

# LOGIC IS METAPHYSICS

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**Abstract.** 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.

**Keywords:** Logic; metaphysics; ontological commitment; ontological admissibility; realism; anti-realism.

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## 1. Introduction

The idea that logic and metaphysics are bonded 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. In the introduction of the first volume of his *Logical Forms*, Chateaubriand points out:

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”. (Chateaubriand 2001, p. 17)

Chateaubriand himself, in this same work, presents a magnificent account of logic as metaphysics, which is deeply different from both views we will sketch in the sequel. Also in the works of Newton da Costa we can find vestiges showing his awareness of the close relationship between logic and metaphysics:

Logical laws are rules of the rational context, but also reproduce, between limits, very general relations in force in reality. The constitutive reason, so to speak, builds reality supported by real foundations, providing the elements for the operative reason to work. Rational categories, although prepared by constitutive reason, reflect, in some way, directly or indirectly, mediate or not, real-world characters. (da Costa 1994, p. 215, translation mine)

Our aim in this paper is to show the stance that logic is metaphysics can be independently inferred from the works of Quine and Dummett, despite their sharp disagreement in many other fundamental philosophical issues related to logic. We are not doing it through an exhaustive examination of all their works, but only

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pointing out, in both cases, some key passages and conceptions keen enough to allow us to conclude our thesis. We also do not claim that the two authors explicitly present or support this identification, but only that we can infer the account of logic as metaphysics from the works of both. We know there are excerpts from some Quine's other works in which it seems he has a different view.<sup>1</sup> However, the arguments presented here, we believe, are strong enough to justify us to assign to both authors the thesis that logic is metaphysics. Therefore, any contrary statement made by them would be a signal of inconsistency in their works taken as a whole, or an explicit change of mind.

## 2. Quine's Position

In order to perceive the binding between logic and metaphysics in Quine's work, we will present briefly the well-known way he uses formal logic as a tool to recognize ontological commitments necessarily incurred by a given discourse or theory. Then we will describe the also famous standard of ontological admissibility defended by him. Here again, logic is the key element Quine uses to sustain this standard. Through reflecting on how can this be justified, we will get to our subject.

### 2.1. Traces of Ontological Commitment

In the first page of his essay *On What There Is*, Quine states:

Suppose now that two philosophers, McX and I, differ over ontology. Suppose McX maintains there is something which I maintain there is not. [...] When I try to formulate our difference of opinion, [...] 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? (Quine 1963b, p. 1–2)

The questions Quine is trying to address here are: is it possible to argue about ontology? Is it possible to claim the non existence of something without become committed with the very existence the thing we claim does not exist? We can only answer affirmatively these questions if we overpass this riddle of non-being, what is to say, if we do not impute ontological commitment to the names we use in our discourses.

When I say that Santa Claus doesn't exist, I don't want to commit myself with the existence of Santa Claus. I don't want to admit new senses, maybe mental or cultural senses of existence. I don't want to mix up Santa Claus with the concept or idea of

Santa Claus. The language 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.

Then what, but names, are the truthful existence imputation traces in our theories? When should one to support that a theory subsumes a given object or objects of some kind, like numbers, sets, unicorns, properties, God, dots, Santa Claus, etc.?

The answer Quine presents us is that a theory is committed with 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 ontological presuppositions will be the objects inhabiting the semantic models of the logical formalizations of our theories. Here is the first moment when logic meets metaphysics, but still in a very weak way.

## 2.2. Ontological Commitment Criterion Based on Logic

Quine states:

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. (Quine 1963b, p. 13)

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. Let’s briefly see how it works. If we formalize the sentence ‘Santa Claus exists’ like

$$\exists x(x = \text{santaclaus})$$

then we are in trouble because the formalization of ‘Santa Claus doesn’t exist’ should be like

$$\neg\exists x(x = \text{santaclaus})$$

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. This shows the strength of the

platonic riddle of non-being, who has a valid formalization in classical logic. For any individual constant  $c$ , the following trivial proof guarantees that  $c$  exists.

1			
2		$c = c$	$=Intro$
3		$\exists x(x = c)$	$\exists Intro: 2$

As a consequence, any claim of individual non-existence with the form  $\neg\exists x(x = c)$  is a contradiction. 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  $Q(x)$  settling the properties of the named object.<sup>2</sup> And if we don't have a good description for the object, then we can use the name itself to create a new predicate symbol:  $IsSantaClaus$ . Now, to affirm or deny Santa Claus' existence no longer involves any contradiction:

$$\begin{aligned} &\exists x IsSantaClaus(x) \\ &\neg\exists x IsSantaClaus(x) \end{aligned}$$

Quine was strongly criticized about the supposed artificiality of this kind of predicates based on names. But their supposed artificiality is not bigger than the artificiality of a name we use and to whom we do not have a good description.

In general, assertions of existence have the form  $\exists xP(x)$  and assertions of nonexistence the form  $\neg\exists xP(x)$ , where  $P$  is a predicate symbol or a formula (with one single free variable) which describes the entity in question.

Now we can argue about ontology. Quine appeals to formal logic to identify 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: what is the existence?

### 2.3. Standard of Ontological Admissibility Based on Logic

In *Existence and Quantification* we start to find Quine's answer:

Existence is what existential quantification expresses. There are things of kind  $F$  if and only if  $\exists xF(x)$ . This is as unhelpful as it is undebatable. (Quine 1969c, p. 97)

Quine argues it is senseless to require an explanation of existence in simpler terms. It seems he is avoiding metaphysics, but it will be exactly this refuse that will bring logic closer to metaphysics. Instead of trying to explain the existence, Quine

tries to answer the following questions: what counts as evidence for existential quantification? When assertions about the existence of something are true? Which are the truth conditions for existential assertions?

Following last section's conclusions, we can rephrase these questions as: when  $\exists x P(x)$  is true? But there is no simple answer here. It depends on what  $P(x)$  stands for. When  $P(x)$  is 'x is a rabbit' or 'x is an unicorn' then the empirical world answers the question. The evidence here for  $\exists x P(x)$  is the testimony of senses. When, otherwise,  $P(x)$  is 'x is a prime number between 10 and 20', then mathematics answers the question. There is no empirical evidence for  $\exists x P(x)$  in this case, but the evidence is now a computation, a calculus. However, if  $P(x)$  stands for 'x is a number' or 'x is a property', the question whether  $\exists x P(x)$  is true or false becomes a metaphysical question. There is no empirical nor computational evidence for  $\exists x P(x)$ . The evidence is now much more difficult to specify, and it will demand us to assume some metaphysical presuppositions. (Quine 1969c, p. 97)

Does the number seven exist? Does the red color exist? What evidence do we have to answer these questions? What are the truth conditions for  $\exists x P(x)$  when  $P(x)$  stands for a number or a property? To respond to these questions is to set an ontology, and setting an ontology is to do metaphysics. This is exactly what Quine does when he states some reasons to include numbers and to exclude properties from the domain of our variables. Quine alleges that numbers are welcome due to the power and facility they give to science and other systematic discourses, and also due to their good behavior in connection with the fundamental logical relation of identity and with the also fundamental logical operation of substitution. On the other hand, the erratic behavior properties have in connection with identity and substitution justify their exclusion from our ontology. The property 'to be a rational animal' is or is not identical to the property 'to have an opposing thumb'? The property 'not to be a horse' which is not itself a horse, is or is not in his own extension? Many logical difficulties arise if we assume properties in our ontology and let them be in the domain of our variables.

Quine then states his famous standard of ontological admissibility: "no entity without identity". In *Speaking of Objects* he says:

Certainly the positing of first objects makes no sense except as keyed to identity. (Quine 1969b, p. 23)

When supposed objects of some kind do not behave well according to our logical principles of identification and differentiation, the 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. 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 solve the issue. Then,

these principles constitute our most basic principles of being. They are metaphysical principles.

#### 2.4. Logic is Metaphysics in Quine's Framework

For Quine, our logical principles of identity are the very source of the evidence standard for general existential assertions. So our logical principles of identity, together with the rest of our logic, constitute our most basic principles about the 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. This means that our logical system for quantification, including identity, express exactly our concept of existence. Quine says:

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? Now one answer is that it would indeed be a reasonable use of words to say that the intuitionist has a different doctrine of being from mine, as he has a different quantification theory; and that I am simply at odds with the intuitionist on the one as on the other. (Quine 1969c, p. 108)

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. (Quine 1969c, p. 112–13)

Quine is quite clear here. To establish a logical system with quantification and identity is to establish a concept of existence. Then, different theories of the same logic would represent different ontologies admissible in the same metaphysical system, under the same concept of existence. But different logics, different quantificational theories, would represent different metaphysical systems expressing different concepts of existence. Logic is metaphysics.

### 3. Dummett's Position

It is difficult to find two analytical philosophers diverging more than Quine and Dummett, but we intend to show also in Dummett's work a binding between logic and metaphysics. We will first present Dummett's semantic reformulation of the traditional metaphysical debates on realism and show, through this, that metaphysical

differences among the contestants demand different logics. Then, finally we show that instead of been affected by metaphysical choices, it is logic who commands the relation and affects our metaphysical images.

### 3.1. Debates on Realism

Dummett starts his book whose title is quite suggestive for our theme, *The Logical Basis of Metaphysics*, settling a metaphysical question: should we take a realistic attitude regarding this or that class of entities? The debate between realists and phenomenalists concerning the physical world is the most appealing example.

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? (Dummett 1991, p. 4–5)

Another prototypical example is the debate concerning the reality of mathematical entities.

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; their truth therefore cannot outstrip our ability to prove them. (Dummett 1991, p. 5)

Similar controversies arise concerning many other subject matters, like mind, ethics, science and time, among others. Concerning mind, for example, a realistic view states that our behavior is evidence for inner mental states, like beliefs, desires and feelings. Opposing it, a behaviorist would say that “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” (Dummett 1991, p. 5). An ethical statement, for a moral realist, is as objectively true or false as an affirmation about the high of a mountain, but for a moral subjectivist, an ethical statement has the same status as an affirmation about whether something is interesting or boring. In each of these disputes, realism is a definite doctrine and its denial takes many different forms, all of them being a variety of anti-realism, a term that, according to Dummett, “denotes not a specific philosophical doctrine, but the rejection of a doctrine”. (Dummett 1991, p. 4)

Dummett searches for a strategy to study comparatively and solve these controversies. To do this is obviously to do metaphysics, once any decisions in any of these

debates will make a difference in our conception of reality. But what is the means we have to come to a decision on 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 (Dummett 1991, p. 8).

### 3.2. Semantic Reinterpretations of The Debates on Realism

The Dummett's first step in the search for a common strategy to solve these debates is to redefine its terms so that a unique formulation would be suitable to all its instances. In a much earlier article from 1963 named *Realism*, Dummett starts criticizing the established ways in which disputes over realism have been expressed.

The formulation I call ontological states that a dispute over realism may be expressed by asking whether or not there really are entities of a particular type, like universals or material objects, or even asking whether these entities are among the ultimate constituents of reality. The linguistic formulation, otherwise, asks whether certain expressions, as general terms or names of material objects, genuinely have a reference (Dummett 1978b, p. 145).

Dummett argues that none of these formulations is general enough to unify the various instances of the debate.

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. (Dummett 1978b, p. 146)

Dummett then reformulates the problem in a very general semantic way.

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.* (Dummett 1978b, p. 146, emphasis mine)



Consider the statement ‘Earth is the center of the universe’. The traditional way to set the controversy points out that 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 the realists suppose. But Dummett stresses the semantic aspect of this divergence and makes us to notice that for a scientific realist, the statement is to be true or false regardless of whether we will ever have any kind of evidence for or against it. On the other hand, for an anti-realist, 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. Then, the main divergence between the two groups is the notion of truth they consider appropriate for the statement in question. A realist will defend that truth is transcendent to verifiability and an anti-realist that truth depends on verifiability. These are the new general terms in which Dummett presents the debates on realism.

### 3.3. Truth and The Principle of Excluded Middle

If the main divergence between realists and anti-realists is whether or not the notion of truth is transcendent to verifiability, then they are disagreeing about the validity status of a famous logical principle: the *Excluded Middle*.

The principle states  $(A \vee \neg A)$  is a logical validity. This means that  $(p \vee \neg p)$  is true for every proposition  $p$ . This principle is usually equivalent to the *Principle of Bivalence*, which states that every proposition  $p$  is either true or false. But these two laws are correct only in the realistic approach, where truth does not depend on verifiability. In this case, any proposition has to be true or false, no matter whether we can know it or not. Then,  $(p \vee \neg p)$  will always be true and the excluded middle principle will be logically valid. However, if truth depends on verifiability, then it might be a proposition  $q$  to which we do not have evidence neither in favor nor against it. Then, under the anti-realistic notion of truth,  $q$  is neither true nor false and therefore  $(q \vee \neg q)$  is not true. This means that, according to the anti-realistic view,  $(A \vee \neg A)$  is not logically valid.

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. The intuitionists, constructivist mathematicians, where the first who understood that rejection of realism entails rejection of classical logic. “If a mathematical statement is true only if we are able to prove it, then there is no ground to assume every statement to be either true or false.” (Dummett 1991, p. 9)

### 3.4. Logic is Metaphysics in Dummett's Framework

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, let's go back and look at Dummett's critics on classical metaphysical ways of dealing with the controversies on realism. In Dummett's words:

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 1991, p. 12)

Dummett is an analytical philosopher, and he reminds us of this in the very first page of his *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. (Dummett 1991, p. 1)

So, in order to do not exceed philosophy's limits, the only way we have to do metaphysics is dealing with our thoughts. Dummett then proposes a bottom up strategy and starts to set the basis of what he calls a *Meaning Theory* that is based on two fundamental fulcrums. The first one is the wittgensteinian approach on meaning: meanings of statements are completely determined by use. "No hidden power confers these meanings on them [statements]: they mean what they mean in virtue of the way we use them, and of nothing else" (Dummett 1991, p. 13). The second one is the strong connection between meaning and truth:

As Frege was the first to recognize explicitly, the concepts of meaning and truth are intimately connected; so intimately that no fruitful philosophical explanation of either can be given that relies on the other's being already understood.<sup>3</sup> (Dummett 1991, p. 12)

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 is not a cause, but a consequence.

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 all 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.

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.

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**Resumo.** Analisando alguns aspectos das posições de dois filósofos cujas abordagens são reconhecidamente divergentes, W. O. Quine e M. Dummett, pretendemos sustentar um contundente ponto de acordo entre eles: a ideia de que nossos princípios lógicos constituem nossos princípios sobre o que há, e portanto, que lógica é metafísica.

**Palavras-chave:** Lógica; metafísica; compromisso ontológico; admissibilidade ontológica; realismo; anti-realismo

## Notes

<sup>1</sup> Chateaubriand, in particular, relies on the following passage to sustain that the idea of logic as metaphysics is nonsense for Quine (Chateaubriand 2001, p. 15):

Is logic a compendium of the broadest traits of reality, or is it just an effect of linguistic convention? Must all right-minded men agree on logic, or is it every language for itself? [...] Just now the first of two questions, or forms, has proved unsound; or all sound, signifying nothing. (Quine 1986, p. 96)

<sup>2</sup> It is clear that  $Q(x)$  can't have the form  $\exists x(x = c)$ .

<sup>3</sup> See also the emphasized quotation on page 38.