Logic is Metaphysics

Daniel Durante Pereira Alves

Federal University of Rio Grande do Norte - (Brazil) LanCog Group - Lisbon University - (Portugal)

durante@ufrnet.br

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Analyzing the position of two philosophers whose views are recognizably divergent, *W. O. Quine* and *M. Dummett*, we intend to support a striking point of agreement between them: the idea that our logical principles constitute our principles about what there is, and therefore, that logic is metaphysics.

Logic is Metaphysics Summary







Dummett's Position

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Introduction

The idea that logic and metaphysics are bound in some way and that our logical principles represent principles about reality, despite sounding strange to many contemporary ears, is as old as logic itself.

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Aristotle – *Metaphysics*

The grounds of this ontological aspect of logic were explicitly laid down by Aristotle in the Metaphysics, where some of the basic laws of logic were held to be among the most certain principles of all things. (Chateubriand, Logical Forms)

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Frege – Grundlagen der Arithmetik

The foundation to the idea that laws of logic are prescriptions to the correct thought is the fact that logic laws are laws asserting what is: Any law asserting what is, can be conceived as prescribing that one ought to think in conformity with it, and is thus in that sense a [prescribing] law of thought. My aim is to show that the claim that logic is metaphysics can be inferred from the works of Quine as much as from the works of Dummett, despite their sharp disagreement in many other fundamental philosophical issues related to logic and metaphysics.

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...to obtain acquiescence of the authors.

I also do not claim that the two authors explicitly present or support the identification between logic and metaphysics, but only that we can infer this account from the works of both.

Quine - On What There Is

Suppose now that two philosophers, McX and I, differ over ontology. Suppose McX maintains there is something which I maintain there is not. McX can, quite consistently with his own point of view, describe our difference of opinion by saying that I refuse to recognize certain entities. [...] When I try to formulate our difference of opinion, on the other hand, I seem to be in a predicament. I cannot admit that there are some things which McX countenances and I do not, for in admitting that there are such things I should be contradicting my own rejection of them. [...] This is the old Platonic riddle of nonbeing. Nonbeing must in some sense be, otherwise what is it that there is not?

• Is it possible to argue about ontology?

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- Is it possible to claim the non existence of something without become committed with the very existence the thing we claim does not exist?
- How to identify in our discourses, in our theories, when we are committed to the existence of something?

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- The linguistic usage of the name Santa Claus relies on some concept or understanding of what Santa Claus would be, but this concept or understanding is not, by no means, Santa Claus itself.
- The concept of God, the meaning of the word 'God', exists for both theistic and atheistic people. However, only a theistic person believes in the existence of God itself.

Traces of Ontological Commitment

Quine's question in On What There Is

• What are the truthful existence imputation traces in our theories?

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- They should not be grammatical names, otherwise, "*Pegasus has never existed*", would be a contradiction.
- What evidences allow one to sustain that a theory subsumes a given object or objects of some kind, like numbers, sets, unicorns, properties, deities, dots, Santa Claus, etc.?

We will find the answer in logic.

The answer Quine presents is that a theory is committed to the existence of certain objects when it would be false if the class of these objects were empty. Despite being obvious, this response leads to a more fundamental question: how can this fact be verified? In other words, how can we know that a theory would be false if some class of objects is empty? Logic is the answer. Our theories will be ontologically committed to the objects inhabiting the semantic models of their logical formalizations. Here is the first moment when logic meets metaphysics, but still in a very weak way.

Ontological Commitment Criterion Based on Logic

"To be is to be the value of a variable"

Quine - On What There Is

To be assumed as an entity is, purely and simply, to be reckoned as the value of a variable.[...] [W]e are convicted of a particular ontological presupposition if, and only if, the alleged presupposition has to be reckoned among the entities over which our variables range in order to render one of our affirmations true.

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To determine the ontological commitments a theory or discourse has, Quine appeals to its logical structure. Logical formalization becomes a tool for identifying existence presuppositions in our theories.

Logic as an Ontological Tool

Building an answer step by step

If we formalize the sentence:





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If we formalize the sentence:

Santa Claus exists $\exists x (x = santaclaus)$

then we are in trouble, because:

Santa Claus doesn't exist

 $\neg \exists x (x = santaclaus)$

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But this is a **contradiction** because if santaclaus is a name, an individual constant, then any model dealing with the language of these formulas should have to have an object in its domain which is *santaclaus*' reference.

Names presuposes existence in classical logic

The platonic riddle of non-being has strength. Its first order formalization is valid in classical logic. For any individual constant \mathbf{c} , the following trivial proof guarantees that whatever is named by \mathbf{c} exists.

Proof of Plato's beard			
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- Any claim of non-existence of a named entity (to which there is an individual constant) is false.
- This practically precludes any ontological debate.

Descriptivist approach on names

To avoid this, Quine suggests there should be no names in our formal systems. Names should be formalized by descriptions, where a description is a formula with one free variable $\mathbf{Q}(\mathbf{x})$ that states some properties specific enough for the individuation of the named object. And if we don't have a good description for the object, then we can use the name itself to create a new individuating predicate symbol: **IsSantaClaus**. Now, to affirm or deny Santa Claus' existence no longer involves any contradiction:

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Names are regimented as individuating descriptive predicates

∃x IsSantaClaus(x)	-	Santa Claus exists.
¬∃x IsSantaClaus(x)	-	Santa Claus doesn't exist.

Due to this radical elimination of names in favor of descriptions, all claims of existence or nonexistence are regimented in the language of first order logic as sentences of the forms

 $\exists \mathsf{x}\, \varphi(\mathsf{x})$

$\neg \exists x \varphi(x)$

where φ is a unary predicate symbol or a formula (with one single free variable and no individual constant) which describes the suposed entity in question.

We can affirm or deny the existence of a supposed entity without fear of unwilling ontological commitments imposed by names. Quine appeals to formal logic to identify the truthful existential commitments in our theories. But this was just a first step to propose a deeper relationship between logic and metaphysics. He carries on his analysis asking:

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What is existence?

Existence is what existential quantification expresses:

- There are things of kind **F** if and only if $\exists x F(x)$.
- This [allegation] is as unhelpful as it is undebatable.

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Quine argues it is meaningless to require an explanation of existence in simpler terms. We can, at most, search for answers to the following questions:

- What counts as evidence for existential claims?
- When are assertions about the existence of something true?
- Which are the truth conditions for existential assertions?

- The best explanation of existence we can give is achieved by understanding what are the truth conditions for existential claims.
- According the way we have regimented existential claims, the question about its truth conditions can be rephrased to:
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When is $\exists x \varphi(x)$ true?

There is no simple answer here. It depends on what we mean by $\varphi(x)$.

When $\varphi(x)$ is "x is a rabbit" ou "x is a unicorn"

- The empirical world answers.
- Evidence for truth or falsity of $\exists x \varphi(x)$ is the testimony of senses.
- Empirical evidence is enough to solve the question.

When $\varphi(x)$ is "x is a prime number between 10 and 20"

- There is no empirical evidence in this case.
- Evidence for truth or falsity of $\exists x \varphi(x)$ is now a computation, a calculus.
- Mathematical evidence is enough to solve the question.

When $\varphi(x)$ is "x is a number" ou "x is a property"

- There is neither empirical nor mathematical/computational evidence.
- Evidence for truth of falsity of ∃x φ(x) is now much more difficult to specify.
- The question has became a metaphysical question about ontology.

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How can we decide it?

What are our sources of evidence to answer a philosophical question?

Establishing Evidence \rightarrow Defining Ontology \rightarrow Doing Metaphysics

Quine states some reasons to include numbers and to exclude propositions and attributes from the domain of our variables (from our ontology):

Quine – Existence and Quantification

Number and classes are favored by the power and facility which they contribute to theoretical physics and other systematic discourses about nature. Propositions and attributes are disfavored by some irregular behavior in connection with identity and substitution.

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Quine establishes a double source of evidence for ontological claims. The kind of reason he proposes to deny allegations of existence is sharply different from the kind of reason he proposes to accept such allegations.

The reasons to **deny** ontolgical claims are **logical**:

some irregular behavior in connection with identity and substitution

The reasons to **accept** ontolgical claims are **pragmatic**:

the power and facility which they contribute to [...] systematic discourses about nature

Besides being useful, numbers behave well according our logical principles of identity and substitution. Properties, otherwise, as they lack solid identity conditions, are not admissible as ontological entities. The property 'to be a rational animal' seems to be different from the property 'to have an opposing thumb'. But as they have the same extension, it is not clear how to theoretically account their distinction. The property 'not to be a horse', which is not itself a horse, seems to be in its own extension. But if it is possible that properties are in their own extensions, then we can easily construct Russell's paradox with them. Many logical difficulties arise if we assume properties or attributes in our ontology and let them be in the domain of our variables.

Standard of Ontological Admissibility Based on Logic

"No entity without identity"

Quine – Speaking of Objects

Certainly the positing of first objects makes no sense except as keyed to identity.

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- The pragmatic reasons Quine offers for accepting numbers in his ontology can only be applied because numbers do not disrespect this logical standard of ontological admissibility.
- It is only because numbers behave well according to our logical principles of identification and differentiation that we can pragmatically appraise allegations of its existence.
- Also empirical and mathematical sources of evidence for existential claims respect this more basic logical standard.
- So, logic comes first!

Logical Laws as Standard of Ontological Admissibility

What does not respect logical laws of identity and replacement, does not exist

When sentences committed with supposed objects of some kind do not behave well according to our logical principles of identification and differentiation, the classical logic laws of identity, then this is the best vestige we can have of the nonexistence of these objects. Everything who exists must follow the logical laws of identity.

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In case of doubt about the existential status of some supposed objects, when the more objective sources of evidence are absentees, we should appeal to our logical principles to help us solve the issue. And even though the logical principles are not enough to tell us that some supposed entity exists, they do are enough to tell us that some supposed entity can not exist.

This logical principles, then, are the most general and fundamental principles that have to be respected by whichever candidate for a existing thing we might think of. Then, these principles constitute our most basic principles of being. They are metaphysical principles.

For Quine, our logical principles of identity are the most basic source of the evidence for general existential assertions. So our logical principles of identity, together with the rest of our logic, constitute our most basic principles of being, that is, our metaphysics. In other words, our logical rules of identity represent our standards for ontological admissibility, and then they constitute a fundamental aspect of our metaphysics by showing what should be the ways of being of those entities we are willing to accept as existent.

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This means that our logical system for quantification (including identity), express exactly our concept of existence.

Quine – Existence and Quantification

But still one may ask, and Hao Wang has asked, whether we do not represent being in an unduly parochial way when we equate it strictly with our own particular quantification theory to the exclusion of somewhat deviant quantification theories. [...] [B]ut what of intuitionistic quantification theory, or other deviations? [T]he intuitionist has a different doctrine of being from mine, as he has a different quantification theory; and [...] I am simply at odds with the intuitionist on the one as on the other.

Quantification Theory = Concept of Existence

Logic is Metaphysics

Quine – Existence e Quantification

Classical quantification theory enjoys an extraordinary combination of depth and simplicity, beauty and utility. It is bright within and bold in its boundaries. Deviations from it are likely, in contrast, to look rather arbitrary. But insofar as they exist it seems clearest and simplest to say that deviant concepts of existence exist along with them.

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- But different logics, different quantificational theories, would represent different metaphysical systems expressing different concepts of existence.
- Logic is Metaphysics.

Dummett's Position

The Logical Basis of Metaphysics

Dummett starts his book, whose title is quite suggestive for our theme, *The Logical Basis of Metaphysics*, settling a metaphysical question:

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The debate between realists and phenomenalists concerning the physical world is the most appealing example.

The Logical Basis of Metaphysics

Fisical World – realism x phenomenalism

Our knowledge of the physical world comes through senses; but are these channels of information about reality that exists quite independently of us, as the realist supposes, or are our sense experiences constitutive of that reality, as the phenomenalist believes?

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Mathematics – platonism x constructivism, formalism

Here the realists are usually known as 'platonists': they believe that a mathematical proposition describes, truly or falsely, a reality that exists as independently of us as the realist supposes the physical world to do. Opposition to platonism takes various forms. On the one hand, formalists say that there are no genuine mathematical propositions at all [...]. Constructivists, on the other hand, [...] hold that they [mathematical propositions] relate to our own mental operations.

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The Logical Basis of Metaphysics

Mind –	realism x behaviorism
Realism	Our behavior is evidence for inner mental states, like beliefs, desires and feelings.
Behaviorism	To ascribe to someone a belief or a desire, or even to attribute to him a pain or other sensation, is simply to say something about the pattern of his behavior.



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Ethics – realism x subjectivism

Realism An ethical statement is as objectively true or false as an affirmation about the high of a mountain.

Subjectivism An ethical statement has the same status as an affirmation about whether something is interesting or boring.

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Science, Time, Universals, Possible Worlds,...

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Debates on realism

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Debates on realism

- Dummett searches for a strategy to study comparatively and solve these controversies.
- To do this is obviously to do metaphysics, once any decision in any of these debates will make a difference in our conception of reality.
- But which are the means available to help us to decide these disputes on realism?
- No physical observation would tell us if the physical world exists independently of our observation, and no mathematical investigation can determine whether or not mathematical truth is beyond the reach of proofs or refutations.

Semantic Reinterpretations of The Debates on Realism Mistaken traditional formulations

Dummett's first step in search for a common strategy to solve these debates was to redefine its terms so that a unique formulation would be suitable for all its instances. He starts criticizing the established ways in which disputes over realism have been expressed.

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Ontological Formulation

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Linguistic Formulation

Asks whether certain expressions, as general terms or names of material objects, genuinely have a reference.

None of These Formulations is General Enough

Unifying the controversies

Dummett - Realism

It is, however, clear that neither of these two formulations is entirely happy: phenomenalism seems to be better described as the view that material objects are reducible to (constructions out of) sense-data, than as the view that there are no such things as material objects or that names of material objects do not really stand for anything. Moreover, in [...] at least one other [case], that of platonism in mathematics, the concentration on the reference of terms seems to me to deflect the dispute from what it is really concerned with; as Kreisel has remarked, the issue concerning platonism relates, not to the existence of mathematical objects, but to the objectivity of mathematical statements.

Semantic Reinterpretations of The Debates on Realism Unified Formulation

Dummett – Realism

Realism I characterize as the belief that statements of the disputed class possess an objective truth-value, independently of our means of knowing it: they are true or false in virtue of a reality existing independently of us. The anti-realist opposes to this the view that statements of the disputed class are to be understood only by reference to the sort of thing which we count as evidence for a statement of that class.[...] The dispute thus concerns the notion of truth appropriate for statements of the disputed class; and this means that it is a dispute concerning the kind of meaning which these statements have.

Earth is the center of the universe

Is truth transcendent to verifiability?

Traditional Formulations

For scientific realists, there is an outer reality, independent of us, deciding whether or not the statement is the case, and for the anti-realists, there is not. The reality is not as independent as realists suppose.

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Semantic Formulation

Realism The statement is to be true or false regardless of whether we will ever have any kind of evidence for or against it. Truth is transcendent to verifiability.

Anti-realism The statement can only be true if there is evidence in favor of it and can only be false if there is evidence contrary to it. Truth depends on verifiability.

Truth, Bivalence, and Excluded Middle

Alethic divergences entail apodictic distinctions

Realism – Truth is transcendent to verifiability $\models (\varphi \lor \neg \varphi)$

If truth has no epistemological constraint, then every proposition **p** is always true or false. So, realists endorse the principle of bivalence. But if all **p** are always true or false, then $(p \lor \neg p)$ is true for all propositions **p**. Then realists also endorse the principle of excluded middle: $(\varphi \lor \neg \varphi)$

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Anti-realism – Truth depends on verifiability $\nvDash (\varphi \lor \neg \varphi)$

If truth depends on verifiability, then it might be a proposition **q** to which there is no evidence neither in favor nor against it. Then, under an anti-realistic notion of truth, **q** is neither true nor false and therefore $(q \lor \neg q)$ is not true. This means that, according to the anti-realistic view, excluded middle $(\varphi \lor \neg \varphi)$ is not a logical truth.

Does Logic Depend on Metaphysics?

Metaphysical divergence \rightarrow semantical distinction \rightarrow logical disagreement ?

If realists and anti-realists disagree about the validity of a logical principle, then their logics are different. Rejecting the law of excluded middle, anti-realists also reject all arguments it helps to demonstrate and then, the two groups have different standards of inference. A difference in metaphysics demands a difference in logic.

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Who comes first, logic or metaphysics?

It may seem, at first sight, that our metaphysical choices produce logical consequences. If it is the case, it would be better to say that logic depends on metaphysics, instead that logic is metaphysics. Even this weaker conclusion would be interesting by contradicting the well-known supposed metaphysical neutrality of logic. But before we infer it, lets go back and look at Dummett's critics on classical metaphysical ways of dealing with the controversies on realism.

Dummett's Criticism on Traditional Metaphysics

How to solve the controversies on realism?

Dummett – The Logical Basis of Metaphysics

An attack from the top down tries to resolve the metaphysical problem first, then to derive from the solution to it the correct model of meaning, and the appropriate notion of truth, for the sentences in dispute, an hence to deduce the logic we ought to accept as governing them. This approach, as we have seen, has twin disadvantages. First, we do not know how to resolve these disputes. The moves and counter-moves are already familiar, having been made repeatedly by philosophers on their side throughout the centuries.

Dummett Is a Conceptual Analist

The bounds of philosophy

Dummett - The Logical Basis of Metaphysics

Philosophy can take us no further than enabling us to command a clear view of the concepts by means of which we think about the world, and, by so doing, to attain a firmer grasp of the way we represent the world in our thought. It is for this reason and in this sense that philosophy is about the world.

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Dummett's Metametaphysics

Metaphysics as meaning theory, meaning theory as logic

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1 – Meanings are determined by use (wittgensteinian approach)

Meanings of statements are completely determined by use. No hidden power confers these meanings on them: statements mean what they mean in virtue of the way we use them, and of nothing else.

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2 – Meaning is undetachable from truth

The concepts of meaning and truth are so intimately connected that no fruitful philosophical explanation of either can be given that relies on the other's being already understood.

The first fulcrum enables us to do meaning theory without any metaphysical presupposition. Wherever there is a successful use of language it will be possible to come with a meaning theory that will depict the metaphysical image involved in that specific branch of language. What we call metaphysics, then, doesn't come as presuppositions about the way reality is, but it will be only a picture that has to be suitable for the truth notion (and meaning notion) adequate to explain the specific language usage in question. So metaphysics doesn't come first, but it will be the resulting image brought by meaning theory.

The second fulcrum, together with the methods Dummett uses to establish the bases of any meaning theory, makes it so close to logic, that the title he has chosen to his book was *Logical Basis of Metaphysics*. In this book, Dummett doesn't propose any specific meaning theory, but he tries to establish the grounds on which any meaning theory has to be based, and these grounds are logical ones. There are many ways through which one can do logic, and Dummett's methods on meaning theory can be identified with one of these ways, which is related to the logical tradition of proof theory. Then, in a broad sense, to do a meaning theory is to do logic. The basis of all meaning theory are logical. To solve any controversy on realism, we need, first of all, to establish a notion of truth related to the way we talk and think in that specific language field. This truth notion will be just the alethic side of the same coin whose apotictic side is a logical system defined by inference rules which describe our way of speak, think and reason on this specific matter. Only then a metaphysical image can emerge from this meaning theory.

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So, if we join these two fulcrums, the wittgensteinian approach to meaning as based on use and the logical binding between meaning and truth, then we can conclude that instead of been a consequence of metaphysical choices, as it looked like at first sight, **logic is metaphysics**.