

On Quine's Ontology: quantification, extensionality and naturalism (from commitment to indifference)

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Abstract

Much of the ontology made in the analytic tradition of philosophy nowadays is founded on some of Quine's proposals. His naturalism and the binding between existence and quantification are respectively two of his very influential metaphilosophical and methodological theses. Nevertheless, many of his specific claims are quite controversial and contemporaneously have few followers. Some of them are: (a) his rejection of higher-order logic; (b) his resistance in accepting the intensionality of ontological commitments; (c) his rejection of first-order modal logic; and (d) his rejection of the distinction between analytic and synthetic statements. I intend to argue that these controversial negative claims are just interconnected consequences of those much more accepted and apparently less harmful metaphilosophical and methodological theses, and that the glue linking all these consequences to its causes is the notion of extensionality.

Keywords: ontology, quantification, extensionality, naturalism, logic, metaontology.

Two of the quinean metaontology most basic theses which are so well accepted that, according to van Inwagen (2009), became the methodological foundations of a whole ontological tradition, say:

Existence is univocal. (1)

The single sense of existence is adequately captured by the existential quantifier. (2)

If existence is univocal, then there are no different modes of being. Any existing thing exists exactly in the same sense as anything else. If, in addition, this unique sense of existence is captured by the logical quantifiers, then there is only one unrestricted range of quantification covering everything that there is. If numbers, stones and attributes exist, then the same variable 'x' can take values among numbers, stones and attributes. There are no multiple types of variables, but a single one. So, theses (1) and (2) lead Quine to the following thesis:

There is a single and unrestricted domain of quantification that covers all there is. (3)

The admission of a single and unrestricted domain of quantification helps explain the simplicity of the famous slogan “*to be is to be the value of a variable*” (Quine, 1963c, 15), but it also requires Quine to be careful with what may be among these values, i.e., with what may exist. I want to relate this idea of *ontological caution* to some of the most controversial theses of Quine, such as:

- (a) His insistence on accepting only first-order quantification and his rejection of higher-order logic.
- (b) His resistance on accepting the intensionality of ontological commitments.
- (c) His rejection of first-order modal logic.
- (d) His rejection of the distinction between analytic and synthetic statements.

I intend to argue that ontological caution required by principles (1), (2) and (3) imposes to all theoretical discourses a requirement of extensionality as a protection, and that these controversial theses are just interconnected consequences of this requirement. Moreover, I will also argue that extensionality and also principle (1) of the univocity of existence are not self-justified in Quine’s approach. They are consequences of a more basic metaphilosophical principle: Quine’s naturalism. So, the metaphilosophical thesis of naturalism and the methodological thesis (2) of the binding between existence and logical quantification, which took in isolation don’t seem so harmful, are the main responsible for all controversial quinean theses listed above.

§

One of the main sources of criticism in Quine’s work is the strictness of the canonical notation in which theories must be regimented in order to have their ontological commitments evaluated. The ontological commitments of a theory are the entities it assumes as extant and, according to Quine,

entities of a given sort are assumed by a theory if and only if some of them must be counted among the values of the variables in order that the statements affirmed in the theory be true. (Quine, 1963a, 103)

But talking about the values of variables of a theory presupposes it to be regimented in a formal language, since there are no variables in natural language. And, this formal language where a theory must be regimented prior to any evaluation of its ontological commitments is, for Quine, the language of first-order classical logic. He argues that we must be able to regiment in a first-order language whatever deserves to be called a theory. But why not using second-order logic with its richer language? Why not allowing quantification over predicates and also relations and thereby to expand the possibilities of the being through an expansion of what can be a value of a variable?

This alternative, however, is not open to Quine. It is incompatible with thesis (3), the admission of a single and unrestricted domain of quantification, because if he admits second order, i.e., if he admits quantification over predicates and relations, then he immediately gets Russell’s paradox. As Potter (2004, 300) has well pointed, there are only two ways to avoid Russell’s paradox in second-order logic: either abandoning the universality of the domain of quantification, thesis (3), or abandoning extensionality,

i.e., considering that there can be predicates ‘G’ and ‘F’ that are true exactly of the same individuals, but are (conceptually) distinct: $\exists G \exists F (\forall x (F(x) \leftrightarrow G(x)) \wedge (G \neq F))$.

These, however, are two concessions Quine is not willing to do. As we have seen, the absolute generality of the domain of quantification (3) is a consequence of the thesis of the univocity of being (1) and of its translatability into existential quantification (2). So, rejecting (3) requires a rejection of either (1) or (2). But (1) and (2) are among the most basic principles that underlie his entire philosophical project. (1) is his most basic metaontological thesis and (2) is his most basic methodological thesis.

The other possibility of avoiding Russell’s paradox in second-order logic is also not an option for Quine. Giving up extensionality is to abandon the principle of individuation he considers the minimum requirement for acceptance of any entity, his standard of ontological admissibility, which is founded on the principles of identity, mainly on the indiscernibility of identicals. The most obvious clue for Quine that a supposed entity doesn’t exist presents itself when the principle of substitutability *salva veritate* is violated in statements containing terms intended to refer to these supposed entities. In other words, if the assumption of some supposed entities in our ontology requires an intensional semantical context, then this is the best evidence we can have of the non existence of those entities (Alves, 2011, 35–36). As his other famous slogan says, “*no entity without identity*” (Quine, 1981a, 102).

[W]hat sense can be found in talking of entities which cannot meaningfully be said to be identical with themselves and distinct from one another? (Quine, 1963c, 4)

Extensionalism is a policy I have clung to through thick, thin, and nearly seventy years of logicizing and philosophizing (Quine, 2008, 215)

The only choice left to Quine to avoid paradoxes without giving up his most basic theses is, therefore, to restrict theory regimentation to first-order classical logic, abandoning both, second order quantification and intensional contexts. But that does not mean assuming a nominalistic position that simply denies the existence of any abstract entity. Quine accepts and even argues for abstract entities, provided they are extensional. (Quine, 1963a, 115).

[M]y extensionalist scruples decidedly outweigh my nominalistic ones. (Quine, 1986, 397)

But the only legitimate abstract entities Quine accepts are obtained by transforming an equivalence relation into identity. In this case, the class of indiscernible individuals according to the equivalence relation (the equivalence class) is individuated as a single abstract object whose nature is different from the nature of the indistinguishable individuals that compose it (Quine, 1963a, 117). If, for example, our individuals are three-dimensional physical objects and we aggregate them in equivalence classes composed of objects with the same volume, then to treat this volumetric equivalence as identity represents a change of ontology. It means stop talking about concrete three-dimensional physical objects and start talking about abstract volumes. Whatever property such an equivalence class has, or relation it engages in, it will be a property or relation of an abstract volume, not of concrete physical objects. The individuation movement that reifies this abstract entity is obviously driven by the principle of identity of indiscernibles, and it is allowed by Quine only because it respects the principle of indiscernibility of identicals, which is a criterion for extensionality.

So, to ensure that our theories can deal with these abstract entities which, in turn, comply with the restrictions of extensionality, Quine enriches the language of canonical notation with a binary predicate for membership, ‘ \in ’, and adds the axioms of his set theory **NF** (Quine, 1963b) to the ones of first-order classical logic.¹ This is, according to him, the only formal system we need for all theoretical discourses.

Our theories then ontologically commit to abstract entities only when they are explicitly regimented in **NF** as classes. When we say, for instance, that some dogs are white through the following regimented sentence,

$$\exists x (\text{Dog}(x) \wedge \text{White}(x))$$

we do not commit ourselves to abstract entities such as dogness or whiteness. To assume such commitments, according to Quine (1963a, 113), we have to interpret dogness and whiteness as classes and state that something is a member of both of them:

$$\exists x (x \in \text{dogness} \wedge x \in \text{whiteness})$$
²

So regimented, however, abstract entities are constrained by theory **NF**, which while keeping them both extensional and protected from paradoxes,³ it accepts the universal set and it is, therefore, compatible with thesis (3) of unrestricted quantification, which is so fundamental to Quine.⁴

This helps us understand another heavily criticized issue of Quine’s philosophy: his insistence on the extensionality of ontological commitments. If the formal methods Quine accepts for theory regimentation avoid intensional contexts, and if the ontological commitments of a theory are certain values of its variables, those who are required for the truth of the theory’s statements, then, as much as the values of variables are protected from intensionality, the ontological commitments should also be so protected. It was probably this trivial reasoning that led Quine to say without further arguments that “the question of the ontology of a theory is a question purely of the theory of reference” (Quine, 1951, 15).

However, discourses on values of a theory’s variables are local, they are concerned

¹ Moreover, Quine removes individual constants from canonical notation, adopting Russell’s theory of descriptions as a substitute for singular terms. Thus, variables become the only vehicle for reference, which assures formal correction to its famous motto about being: “*to be is to be the value of a variable*”.

² I use ‘dogness’ and ‘whiteness’ as names for the classes of dogs and white stuff respectively, just to shorten the formalization in canonical notation, which by requiring the removal of names and their replacement with descriptions, would have the following longer and less elegant form:

$$\exists x (\exists y \forall z ((\text{Dogness}(z) \leftrightarrow y = z) \wedge x \in y) \wedge \exists u \forall w ((\text{Whiteness}(w) \leftrightarrow u = w) \wedge x \in u))$$

There are ontological commitments to the classes of dogs and white things (dogness and whiteness) because these classes are the values of the variables ‘y’ and ‘u’ required to make the sentence true. It is worth noticing that ‘Dog’ is the predicate satisfied by only and all dogs and ‘Dogness’ is the predicate satisfied by only one entity, the class of all dogs. I.e., $\exists y \forall z ((\text{Dogness}(z) \leftrightarrow y = z) \wedge \forall x (\text{Dog}(x) \leftrightarrow x \in y))$. The same holds for ‘White’ and ‘Whiteness’.

³ Up to now nobody has found any contradiction in **NF**, but as a consequence of Godel’s theorem we know that without compromising suppositions there is no way to ensure that any formal set theory is consistent (free from contradictions and paradoxes). So, the protection against paradoxes that **NF** or any other set theory provides isn’t perfect. But it is as good as it can be.

⁴ The formalized set theory most commonly used is Zermelo-Fraenkel set theory which, however, would not serve Quine’s purposes because its methods to avoid Russell’s and other paradoxes preclude the admission of a universal set and therefore impose restrictions on the domain of quantification.

only the theory and need not be relativized. They are internal and its intelligibility requires no metatheory. To this extent Quine's precaution protects them from intensionality. On the other hand, discourses on ontological commitments are external to the theory. They occur in ontological debates whose reasoning demands a metatheory with more sophisticated formal tools than Quine allows for theories themselves.

It is not difficult to see that the very same phenomenon of referential opacity Quine uses to reject first-order modal logic (Quine, 1963d) occurs with the notion of ontological commitment. If we try to theoretically accommodate the notion of ontological commitment under Quine's extensional canonical notation we immediately get in trouble. Suppose, for instance, an ontological debate between the holders of these two theories:

$$\begin{array}{ll} \mathbf{T}_1 & \exists x \text{ Angel}(x) \quad \text{---} \quad (\textit{There are angels}) \\ \mathbf{T}_2 & \neg \exists x \text{ Angel}(x) \quad \text{---} \quad (\textit{There are no angels}) \end{array}$$

If we try to state this debate in an extensional theory of ontological commitment formalized on Quine's canonical notation, the views of these two theories' proponents could be stated respectively as: ⁵

$$\exists y \exists x (\text{Angel}(x) \wedge \text{ComT}_1(y) \wedge x \in y) \tag{4}$$

$$\exists z \forall x ((\text{Angel}(x) \wedge \text{ComT}_2(z)) \rightarrow x \notin z) \tag{5}$$

But as a simple logical consequence of (4) and (5) we have:

$$\exists z \exists x (\text{Angel}(x) \wedge \text{ComT}_2(z) \wedge x \notin z) \tag{6}$$

However, (6) does not do justice to the position of the holders of \mathbf{T}_2 . They would immediately disagree that there are angelical things they don't assume as ontological commitments. In fact, it was exactly this disadvantageous situation of claims of non-existence in an ontological debate that motivated Quine to propose the notion of ontological commitment at first place (Quine, 1963c). ⁷

This illustrates that in ontological debates we cannot treat ontological commitments the same extensional way we treat the values of interpreted theory's variables. Values

⁵ There are many different forms to express in an extensional way the relation of a theory \mathbf{T}_i to its ontological commitments. I just choose to use predication $\text{ComT}_i(y)$ to characterize that y is the class of the ontological commitments of \mathbf{T}_i , and to use \mathbf{NF} 's membership relation to state that the members of the class y such that $\text{ComT}_i(y)$ are exactly the ontological commitments of \mathbf{T}_i .

⁶ We can see that (5) is a fair way to state \mathbf{T}_2 's holders view because besides assuring that there are no angels among the ontological commitments of \mathbf{T}_2 , (5) itself doesn't assume any commitment with angels while saying that. It says that truly even when the extension of 'Angel' is empty.

⁷ Someone could protest, saying that we should have to have two predicates for angels, 'Angel₁' in \mathbf{T}_1 and 'Angel₂' in \mathbf{T}_2 . If so, sentence (6) would turn into (6'): $\exists z \exists x (\text{Angel}_1(x) \wedge \text{ComT}_2(z) \wedge x \notin z)$, which is committed with the existence of angels in \mathbf{T}_1 's sense, but not in \mathbf{T}_2 's sense. In such a situation the ontological foes have two options: they can agree on the equivocality of their debate. They are not talking about the same thing. But such agreement implies (through (6')) that \mathbf{T}_2 's holders concede that angels in \mathbf{T}_1 's sense do exist. Then, the debate has changed nothing on the view of \mathbf{T}_1 's holders. It is a victory for them. The other option is denying the equivocality of the debate. There are no two different senses of angel. Then, we don't need two predicates 'Angel₁' and 'Angel₂', but only one, 'Angel', which take us back to the situation where (6) ensures again the victory for \mathbf{T}_1 's holders.

of variables can be thought extensionally as the things themselves, but ontological commitments can't. Otherwise, the metatheory would ontologically commit itself with all commitments of the debating theories, and this would not help to solve the debate in a neutral way. Such an extensional notion of ontological commitment would be completely useless. It would let Quine in the same situation from where he started: hung on Plato's beard.

When I say that theory T_1 is ontologically committed with angels, I'm not talking about angels, after all they may not exist. Instead, I'm talking about concepts, intentions, meanings of angels. And as Cartwright (1954), Scheffler and Chomsky (1958), Parsons (1967), Jubien (1972), Chateaubriand (2003) and others have shown, there is no way to make clear this difference in an extensional theory like NF.

Therefore, although regimentation resources allowed by Quine ensure that ontologies of all regimented theories are extensional, still the notion of ontological commitment will not be, because it requires us to put the theories and entities they assume into perspective, in a situation where they can be compared in the same way we do in an intensional semantics of possible worlds. Wherever we have formal resources strong enough to describe different universes and to compare them and the way they affect truth and falsity of sentences, we will be out of extensionality. These resources are not only required by first order modal logic, they are also a minimum requisite needed to make any discourse about ontological commitments intelligible. Thus, even in a situation where all admissible ontologies are extensional, there is no way to present an intelligible notion of ontological commitment that is also extensional. So, the very same reason Quine has to reject first-order modal logic is a reason to reject the notion of ontological commitment.⁸

Perhaps because he realized this fact, after the end of the sixties Quine simply stopped talking about ontological commitments. Instead of trying to answer his critics, he focused his attention on proposing a minimalist and extensional ontology consisting only of classes, which he thought was suitable for all science. He didn't explicitly reject the notion of ontological commitment or change his view on the subject, but, as suggested by Chateaubriand (2003), he regarded the discourse on ontological commitment as just a way of talking. If discourses about ontological commitment require intensional contexts, then these discourses can't be regimented in his canonical notation and therefore they are not theoretical. They are, at best, just a loose way of talking.

But this is a serious issue for Quine, because his notion of ontological commitment is the main methodological tool he designed to assure rationality to ontological debates. Giving up ontological commitment is to abandon the possibility of presenting a rational and conclusive philosophical argument that decides on alternative ontologies. No wonder that the ostracism Quine put the notion of ontological commitment began in the same period in which he proposed his views on the inscrutability of reference and ontological relativity. As his famous proxy function argument has settled, in many cases "there can be no evidence for one ontology over against another" (Quine, 1992, 8).

Quine's entrenched "extensionalist scruples" are responsible not only for his rejection of first-order modal logic and of higher-order logic. As we just have seen, they are also the reason why he lost interest in the notion of ontological commitment and adopted the thesis of ontological relativity. Not only that, extensionalism is also a major

⁸ We, of course, don't need to do that, as Church (1958) showed, even being intensional the notion of ontological commitment still useful and fundamental to ontology. Quine's extensionalism, however, leaves him no other option but abandon it.

motivation for Quine to reject the distinction between analytic and synthetic judgments. According to his famous arguments from “Two Dogmas of Empiricism” (Quine, 1963e), such a distinction would depend on the establishment of a theory of meaning founded on a notion of synonymy whose intelligibility would be extensionally unscrupulous by requiring an intensional context.

But why Quine advocates so fundamentally this demanding thesis of extensionality, rejecting any notion that contravenes it? We have already seen that Quine uses extensionality as a standard of ontological admissibility, excluding any supposed entity whose intelligibility requires intensional contexts. Our question now is why does he do it? Being extensionality such a demanding thesis that leads to all these controversial rejections, what kind of gain it offers? What justifies Quine’s extensional scruples?

I’ll answer this question in two steps. First, Quine’s defense of extensionality and consequent rejection of the notions of meaning theory and of everything that requires intensional contexts can be understood as a more fundamental compromise with thesis (1) of univocity of existence. Any formal treatment of intensional contexts requires one of the following alternatives: (a) a logic explicitly of higher order (second or greater) and, along with it, the typifying of variables and the irreconcilable separation of distinct domains of quantification that is necessary to prevent Russell’s paradox; or (b) the use of non-truth functional operators whose occurrence in formulas introduces contexts of referential opacity, whose quantification into, as in ‘ $\exists x \Box P(x)$ ’, demands the admission of more subtle modes of existence that are distinct from the mode of existence of actual entities. Alternative (a) is a direct violation of thesis (3) therefore it violates at least one of its premises: theses (1) or (2). But the own statement of alternative (a) is according to thesis (2), after all we are talking there of a formal treatment whose quantifiers and variables are our ontological resources. Then, it is clear that alternative (a) violates the thesis (1) of univocity of existence. It is also clear that alternative (b) violates (1) too, because if we live in a world where there are no angels, but there could have been, then the status of angels as non-actual but possible existent beings is a sense of existence clearly different from the sense of my or your existence, which is actual.

This leads us to the second step of our response, which starts with another question: why Quine advocates in such a fundamental way the thesis (1) of univocity of being? Why not admitting alternative modes of existence catchable by distinct domains of quantification? It would suffice to accept this possibility to be allowed accommodating both intensional contexts and the use of higher-order logic. This not only could soften a little the austerity of his narrow canonical notation, as well as it could free him from several criticisms, objections and prohibitions.

One possible answer lies in the naturalism of his conception of philosophy. Quine’s naturalism means mainly that he sees no essential distinction between philosophy, mathematics, and science. Philosophy does not legislate or regulate science or mathematics, but collaborates with them.

[I]t is within science itself, and not in some prior philosophy, that reality is to be identified and described. (Quine, 1981b, 21)

The philosopher’s task differs from the others’ then in detail, but in no such drastic way as those suppose who imagine for the philosopher a vantage point outside the conceptual scheme he takes in charge. There is no such cosmic exile. (Quine, 1960, 275)

We can interpret that violation of thesis (1) contradicts naturalism. The admission of distinct ways of being that could be addressed by different sorts of variables confined to distinct types of quantifiers, which therefore would not be absolutely generic, opens space for a fundamental separation between philosophy and the rest of science. While to science would correspond the sense of being connected to individuals, actual beings and extensional abstractions, to philosophy would fit the sense of being connected to intensional contexts, meanings, and non-actual universes. The incommunicability between the domains of quantification could protect and insulate philosophy in an inadmissible “cosmic exile”.

For Quine there is no place for philosophy outside the same conceptual scheme we use to do science. As much as (and for the same reasons that) we can change our scientific theories and paradigms, we can also change our philosophical claims. There is no analyticity nor *a prioriness* protecting philosophical claims from possible revision. But if we allow multiple modes of being, if we give up the univocity of existence, then we open room for this kind of separation. The realm of intensional beings, for instance, would be untouchable by recalcitrant empirical observations. It would demand another way of thinking, another conceptual scheme, which is forbidden by Quine’s naturalism.

In short, the two steps of our answer to the question of why Quine defends extensionalism so strongly is that (i) extensionalism is required to ensure the thesis of the univocity of being and (ii) the univocity of being, in turn, is required to ensure naturalism, which is his most fundamental metaphilosophical thesis.

But, as we have seen in the case of ontological commitments, it is not that easy to constrain our philosophical discourses to the same conceptual scheme Quine has devised for science and knowledge in general. Even under his austere regimentation requirements, intensionality and the need for separation of modes of being shows up in most of the philosophical discourses we engage.

We could, therefore, to accuse him of trying to remove from the scope of philosophical considerations legitimate questions that not only should be there, as have been there throughout history. After all, we *conceptualize* and we *mean*. Not only that, we also think, consider, believe, forbid, doubt, theorize, allow, conceive, admit, *assume* and so many other things that lead us to intensional contexts.

When confronted with such charges, Quine’s answer is radical, almost impolite. It is a stark commitment to naturalism, which justifies us to regard it as his most fundamental thesis and reminds us that, despite having exceeded the ideas of logical positivists in many ways, he kept for himself the same project of philosophy that inspired the investigations of his teacher Carnap and other philosophers of the Vienna Circle:

If certain problems of ontology, say, or modality, or causality, or contrary-to-fact-conditionals, which arise in ordinary language, turn out not to arise in science as reconstituted with the help of formal logic, then those problems have in an important sense been solved: they have been shown not to be implicated in any necessary foundation of science. [...] Philosophy of science is philosophy enough. (Quine, 1953, 446)

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