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Necessitism and Unrestricted Quantification

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Necessitism and Unrestricted Quantification

Violeta Conde

RESUMEN

Tal y como lo expresa Timothy Williamson, el "necesitismo" es la doctrina metafísica que afirma que necesariamente todo es necesariamente algo. Dado que la anterior afirmación involucra la cuantificación modal irrestricta, el necesitista debe aceptarla como formando parte de un discurso inteligible. En este artículo presentaré una de las objeciones principales que ha sido dirigida para poner en un brete la inteligibilidad de la cuantificación irrestricta: la objeción basada en el llamado Principio Todo-en-Uno. A continuación, propondré diferentes estrategias que el necesitista puede adoptar para protegerse de la objeción que tal principio plantea a su tesis.

PALABRAS CLAVE: *necesitismo; cuantificación irrestricta; principio todo-en-uno; modalidad; teoría de conjuntos.*

ABSTRACT

As Williamson puts it, 'necessitism' is the metaphysical view that claims that "necessarily everything is necessarily something". As that claim involves modal unrestricted quantification, the necessitist must accept it as a part of an intelligible discourse. Here, I present one of the main objections that have been presented against the intelligibility of unrestricted quantification: the objection based on the so-called All-in-One Principle. I then propose possible strategies that the necessitist could adopt to shield themselves from the objection.

KEYWORDS: *Necessitism; Unrestricted Quantification; All-in-One Principle; Modality; Set-Theory.*

I. INTRODUCTION

As Timothy Williamson puts it, 'necessitism' is defined as the metaphysical view that claims that "necessarily everything is necessarily something" [Williamson (2013), p.14]. In other words, necessitism defends the truth of the following modal principle:

$$(N)\ \Box\forall x\ \Box\exists y\ (x = y)$$

Quantifiers in (*N*) are understood as quantifying over absolutely everything whatsoever that populates the modal universe. So, we could assume that whoever argues for necessitism must accept (modal) unrestricted quantification as part of coherent and intelligible discourse. However, several objections have been raised against the intelligibility of unrestricted quantification. Here, I will focus on the one based on the so-called All-in-One Principle [Cartwright (1994); Rayo & Uzquiano (2006)] since it has specifically been developed in connection with necessitism. Thus, in the first part of the paper, I will attempt to outline the problem that the All-in-One Principle poses for necessitism and its use of unrestricted quantification. After that, I will propose different strategies necessitists can follow to shield themselves from the challenge posed by the objection.

When we refer to 'everything' in natural languages, we usually do so in a context in which the domain of objects is explicitly or tacitly restricted. For instance, if I go on a trip with a friend and I say to her: 'Please put everything in the backpack.' I am not calling on her to put every single atom[1] in her backpack, but only those things that will be useful for our trip. In fact, unrestricted quantification is not a common phenomenon outside theoretical contexts such as logic and ontology [Uzquiano (2020)]; nevertheless, it has been called into question in different ways. Some authors have argued that any talk that aims to be absolutely general would only actually be so within a specific framework. For instance, Hellman notes that the objects recognized as values of the first-order variables in a certain language vary depending on the conceptual apparatus that underpins that language; an apparatus that involves "a parsing of experience" [Hellman (2006), pp. 83-84]. Consequently, any intended absolutely general talk would be 'absolute' only relative to that schema and, therefore, would be just a linguistic fiction.

A similar view can be traced to Rayo's anti-metaphysicalism.[2] From the point of view of a metaphysicalist, not just any language is suitable to represent facts about the world insofar as there are better languages for that purpose, namely those whose logical structure matches the metaphysical structure of the world and which therefore 'carve Reality at its joints' [Rayo (2013)]. According to Rayo (2013), metaphysicalism can be understood as a conjunction of a metaphysical thesis and a linguistic one. Regarding the metaphysical part of this proposal, the metaphysicalist contends that there is only one true way to cut Reality up into its fundamental parts; with respect to the linguistic aspect of the thesis, the metaphysicalist claims that a sentence is true if and only if there is a correspondence between its logical form and the metaphysical structure of the world. Contrary to this, an anti-metaphysicalist would hold that the only requirement for a language to be adequate to depict Reality is that its logical form signifies truth conditions for sentences based on the semantic values of the lexicon of the language. In this sense, there would not be a *bona fide* language that represents Reality as it is, so there is no definitive answer as to how to carve up Reality into objects. Consequently, any talk that pretends to be about absolutely everything would depend directly on which objects make up the extension of the concept 'everything,' with different notions of 'everything' depending on which objects are chosen to be part of that extension. Rayo mentions, nevertheless, a "moderate form of metaphysicalism according to which the constraint that there be a correspondence between logical form and metaphysical structure applies only to assertions made by philosophers in the 'ontology room'" [Rayo (2013), p. 11]. Later, I will defend the claim that necessitism can be viewed as a form of moderate metaphysicalism.

II. Sets and Modal Paradoxes

Any objection that casts doubt on the intelligibility of unrestricted quantification in general, can be applied in the context of Williamsonian necessitism, which makes use of unrestricted quantification to formulate (*N*), the thesis at the core of its metaphysical view. Here, however, I will focus — as I have said — on one specific argument that has been proposed in close connection with necessitism and which involves the so-called All-in-One Principle [Cartwright (1994); Rayo & Uzquiano (2006)]. According to that principle, the objects we find in any domain of discourse should form a set or at least a set-like object. If we accept this, we agree that the kind of objects we can find in the domain of a modal discourse such as necessitism — e.g., 'actual objects,' 'possible objects,' 'merely possible objects,'[3] etc. — can form a set. However, in such a modal context, the All-in-One Principle has been shown to be prone to paradox when brought together with a plausible principle of recombination [Nolan (1996); Sider (2009); Hawthorne & Uzquiano (2011); Uzquiano (2015a); (2015b)].

Consider the following principle of recombination for possible worlds, due to Nolan (1996):

> (*R*) “For any objects in any worlds, there exists a world that contains any number of *distinct* duplicates of all of those objects” [Nolan (1996), p. 242].

Suppose one accepts (*R*) as a plausible principle (in what follows, I will take it for granted) and the All-in-One Principle. In that case, it is possible to argue thus: by the All-in-One Principle, the set of absolutely all objects exists — because there is a set made up of the objects that populate discourse about *everything* — and its cardinality is given by $\varkappa$. By Cantor’s famous theorem,[4] one can conclude that $\varkappa < 2^{\varkappa}$, so there could be a set whose cardinality is given by $2^{\varkappa}$ and which is therefore bigger than the set of absolutely all objects. Now, by (*R*), for any object in any world, there is a possible world that contains $2^{\varkappa}$ copies[5] of it, so the set of absolutely all objects should contain at least $2^{\varkappa}$ objects. But this result contradicts our initial claim that the set of absolutely all objects has cardinality $\varkappa$, showing the paradoxical result that the set of absolutely all objects is larger than itself (see *Figure 1* for an example).

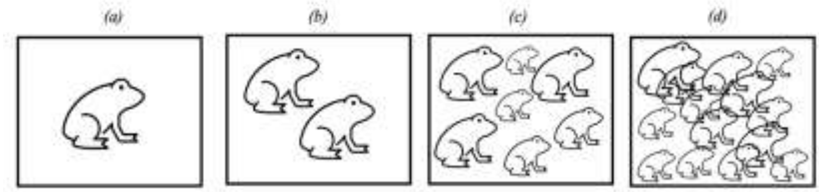

Figure 1. Let us consider the following examples. (i) First, there only exists one frog; so, according to the All-in-One Principle, there exists the set of absolutely all the objects (*a*), but since there only exists one frog, the cardinality of such a set will be given by 1. However, by Cantor’s theorem, we can conclude that $1 < 2^1$, so there could be a set whose cardinality is given by 2^1. Now, by our Principle of Recombination (*R*), there exists such a set (*b*), for there could be at least 2^1 copies of our unique frog in another world. Therefore, our original set (*a*) wasn’t the set of absolutely all objects. (ii) The same argument can be extrapolated to sets of other cardinalities. Let us imagine again that there exist only frogs and that the set made up of all frogs (namely, *everything*) (*c*) has cardinality κ. Again, according to Cantor’s theorem, we can conclude that there could exist a set whose cardinality is given by 2^{κ} and we know – by (*R*) – that there is a world – and, therefore, by the All-in-One Principle, a set (*d*) – which contains at least 2^{κ} copies of each frog in (*c*). Consequently, set (*c*) was not the set made up of absolutely all objects.

The paradox emerges because (*R*) forces us to answer the question: ‘How many objects are there in the set of absolutely all objects?’ by saying that ‘there are at least as many objects as there are ordinal numbers’.[6] Formulated this way, the argument applies Lewisian modal realism since it is well known that for Lewis, possible worlds are conceived as real scenarios which exist spatiotemporally and that are isolated from the actual world, so modality is reduced to extensional facts about the whole multiverse. However, it is necessary to go one step further for this argument to apply to Williamson's conception of modality. Although both Lewis and Williamson indeed embrace the assumption that 'everything which could exist does actually exist', Williamson is not committed to the concrete existence of objects which made up the extension of possible worlds, but instead defends the thesis that possible worlds are populated by non-concrete entities that exist only in a logical sense, since they have failed to exist substantively, i.e., concretely:

> But 'exist' has more than one sense. For in one sense events do not exist; they occur. Three-dimensional physical objects exist when they are somewhere. Call that the substantival sense of 'exist' ('S-exist'), since we might conjecture that only substances exist in that sense (in some sense of 'substance'). In another sense events do exist, simply because there are events; to exist is to be something. Call that the logical sense of exist ('L-exist`), since it is definable given identity and the unrestricted quantifier. Trivially, everything L-exists; not everything S-exists, because events do not [Williamson (2000), p.130].

In this sense, a reformulation in modal terms is required to accommodate this kind of argument to Williamson's metaphysical frame. This task has been undertaken by Sider [2009] who has proposed two versions of the argument. The first uses an infinitary modal language to reformulate (*R*) as the following schema, where '$\Sigma X\varphi$' means the existential quantification of 'φ' concerning the variables in 'X'; '$\Lambda\Gamma$' means the conjunction of all formulas in 'Γ'*;* 'Sx' means 'x is a set'; and the variable 'X' could be replaced by any set of variables [Sider (2009), pp. 2-3]:

(R∞) $\Diamond\sum X\wedge\{\ulcorner\neg Sx \wedge x \neq y\urcorner$: where x and y are different in X$\}$[7]

As Williamson commits himself with the Barcan Formula $\Diamond\exists x\, Ax \rightarrow \exists x\, \Diamond Ax$, there is no reason to think that he would reject the infinitary version of it, $\Diamond\sum X\varphi \rightarrow \sum X\, \Diamond\varphi$ (*BF*∞). In addition, Sider considers the following two auxiliary assumptions for the sake of the argument:[8]

(1) *Essentiality of non-sethood:* $\Box\forall x\, (\neg Sx \rightarrow \Box\neg Sx)$

(2) *Necessity of distinctness:* $\Box\forall x\forall y\, (x \neq y \rightarrow \Box\, x \neq y)$

Now, the argument is articulated as follows [Sider (2009)]:[9]

(i) by the All-in-One Principle, the set of absolutely all modal objects exists and its cardinality is given by κ.

(ii) Let us now suppose that we have an instance of (*R*∞) where the cardinality of X is greater than κ, say, for instance, 2^{κ}.

(iii) By (1) and (2), (*R*∞) implies

$$\sum X \wedge \{\ulcorner \Box\neg Sx \wedge \Box\, x \neq y \urcorner\text{: where } x \text{ and } y \text{ are different in X}\};$$

(iv) Then, via an instance of (*BF*∞), it is possible to obtain:

$$\sum X\, \Diamond \wedge \{\ulcorner \Box\neg Sx \wedge \Box\, x \neq y \urcorner\text{: where } x \text{ and } y \text{ are different in X}\}.$$

(v) Now, by an infinitary analog of the formula

$$\exists X \Diamond (\varphi \wedge \psi) \vdash \exists x (\Diamond\varphi \wedge \Diamond\psi),$$

(regular reasoning in modal propositional logic), it is possible to conclude:

$$\sum X \wedge \{\ulcorner \Diamond\Box\neg Sx \wedge \Diamond\Box\, x \neq y \urcorner\text{: where } x \text{ and } y \text{ are different in X}\}.$$

(vi) Finally, when considering an infinitary analog to

$$\exists x (\Diamond\Box\varphi \wedge \Diamond\Box\psi) \vdash \exists x\, \varphi \wedge \psi$$

(which is valid in S_5 calculus), it is possible to conclude:

$$\sum X \wedge \{\ulcorner \neg Sx \wedge x \neq y \urcorner\text{: where x and y are different in X}\};$$

that is to say that the set of absolutely all (modal) objects has cardinality 2^{κ}. But since by (i) we have affirmed that the set whose members are absolutely all (modal) objects has cardinality κ, we have got a contradiction.

In this way, Sider has reconstructed in modal terms the original argument put forward by Nolan, where modality ‘fades’ because of the *sui generis* Lewisian conception of possible worlds. One can now wonder why Sider chooses to present the argument using an infinitary modal language. I believe that this could be viewed as an endeavor to keep ‘linguistic ersatzism’ at bay. Linguistic ersatzism is a view that offers an alternative to the strong metaphysical commitments of Lewis’ modal actualism regarding the status of possible worlds. According to that alternative, possible worlds can be understood just as maximal and consistent sets of sentences (so no ‘strange’ spatiotemporally located alternative realities are needed). However, according to Sider (2002), linguistic ersatzism faces a big problem: the so-called 'problem of descriptive power'. Loosely, this problem consists of the impossibility for ersatzism to represent all conceivable possibilities; for instance, one can imagine two different worlds, w_1 and w_2 (two different maximal and consistent sets of sentences in the terms of the ersatzist), which are qualitative identical except for two non-actual individuals that have swapped their qualitative role. Linguistic ersatzism will presumably identify these two worlds with a single sentence and since from such a viewpoint two different possible worlds are qualitatively identical if and only if they are defined by the same maximal and consistent set of sentences, there would be no way to distinguish these two worlds (even if the individuals who play a particular role in each world are different).

Of course, as Sider notes (2002, p. 5) "the objection assumes there can be qualitatively identical worlds differing in which qualitative roles are played by which individuals. This assumption is a controversial doctrine sometimes called haecceitism". Because he does not want his objection to rely on haecceitism, Sider displays an analogue objection that dispenses with individuals and involves just properties; an ersatzist can then use descriptions of the roles that non-actual properties play, but again these descriptions could not differentiate worlds in which the properties swap roles. Sider acknowledges that this result could be avoided if one embraced specific theses about properties (e.g., that they play their roles essentially, etc.) but, in any case, linguistic ersatzism would make talk of possible worlds depend on highly controversial metaphysical doctrines.

As an alternative, Sider proposes abandoning linguistic ersatzism and embracing the idea of a single 'ersatz pluriverse', that is: "a single abstract entity that represents the totality of possible worlds and individuals all at one" [Sider (2002), p. 9]. Then, the surrogate of possible worlds would not be maximal and consistent sets of sentences anymore, but a single pluriverse sentence which comprehensively describes the modal universe by allowing every individual and every property in it to be characterized unequivocally. The main point of Sider's movement is that the talk of possible worlds becomes talk about a single surrogate — the pluriverse sentence — so quantification over non-actual objects or properties is no longer interpreted as quantification over different worlds (or maximal and consistent sets of sentences), but rather as the truth of a quantified sentence according to the pluriverse sentence. We can now see how the problem of descriptive power is solved: since one talks about possible worlds as a whole, the entire description of the modal universe is given by the pluriverse sentence, including situations in which non-actual objects or properties have swapped their qualitative role in qualitatively identical worlds.

Evidently, it is necessary to use an infinitary language to give an account of the single entity that acts as a description of the modal universe, for infinitely many existential quantifiers and infinitely many world conjunctions must be allowed. If one adopts this approach to the modal universe, the election of an infinitary language to introduce problems like the one posed by the conjunction of the All-in-One Principle and the principle (*R*) is understandable. Nonetheless, Sider is aware that infinitary languages are regarded with suspicion, so he provides an alternative version that dispenses with them [see Sider (2009)].

To avoid the problem posed by principles of recombination such as (*R*) or (*R*∞), the necessitist could just try to restrict them. However, this alternative suffers from serious arbitrariness since there is apparently no reason to establish an upper bound to the cardinality of the set of absolutely all (modal) objects. Another possible answer may be to say that no ordinal manages to set an appropriate upper bound on the cardinality of the set of absolutely all (modal) objects; Hawthorne and Uzquiano express this idea as the following principle:

> *Indefinite Extensibility*. 'There could not be so many angels as to exceed each and every aleph, but for each *a*, there could be exactly ℵ*a*-many angels in existence' [Hawthorne & Uzquiano (2011), p.58].[10]

As Hawthorne and Uzquiano (2011) point out, since Williamson's necessitism endorses the Barcan formula, in this context a claim such as indefinite extensibility entails that "if there could be exactly ℵ*a*-many objects in existence, there are exactly ℵ*a*-many possible objects in existence". But again, the necessitist would face the same problems as before, as the principle of recombination shows that it is possible to assign a cardinality greater than ℵ*a* to the set of absolutely all possible objects.

After considering this series of arguments, it seems that the necessitist's only two alternatives are either to give up the idea of the intelligibility of unrestricted quantification or to accept that the most powerful tool we have to deal with extensionality, namely set theory, is not good enough to handle metaphysical issues like treating Reality in the widest sense. Maybe the latter option is not so bizarre, but for the moment there are some things to consider.

III. Last Call to Sethood

The iterative conception of a set behind Zermelo-Fraenkel set theory (ZF) has been common among mathematicians and logicians since Russell's paradox disrupted the naive conception. Some advantages of the iterative conception are that it seems very natural, it is well motivated and it has so far proved to be consistent; so we have no good reasons to be afraid of discovering paradoxes [Boolos (1971), p. 218]. Now, if we wish a theory like ZF to be faithful to the spirit of our metaphysical inquiry, we should add urelements to it; although, of course, set theories generally can dispense with the urelement axiom (in fact, many set theorists prefer pure set theory). Nevertheless, there are different motivations for the addition of urelements. First, the iterative conception itself calls for it: according to that conception, sets are formed in a series of cumulative stages, and it is plausible to think that all individuals are available to us to be gathered to form a set at the very beginning of the hierarchy.[11] Another reason to keep the urelement axiom is that we need urelements if we want to apply mathematics to other fields of inquiry, as indeed we do. In McGee's words: "But we need *Urelemente* if we want to talk about applications. If we want to count popsicle sticks, we need to form sets of popsicle sticks, and if we want to measure pieces of lumber, we need to form functions — sets of ordered pairs — mapping physical objects to real numbers" [McGee (1997), p. 49]. Finally, an ulterior motive is provided by McGee's (1997) proof of categoricity for second-order logic plus a urelement axiom.[12] McGee has proved that in any two models of second-order ZFCU (ZF + axiom of choice + urelements) plus the urelement axiom in which we use quantifiers unrestrictedly, we have isomorphic pure sets: the urelements are so many that no matter what they may be, the structures among pure sets are so rich that we can find an isomorphic copy of the structure of the urelements in them. In McGee's words: "Even though we do not yet have a hypothesis as to what the urelements are, we can be confident that the machinery of transfinite arithmetic is powerful enough to be capable of assigning them a cardinal number" [McGee (1997), p. 53]. In essence, McGee's dictum proves his optimism regarding the possibility of assigning cardinality to the set of all urelements: his belief in the richness of the set-theoretical universe motivates his optimism. Moreover, McGee's view is in line with the All-in-One Principle since the urelement axiom guarantees the existence of the set of absolutely all objects. However, again one can call on the paradoxes related to recombination.

In addition to this, Menzel (2014) has proposed modifying ZFCU to make the iterative conception of a set compatible with the existence of the set of absolutely all urelements. According to him, since the iterative conception guarantees us to have the set of all urelements at the very beginning of the set-theoretical hierarchy, the problem at hand cannot be equated to the problem Russell-like sets raise for sets, even if both results have to do with absolute generality. The problem with a set made up of absolutely all sets is that it is 'too high up' in the hierarchy, whereas the issue with the set of absolutely all urelements is that it is "too wide" [Menzel (2014), p. 10]. Consequently, Menzel proposes restricting the replacement schema[13] so that it only applies to 'small sets', since this restriction precludes the possibility of deriving a contradiction from the conjunction of the All-in-One Principle with (*R*) or (*R*∞).

A modification like that proposed by Menzel is an attempt to resolve the paradox while keeping the iterative conception of *set* at all costs. Nobody will deny the virtues of that conception, but we might wonder whether another conception of 'set' would be more convenient if we wish to deal with the high levels of generality that are often present in metaphysical inquiry. Let us consider, for instance, Quine's New Foundations set theory (NF) [Quine (1937)]. In NFU (NF + urelements) it is possible to have the universal set and a set of urelements whose cardinality exceeds every other cardinality.[14] Some authors [see Incurvati (2020); Gracia-Di Rienzo (2021)] have defended the idea that the logical conception of a set provides an independent motivation for NF; so maybe we should adopt that conception when we wish to embark on absolute general discourse. According to such a conception — the logical one — sets are collections connected with properties, so membership of a set is directly driven by the property associated with the set. So, NFU can be viewed as a theory of objectified properties or classes, and this kind of theory blocks set-theoretical paradoxes by rejecting indefinite extensibility [Incurvati (2020), p. 179]. In this sense, one can think about the property 'being a urelement' as characterizing, in the logical sense, the set of absolutely all urelements.[15]

IV. A Necessitist Guide for the Perplexed

So far, we have considered the main problems that the All-in-One Principle poses for necessitism. Meanwhile, many authors have defended the intelligibility of unrestricted quantification by appealing to different reasons. My aim now is to present some of these positive arguments and suggest other paths that necessitists can follow to protect their metaphysical frame from the objections raised by the All-in-One Principle.

Some general arguments can be deployed to support the intelligibility of unrestricted quantification. One can invoke, for instance, a sort of pragmatic license. Kant said: "Human reason has the peculiar fate in one species of its cognition that it is burdened with questions which it cannot dismiss, since they are given to it as problems by the nature of reason itself, but which it also cannot answer, since they transcend every capacity of human reason" [Kant (1998), p. 99]. In most cases, in natural languages, we use contextually restricted quantification. Nevertheless, it cannot be denied that unrestricted quantification has attracted the attention of metaphysicians. Even if the issue of unrestricted quantification is no more than a fancy game played by the armchair philosopher, it deserves consideration insofar as it appears to be a notion that everyone engages with, in the Kantian sense expressed above. To this effect, a principle of charity on the side of the skeptics is called for since, as Williamson (2003), p. 417, notes, ordinary conditions are sufficient for you to know that when I talk about 'everything'— for example, in this paper — I am talking about absolutely everything and not about everything except this or that. I am convinced that you, my reader, are following my use of the expression 'absolutely everything' throughout this text and that you understand it not in any restricted sense. Additionally, as I have made clear, some authors [McGee (1997); Williamson (2003)] have held that discourse about the unintelligibility of unrestricted quantification cannot be coherent. Claiming that 'it is impossible to quantify over everything' is self-defeating: those who support only the restricted use of 'everything' should recognize that the use of 'everything' in any claim is thus restricted and therefore that a claim such as this must be false (because, in fact, it can only quantify over 'everything' in the restricted sense). As Quine once said, "we might just stop tugging at our bootstraps altogether".[16]

Another different strategy used to defend unrestricted quantification is to say, following McGee (2000), pp. 58-59, that the universal interpretation of quantifiers is the one we learn when learning a language since restricted quantification is not learnable in isolation from the unrestricted version. Let us consider a hypothetical child learning a language: it is not possible to know, *prima facie*, whether the variables used by the child range over a restricted domain or an unrestricted one. So, why claim that the child is using unrestricted quantification? McGee proposes that we think of a language as defined by the rules and practices followed by its users, instead of thinking of it as a system of sentences that demands an interpretation. If one thinks of a language in this former way, one should accept that the rules are learnable but, according to McGee, restricted quantification is not learnable, for to learn it the child must be able to distinguish between the things that constitute the domain of quantification and those that do not. Achieving such a distinction would imply either restricting the rule of universal specification in such a way that we could only infer $\alpha(\tau)$ from $\forall x\, \alpha(x)$ when τ is included in the restricted domain, or including a restriction that bans terms which designate individuals outside the restricted domain. And, as McGee rightly suggests, the child would have to be able to distinguish between the elements which are within and outside the restricted domain before even learning and employing the rules of the language. Ultimately, the lesson we should extract from McGee's reasoning is the following: if we abandon semantic interpretations of language in favor of syntactic interpretations of language, then we may think that the use we make of rules of inference — in this case, the rule for the universal quantifier — are characteristic of the unrestricted use of quantifiers. That would be so because it would be impossible *a priori* to apply those rules in a restricted manner without first knowing to which objects their application was restricted. Similarly, Williamson (2003) has defended the idea that it is possible to understand restricted quantification only by virtue of unrestricted quantification, which would be more straightforward than the former claim: to understand quantification within a contextual restriction would imply understanding unrestricted quantification, since the former would be the result of restricting the latter explicitly.

On another note, Restall, in an unpublished manuscript entitled *Existence, Definedness and the Semantics of Possibility and Necessity* [Restall (2016)], accepts that it is possible to derive the Barcan formula by combining the rules for the modal operators and the classical rules for first-order quantifiers in the context of his hypersequent calculus.[17] Because he wants to protect contingentism — the thesis that denies necessitism — he proposes defining new rules for the quantifiers for free logic, at the risk of losing, among other things, the technical simplicity and the natural interpretation of the rules for first-order quantifiers.[18.] It is true, however, that the interpretation Restall gives to the hypersequents poses some problems for necessitism when deriving the Barcan formula, although Restall himself admits that it is possible to redefine the rules for the quantifiers to maintain the derivation of the Barcan formula and preserve a natural interpretation of quantifiers while avoiding the problems mentioned.

These arguments are examples of ways of supporting unrestricted quantification, but they are not the only ones [for another interesting argument, see Williamson (2000)]. However, I feel this brief presentation is sufficient as I would now like to propose other lines of argumentation necessitists can follow to shield themselves specifically from the objection presented in the first part of the paper.

IV.1. *The status of Necessitism as a Conceptual Schema*

The necessitist can accept the existence of certain conceptual schemas which are more fundamental than others to characterize the realm of Reality (in this case, the realm of the modal universe). According to Williamson, our best scientific theory provides the best description of Modal Reality. Given the characterization of metaphysicalism in the introduction, it is fair to think that Williamson could be considered a moderate metaphysicalist. He would not deny the existence of alternative theories about the modal universe but defends that there is such a theory, S_5 axiomatized with the Barcan formulae, which describes Reality better than others; at least when we are in the ontology room. Assuming this, however, commits us to accepting necessitism as a metaphysical frame for modality. Of course, the *onus probandis* of asserting that necessitism is a conceptual schema which is more fundamental than others lies on the necessitist, who should be able to provide criteria the conceptual schema must meet to be considered more fundamental, namely, criteria for considering S_5 axiomatized with the Barcan formulae our best theory about modality. In pursuing this task, the logical sense of existence held by the necessitist — a seemingly natural way to understand existence — helps a lot, since understanding existence in this way implies understanding it as a precondition for absolutely everything to be something. Presuming that Reality comprises everything — and assuming we consider ourselves, when in the ontology room, as moderate metaphysicalists — we need a frame that allows us to speak about everything; and necessitism is a suitable and appealing thesis for this purpose.

IV.2. *The All-in-One Principle again*

Again, we have to ask: what shall we do with the objections based on the All-in-One Principle? First, it is unclear that such a principle should be maintained as true for every discourse. There may be intelligible spheres of discourse for which the All-in-One Principle does not count as true. The necessitist can then adopt a sort of 'plural quantification' talk instead of set-talk. As Cartwright (1994, pp. 2-8) notes, quantification does not need additional elements like sets to be successful, for it is possible to quantify directly over things. Plurality-talk can avoid the ontological commitment to sets and provide direct discourse about Reality. However, we must assess carefully under what circumstances plurality could not account for a set; for instance, the fact that one can refer to 'everything' as a plurality formed by all the things in the realm of Reality does not block the possibility of referring to it as a set as well. It is not the aim of this paper to analyze those cases in which set-talk is senseless; I only wish to urge caution and alert the reader that the problem is there.[19] Also, as Williamson (2013) notes, pluralities-talk is insufficient when adopting higher-order necessitism, so we should be careful in which necessitist contexts it makes senses and in which it does not.

However, another option is available for the pluralities-talk skeptics and the supporters of the All-in-One Principle. The necessitist can still support the All-in-One Principle but defend another set conception, instead of the classical iterative one. As we have seen before, Quine's NF system provides a set theory that not only avoids the paradoxes linked to the universal set but also those related to unrestricted quantification in the context of necessitism, provided we accept a principle of recombination of the sort introduced — (*R*) or (*R*∞). More recently, Roberts (2019) has proposed a way to juggle first-order necessitism with the All-in-One Principle in general, and with the iterative conception of set in particular. According to Roberts, in the context of what he calls 'modal expansionism'[19], one can accept a claim such as "for each cardinal number $\varkappa$, according to some at least as inclusive interpretation it is metaphysically possible that there exist $\varkappa$ non-sets" [Roberts (2019), p. 1169]. Such a claim is compatible with the All-in-One Principle and makes necessitism impervious to the recombinatorial objections.

Be that as it may, necessitism is mainly a metaphysical thesis; but, what does that mean? I am keen to follow Williamson in his metaphysical anti-exceptionalism: a position with Quinean overtones that supports the idea that metaphysics can make use of formal tools, as other sciences do. However, this assumption does not imply that such resources should establish the bounds of metaphysics. To problematize the issue of whether it is possible to talk about everything when 'everything' includes modal objects — that is to say, to talk about everything in a modal context, such as necessitism — using technical apparatus as weapons, would be out of context when considering metaphysical issues since assuming that it is not possible or senseless would mean denying the very possibility of giving a general discourse; and that is what metaphysics definitely attempts to do. Using set-theoretical arguments to disrupt necessitism only shows the failure of these arguments to treat problems with metaphysical magnitude like the necessitist general discourse about the modal universe. Moreover, if one refuses to accept that the set-theoretical cumulative hierarchy reflects Reality, then the only option available is to say that the concept of 'everything' could not be treated extensionally, thereby accepting that set theories such as ZFCU are the most powerful tools we have to deal with extensionality. Maybe the concept 'everything' should be treated logically using alternative set theories or maybe we should just dispense with set theories in general when reaching such a level of the metaphysical discourse. Because I do not wish to disregard those who are perplexed concerning that way of understanding metaphysics, I have suggested alternative frameworks to deal with necessitism without dispensing with 'more technical' tools, such as using an alternative set theory like Quine's NF or adopting plurality-talk (with the caution mentioned).

I prefer the idea that talking about 'everything' makes sense and that you as a reader have been following me in what I have attempted to say so far, since we have both settled down inside the ontology room. The ontology room is not, however, stagnant: it is a place full of problems and ideas open to anyone who wants to enter it and bring her toolbox with her.

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NOTES

[1] *Nota bene*: since my aim in this paper is to discuss metaphysical questions, my use of the term ‘atom’ should be understood in a ‘Democritean’ sense, that is, as things that lack proper parts and are the ultimate constituents of Reality. To this effect, the physical notion of ‘atom’ must be left behind.

[2] According to Rayo (2013), *metaphysicalism* is the metaphysical viewpoint that defends that an atomic sentence is true if and only if there is a correspondence between the logical form of that sentence and the metaphysical structure of Reality. In opposition, *anti-metaphysicalism* is the view that denies *metaphysicalism*.

[3] For the difference between ‘possible object’ and ‘merely possible object’ see Williamson (2003).

[4] $|X| < |\wp(X)|$, for every set X.

[5] We can conceive these duplicates as *mere possibilia* in the context of necessitism.

[6] Such as answer is baptized by Hawthorne and Uzquiano as ‘modal plenitude’ [see Hawthorne & Uzquiano (2011)]

[7] ‘There may exist a set whose members are all non-sets, *sive* individuals, and they are different from each other’. Such as schema guarantees that there exists an instance for each infinite cardinality ν and, therefore, in terms of Hawthorne and Uzquiano (2011), modal plenitude.

[8] These assumptions could be easily derived from other two principles that, in principle, should be accepted by a necessitist: the ‘essentiality of sethood’ and the ‘necessity of identity’ [see Sider (2009)].

[9] Sider assumes the infinitary analogs of inferences endorsed by S_5 quantified modal calculus and the infinitary version of the Converse Barcan Formula to deploy his argument.

[10] Hawthorne and Uzquiano refer to ‘angels’ in the context of their paper, but we should envisage here ‘objects’ instead.

[11] According to the supporters of pure set theory, at the very first stage of the set-theoretical hierarchy we would have just the empty set. However, this could be viewed also as a set theory with just one urelement, *sive* the empty set.

[12] *Urelement Axiom*: $\exists x\, (Sx \wedge \forall y\, (\neg Sy \rightarrow y \in x))$ where ‘Sx’ means ‘x is a set’.

[13] Many logicians have questioned the status of the Replacement Schema on the iterative conception of set [see Incurvati (2020) for further discussion].

[14] I thank Thomas Forster for pointing this out to a colleague and me.

[15] I am currently working together with a colleague on a paper in which we develop this idea technically and philosophically intending to offer it in the foreseeable future.

[16] See Quine (1951).

[17] The rules for the classical first-order quantifiers in Restall’s hypersequents calculus are defined as follows [Restall (2016), p.14]:

$$\frac{\Gamma \rightarrow A(n), \Delta \mid H}{\Gamma \rightarrow \forall x\, A(x), \Delta \mid H} \qquad \frac{\Gamma, A(n) \rightarrow \Delta \mid H}{\Gamma, \exists x\, A(x) \rightarrow \Delta \mid H}$$

In these rules 'n' cannot occur in the premise hypersequent (except for its use in A(n)). For the derivation of the Barcan Formula see also Restall (2016).

[18] Se Williamson (2013) for further discussion.

[19] For further discussion, see Barrio (2014).

[20] 'Modal expansionism' is the view that claims that modal space can always be expanded. As Roberts puts it: 'Moreover given the indefinite extensibility of 'metaphysical necessity', there will never be an ultimate interpretation of metaphysical modal operators. For any modal space over which such operators range could always be expanded via the introduction of a new possibility' [Roberts, (2019), p. 1154].

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