then to each and every individual, i.e. 'in some possible world everything…', and thus provides a set of individual-world pairs each with the same world value and covering all individuals; whereas $\forall\Diamond x$ tells us to go to each and every individual and then to some world, i.e. 'everything in some possible world…', and thus provides a set of individual-world pairs with potentially different world values and covering all individuals. Similar considerations affect the order of the $\Box$ and $\exists$ operators when applied to the same variable.

Paired QML produces trans-necessitist metaphysics whereby things are primitive but detached from existence, the Barcan formula is trivial, and our contingentist intuitions regarding the contingent concept of 'thingness' can be accounted for via the existence predicate but become irrelevant to our concept of quantification. Note that paired QML must also assume S_5 modality. Models therefore become an ordered triple <W, D, V>. Contingency must only be claimed using predicates. A new predicate V(*R*) can be established to account for what is traditionally depicted as R in the model. V(*R*) can restrict the set of worlds in which the individuals are 'possible' and thus restrict (in a similar way to the way *E* restricts quantification to existent individuals) the modal quantification to a set of certain worlds.

The conclusion of the above discussion regarding metaphysical cases of predication translated into modal logic, is that fixed-necessitism, contingentism, and union-necessitism all fail for some cases of predication whether or not the being constraint is upheld. I have suggested a fix. Paired QML along with trans-necessitist metaphysics; I shall formally sketch paired QML in the next section although far more work remains to be done to establish it as a metaphysically robust logical system. Paired QML is quite a departure from typical Kripkean structures and some may be hesitant to take a step in that direction without thorough investigation. If so, then my claim in the recent discussions is that the being constraint is not simply in support of necessitism over contingentism, since there are cases of predication that serve as counterexamples to the being constraint and pose difficulties for both contingentism and free-logic necessitism alike.

Formalising paired QML

Paired QML takes the following symbols as primitive:

- For each natural number n ($n \geq 1$) a set of n-place predicates (either finite or countably infinite) written as A, B, C, … etc.
- A countably infinite set of *individual-world pair variables* written as x, y, z, … etc.
- The symbols ~, ∧, ∀, □, (, and).

The formation rules are as follows:

- Any sequence of symbols consisting of an n-place predicate followed by n (not necessarily distinct) individual-world pair variables is a well-formed formula (wff).
- If α is a wff so is $\sim\alpha$.
- If α and β are wff, so is $(\alpha \wedge \beta)$.
- If α is a wff and x is an individual-world pair variable then $\forall x\ \alpha$ and $\Box x\ \alpha$ are wff.

Standard definitions of ∨, ⊃ and ≡ from PC apply. Definitions for modal and quantificational symbols are:

- $\exists x\ \alpha =_{df} \sim\forall x \sim\alpha$
- $\Diamond x\ \alpha =_{df} \sim\Box x \sim\alpha$

Some notational conventions and equivalences are:

- $\forall\Box x\ \alpha \equiv \forall x\ \Box x\ \alpha$
- $\Box\forall x\ \alpha \equiv \Box x\ \forall x\ \alpha$
- $\forall\Diamond x\ \alpha \equiv \forall x\ \Diamond x\ \alpha \equiv \forall x\ {\sim}\Box x\ {\sim}\alpha$
- $\Diamond\forall x\ \alpha \equiv \Diamond x\ \forall x\ \alpha \equiv {\sim}\Box x\ {\sim}\forall x\ \alpha$
- $\exists\Box x\ \alpha \equiv \exists x\ \Box x\ \alpha \equiv {\sim}\forall x\ {\sim}\Box x\ \alpha$
- $\Box\exists x\ \alpha \equiv \Box x\ \exists x\ \alpha \equiv \Box x\ {\sim}\forall x\ {\sim}\alpha$
- $\exists\Diamond x\ \alpha \equiv \exists x\ \Diamond x\ \alpha \equiv {\sim}\forall x\ \Box x\ {\sim}\alpha$
- $\Diamond\exists x\ \alpha \equiv \Diamond x\ \exists x\ \alpha \equiv {\sim}\Box x\ \forall x\ {\sim}\alpha$.

Semantics:

A model for paired QML is a triple $<$W, D, V$>$ in which W is a set of worlds, D is a set of individuals, and V is a function such that where *A* is an *n*-place predicate, V(*A*) is a set of *n*-tuples of ordered pairs each of the form $<<a_1, w_1>, <a_2, w_2>, \ldots , <a_n, w_n>>$ for $a_1, a_2, \ldots , a_n \in$ D and $w_1, w_2, \ldots , w_n \in$ W. In the model an assignment ϕ is such that for each variable *x*, $\phi(x) = <a_i, w_i>$ for some $a_i \in$ D and some $w_i \in$ W. Where γ is also an assignment to the variables, ϕ and γ are *x*-individual-alternatives if and only if for every *y* except possibly *x* $\gamma(y) = \phi(y)$, and $\gamma(x)$ and $\phi(x)$ differ only, if at all, in the assignment given to the individual component of the individual-world pair. ϕ and γ are *x*-world-alternatives if and only if for every *y* except possibly *x* $\gamma(y) = \phi(y)$, and $\gamma(x)$ and $\phi(x)$ differ only, if at all, in the assignment given to the world component of the individual-world pair. Every wff has a truth-value, given to it by V, relative to an assignment ϕ. Truth-values for predicates, negation, and conjunction are as typical in modal LPC. Truth-values for paired quantification and modality are as follows:

- $V_\phi(\forall x\ \alpha) = 1$ if $V_\gamma(\alpha) = 1$ for every x-individual-alternative γ of ϕ, and 0 otherwise.
- $V_\phi(\Box x\ \alpha) = 1$ if $V_\gamma(\alpha) = 1$ for every x-world-alternative γ of ϕ, and 0 otherwise.

Axioms:

If α is a PC theorem under any *uniform* substitution of *all* propositional variables with paired QML wff then α is a theorem.

∀1: $\forall x\ \alpha \supset \alpha[\gamma/\phi]$ where $\alpha[\gamma/\phi]$ is the wff α under some x-individual-alternative assignment γ of ϕ.

□1: $\Box x\ \alpha \supset \alpha[\gamma/\phi]$ where $\alpha[\gamma/\phi]$ is the wff α under some x-world-alternative assignment γ of ϕ.

BE: $\Box\forall x\ \alpha \equiv \forall\Box x\ \alpha$

Transformation rules:

MP: If α is a theorem, and $\alpha \supset \beta$ is a theorem, then β is a theorem.

∀2: If $\alpha \supset \beta$ is a theorem then $\alpha \supset \forall x\ \beta$ is a theorem, as long as the individual component of x is not free in α.

□2: If $\alpha \supset \beta$ is a theorem then $\alpha \supset \Box x\ \beta$ is a theorem, as long as the world component of x is not free in α.

Identity for individuals and worlds:

ID1: $x = x$

IW1: $x \approx x$

ID2: $x = y \supset \Box x \; \Box y \; x = y$

IW2: $x \approx y \supset \forall x \; \forall y \; x \approx y$

Some brief notes on the axiomatisation:

- Propositions have gone. They cannot be represented by 0-place predicates either, since they can no longer be necessitated without a variable. Claims that do not seem to be 'about' anything in particular can be understood as being 'about' the world, and worlds can be included within the domain of individuals in order to facilitate this if required.
- Identity has become split between 'individual identity', that uses the = symbol, and 'world identity', that uses the ≈ symbol.
- The rule of necessitation has *explicitly* gone. However it *implicitly* remains in the structure, since there is no longer a world of evaluation. Therefore theorems are theorems in each world, i.e. necessarily theorems.
- Regarding each of the missing non-quantified modal axioms required for S_5 logic, note the striking resemblance to their quantificational variants. **K** is very similar to modus ponens, especially if ☐ is understood as theoremhood. **T** is striking similar to **☐1**, and **E** bears strong similarities to **☐2**. Full investigation into the nature of these relationships, as well as a thorough exploration of paired QML and its consequences is beyond the scope of this piece. Although I suggest that effort applied in this direction would be hugely rewarded.

Conclusion

If contingentism seeks to be what Williamson labels ‘whole-hearted contingentism’, it is in serious trouble. Maintaining the being constraint, **PBC**, but insisting that some things could be nothing is difficult. There are insurmountable issues that arise when accepting **NBC** and bivalence alongside **PBC**, as would be the natural course of action on both metaphysical and substitutional grounds. Stalnaker’s attempt to wriggle out this and endorse **PBC** without **NBC** runs into trouble when considering the existence predicate and identity. There also seem to be far too many instances when we *do* predicate of things that are intuitively nothing. To insist that we cannot predicate *at all* on anything that is *contingently nothing* is highly restrictive and does not represent modal speak as it occurs in our language, nor does it suit our metaphysical intuitions. If contingentism is to be a reasonable position, I suggest it is understood in a Kripkean sense, and comes at the cost of rejecting the being constraint in all its forms. Admittedly this is not a cost free option, since it means we can predicate of but not quantify over ‘nothing’.

Fixed necessitism has no satisfactory account of grounding, and thus makes it very difficult to judge what is metaphysically at stake in the positing of actually existent merely possible things. The being constraint is also insufficient to support fixed-necessitism since counterexamples can be produced that demonstrate that the objects of predication are not necessarily actually existent objects. Its one remaining virtue is its simplicity. But even here, although it may be logically simpler, it is not simpler once the metaphysics is considered alongside the logical structure. To have any credibility as a metaphysical model, it is necessary to understand the posited exotic things as some kind of actually existent things with substantial properties purely in a modal sense. This results in a much more complex ontology than is required under contingentism. Shifting the complexity from a contingentist logical model that renders contingent being explicitly in terms of existence predicates and domain functions, to one that treats everything as necessarily existent but then reminds us that existence is more complex than we thought, is not clearly a simpler approach to the theory of metaphysics as a whole. In short I argue that fixed-necessitism has little going for it, and its incredible metaphysical claims would require far more evidence than explored here in order to be taken seriously.

Union-necessitism has many benefits. Its metaphysics is not particularly different to intuitive contingent metaphysics, and it has the added power of being able to simply express our broad concepts regarding thingness in a way that contingentism does not. It is also the most natural necessitist model in terms of accounting for the grounding of things in the concrete. However, it still lacks a way to solve logical problems that emerge when considering the being constraint, and without being required for this role I think it lacks sufficient gains in expressive power to justify the added complexity required. Σx is easy enough to represent in contingentist models by $\Diamond\exists x@$ if and when required, especially once the being constraint is rejected by contingentists, allowing them to predicate on to the non-existent. Certainly we have a concept of thingness that might be more simply represented by Σx rather than $\Diamond\exists x@$, but similar issues arise regarding implication. Implication can be conceived in terms of both strict implication and material implication, but with the added power of modality, strict implication can be rendered modally as $\Box(\alpha \supset \beta)$ without the need for separate syntax. Some may wish to define and use a symbol for strict implication, just as union-necessitists are free to define and use their own union-necessitist symbol, but typically the complexity costs are thought to outweigh the expressive benefits, and thus the syntax canonically remains uncluttered by novel symbols.[118] I suggest the same approach be taken with the two types of quantification. Regardless, there seems almost nothing at stake in positing new shorthand symbols, and contingentists would likely agree that we do posses a certain conception of thingness that allows us to include non-existent non-actual things as 'things' in a broad sense. However, the logic as it stands does not fully allow us to evaluate predicates regarding these 'broad things' in non-actual terms, since all truth values assigned by V must be assigned to the world of evaluation. Thus these 'broad things' are unable to do the work truly required of them. If the debate is between Kripkean contingentism and union-necessitism then it is purely regarding terminology. My personal opinion on the terminological dispute is that as non-actual non-existent things, they are of interest only in modal contexts, and so are probably best expressed in modal terms using modal symbols, i.e. as $\Diamond\exists x@$ rather than Σx.

Trans-necessitism asks us to examine our metaphysical assumptions about the derived nature of thingness and its grounding. If we can accept such metaphysics it provides a powerful and simple logical structure. Not only does it allow us to maintain the highly intuitive 'being constraint', it also supports many of our other metaphysical intuitions by making the concepts of 'something', 'existence' and 'actuality' precise, assigning them distinct roles in our metaphysical toolset: intuitions regarding the contingent nature of thingness become accounted for by the existence predicate, while the

[118] A union-necessitist might respond that by adding the Σx quantifier, he or she no longer needs the @ operator. If so, I still suggest the @ operator is preferable to an extra quantifier and corresponding additional domain within the model. But the choice is largely one of terminological preference.

actuality operator combines with pointed models to locate ‘actuality’ within a set of worlds. Separating the concept of ‘something’ from the concepts of ‘existing’ and ‘being actual’ in the way the trans-necessitist model of paired QML does also allows us to express the difference between the thing in itself, and the thing as a sum total of predicates, and for that distinction to be expressed modally. I have also demonstrated that it is only paired QML that is capable of representing the vast array of real life situations in which predicated relations apply to individuals from different worlds. For those willing to accept its novel metaphysics and logical structure, trans-necessitism provides a flexible and powerful logic, and in my opinion ought to be preferred to its closest rival: Kripkean contingentist logic.

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