

WHAT IS WRONG WITH NEGATIVE PROPERTIES*

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Abstract: Negative properties, like *not flying*, are controversial. I introduce negative properties, and offer semantic arguments against the inclusion of such properties in ontology. I distinguish predicate negation and sentential negation, and examine the syntactic and semantic behaviour of predicate negation. I contend that predicate negation is identical with sentential negation. If it is not, then we lose a lot of intuitive inferences found in natural languages and make no clear metaphysical gain. Other arguments based on Ockham's razor are offered. Finally, I address the problem raised by words like "immortal". These words apparently express negative properties. My views have interesting consequences on the ontological scope of these words.

Key-words: Metaphysics. Properties. Negation. Semantics. Logic.

In *Logical Forms* (2001), Chateaubriand offers a firework for logically minded ontologists. He also invites the reader either to question or to develop very fundamental philosophical assumptions. I want to examine a specific point: negative properties. I focus on Chateaubriand's

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view, and I do not consider other philosophers' views¹. In Chapter 2, the author argues in favour of what I will call negative properties and negative relations. He writes

(...) there is no clear sense in which having the relations 'is in' to something is more real than having the relations 'is not in' to something. Not being in my living room is as much a real relation to the living room as being in the living room. Similarly, to say that nothing instantiates the property of being an elephant in my study right now is to say that *everything instantiates the property 'is not an elephant in my study right now'*. (p. 49; my italics)²

For example, the negative predicate 'not sick' would express the negative property of *not being sick*, and the relation 'not in love with' would express the negative relation of *not being in love with*. Chateaubriand calls negative properties and relations simply properties and relations. I add 'negative' for clarification. The question I want to address is: Do expressions of the form 'not *F*' for example, where '*F*' is a predicate, express properties? I will set aside for now terms like 'immortal' and 'unconscious'. *Prima facie*, such adjectives express properties: *being immortal* and *being unconscious*. On the other hand, 'immortal' and 'unconscious' are intuitively equivalent to 'not mortal' and 'not conscious'. If so, 'immortal' expresses a negative property, *not being mortal*, and 'unconscious' expresses a negative property, *not being conscious*. My view on expressions of the form

¹ This paper was initially intended as a contribution to a special issue of *Manuscrito* on *Logical Forms*. Things changed, and it got bigger and bigger. It is still intended as a study on Chateaubriand's book, or more precisely, on some positions Chateaubriand argues for in his book. I remember my first meeting with Oswaldo. We sat and argued for hours. I went to bed, and did not sleep much. I was still thinking about Oswaldo's arguments. The next morning, I sat with him and we continued the discussion. We had great time. This paper is longer than expected because his ideas just 'stay in my mind' somewhere, and because I really want to convince him. I had a great time writing it, and I hope that he will enjoy reading it.

² See also pp. 49-50.

'not *F*' will have consequences on our view of the ontological scope of terms like 'immortal'. I will come back to them at the end of my paper.

Negative properties and negative relations play an interesting role in the economy of *Logical Forms*, expanding the range of facts to include negative facts (like *Peter is not sick*), and intersecting with the issues of logical form as well as truth and falsity. The issue of negative properties and relations is a classical but neglected theme, and Chateaubriand brings an interesting topic to the foreground. I will explore that domain with the map Chateaubriand provides as a guide. Even if I am sympathetic to properties and relations, I want to raise some objections for countenancing negative properties and negative relations. Given the nature of the topic, and to my mind, the lack of specifics in that field, my criticisms and my conclusions as well are tentative. Now, I do not want my paper to have a purely negative aspect, and take it as an apology for the sentential negation we all know and tend to underrate. Sentential negation is a very efficient tool for trimming ontological fat. Rather than believing that negation increases the ontological load, I argue that it helps to keep the world clean and clear. I also introduces a look 'from the other side' in ontology. Starting with negative properties, rather than properties, we are brought back to very simple questions concerning the relationships between language and ontology, and at the end of the day, concerning properties. Let me first set the stage.

Negative Properties. Properties are entities introduced to account for some issues. How can we explain the truth of 'Peter is sick'? By saying that this sentence is true if and only if Peter exemplifies the property of *being sick*. Why is he home? Well, because being sick causes him to stay home. Analytic ontology is an engine fuelled by semantics and worldly relationships. Chateaubriand presses semantics and truth, neglecting worldly relationships. He also insists on negative predicates and negative properties. The latter can *prime facie* account for the truth of some statements. To repeat, I assume that if '*F*' is a predicate, and 'not' a predicate

negation, then ‘not *F*’ is a negative predicate. Consider negative predicates like ‘not a dentist’ or ‘not flying’, and suppose that these predicates express negative properties like *not dentist* and *not flying*. The first section of my paper examines these predicates and the alleged corresponding properties. According to that picture

(1) Quine is not a dentist

is true if and only if Quine exemplifies the property of not being a dentist or, alternatively, Quine exemplifies the property of being a non dentist. I will come back to these truth conditions later on. The property of *not being a dentist* is instantiated by everything, except by dentists. Pressure on ontological commitment comes from the requirement of an account for the truth of sentences. The second part of my paper will question this account of the truth of (1). Metaphysicians want entities to play a role in the world. Pressure on ontological commitment comes also from that quarter. As it goes, a criterion for accepting entities and types of entities is their indispensability in explanation. We want objects to entertain causal relationships in virtue of their properties; we want properties to be subvenient and others to be supervenient, and/or we want properties to compose and form new entities (objects in the Bundle Theory of Objects). Strawson (1974) and Armstrong (1978, 1989), among others, reject negative property and offer strong evidence showing that negative properties have no clear role in the world. I revisit and restate a strong version of that line of argument. The third part of my paper questions the relevance of negative properties.

Metaphysics is a very abstract topic and guidelines, methodological principles, are required. One of them is that metaphysics should cohere with a simple account of truth and the truth-conditions of sentences. My arguments will be grounded on a very standard notion of truth and on bivalence in semantics. In addition, metaphysicians usually follow one version or another of Ockham’s Razor: Do Not multiply

Categories of Entities Beyond Necessity. New categories of entities are required when the usual ones fail to capture a phenomenon, and they are not otherwise. I ground the arguments offered in the third section of the paper on the previously stated version of Ockham's Razor. Now, one may reject both methodological principles. I think that Chateaubriand sympathizes with a non standard, controversial notion of truth/falsity. He shows sympathy for a correspondence theory of truth, and for the idea that a sentence is true because of what is, being, and false because of what is not, or non being (see especially p. 49). That idea goes back to Plato, and Chateaubriand represents this tradition. He writes about 'Theaetetus is flying':

The statement that Theaetetus is flying also describes reality in the sense that it says of what is (Theaetetus, flying) that it is, thus and so. The thus and so is the participation of Theaetetus in the form Flying, which in this case is not an aspect of reality. Thus, the statement describes what is as it is not and is false. But the non-participation of Theaetetus in the form Flying is not a lack, a *nothing*; it is, rather, a participation in the form Other-than-Flying, which is a combination of the form Otherness with the form Flying. This is an aspect of reality as well, and a feature of Theaetetus; thus what accounts for the falsity of the statement is a feature of reality. (p. 50)

Hence, 'Theaetetus is flying' is false since Theaetetus participates in the form Other-than-Flying. This is a non standard explanation of the falsity of that sentence. It also explains why 'Theaetetus is not flying' is true. This is also a non standard account of the truth of this statement. In addition, Chateaubriand rejects Ockham's Principle.

I endorse the guidelines just stated and my arguments are grounded on them. My conclusion will be conditional: If we want to preserve a simple, non controversial picture of truth, and if we follow Ockham's razor, then we should be very reluctant to countenance negative properties in our ontology. I offer no argument backing these guidelines. That would be the topic of a different paper.

My paper has the following structure. I offer arguments, old and new, suggesting that (i) negative predicates are in need of explanation and justification, (ii) if the argument backing their acceptance is semantic in nature, then it is arguable that semantics can and should dispense with them. My arguments in these two sections are semantic in nature. Finally, (iii) even if we accept negative properties, we have good reasons to believe that they are metaphysically inert, introducing no indispensable properties and playing no role in the worldly economy. Negative properties are idle wheels. However, my arguments leave untouched the idea that predicate calculus reflect the structure of reality. There are objects and properties. Yet, negative predicates do not express properties.

Do Negative Properties Have A Structure? Let us go back to negative predicates. Armstrong defines a negative universal by saying that if U is a universal, then *not* U is a negative universal (Armstrong 1978, p. 173). Of course, he denies the existence of negative universals, and that entities of the form *not* U exist. According to Chateaubriand, if ' F ' is a predicate expressing a property F then '*not* F ' is a negative predicate expressing a new, negative property or universal *not* F . According to Chateaubriand's picture, universals do not have to be exemplified.

' F ', as well as the property it expresses, can have a rich structure. For example, 'is in a red car' is structured. Does '*not* F ' have a structure beyond the structure of ' F '? If so, what is the contribution of '*not*'? I want to focus on this question. One must be careful here and avoid supposing, without argument, that predicate negation behaves syntactically and semantically like sentential negation. It is assumed that sentential negation obeys the following rules. The first rule is a syntactic rule

Sentential Negation

Syntactic Rule (i) If \mathcal{A} is a sentence, then *not* \mathcal{A} is a new sentence.

Of course, if '*not* \mathcal{A} ' is a sentence, then '*not not* \mathcal{A} ' is a sentence, and so on. Sentential negation is lexicalised in different ways in natural lan-

guages: 'It is false that' or 'it is not the case that', and so on. For example, if 'Peter is sick' is a sentence, and so is 'It is false that Peter is sick', and 'It is false that it is false that Peter is sick', and so on. The second rule is a semantic rule, giving the meaning of the sentential negation:

Semantic Rule (ii) If A is true (false), then not A is false (true).

From a standard, semantics relies on bivalence, and the latter is reflected in Semantic Rule (ii). Finally, we have a third rule

Semantic Rule (iii) A is equivalent to not not A .

For example, 'Peter is sick' is equivalent to 'It is false that it is false that Peter is sick'.

What about predicate negation? I will note this negation by 'NEG'. The syntax of predicate negation is easy to state. It is not a sentence connective but a predicate modifier.

Predicate Negation

Syntactic Rule (i) If F is a predicate, then NEG F is a new predicate.

Such syntactic rule coheres with our notion of a negative predicate. That rule is just a formation rule ignoring the syntactic category of 'NEG'. Of course, one must be careful not to read 'NEG' as a connective. As distinct from sentential negation, for example, predicate negation can not be read as 'it is false that' or 'it is not the case that', and it can not generate scope distinction. Now, according to the rule, if 'NEG F ' is a predicate, then 'NEG NEG F ' should also be a predicate. This raises problems to which I will come back to, in a few lines. Finally, 'NEG' does not add any condition to the sentence, and cannot be an adjective.

Is it an adverb? Is it a prefix? Or what? Its semantics is still more controversial.

Corresponding to the negation's semantic rule (ii) we plausibly have the following

Semantic rule (ii) If Fa is true (false), then NEG Fa is false (true)

where ' Fa ' is a sentence. I will come back to that rule later on. The first question I want to raise concerns semantics and what would be the counterpart of the semantic rule (iii) for sentential negation:

Semantic Rule (iii) Fa is equivalent to NEG NEG Fa

Are ' Fa ' and 'NEG NEG Fa ' equivalent? First, is 'NEG' reiterable? Does the (recursive) syntactic rule (i) hold for predicate negation? I am reluctant to assume that it does without an argument. The connective can be reiterated, and that feature is cashed out in both its syntax and its semantics. For example, 'not A ', 'not not A ' and 'not not not A ' are all well-formed formula whose semantics is straightforward. It is natural to assume that predicate negation does share these features, but unless one is more specific with the syntax and semantics of 'NEG', and in the absence of an argument, this is just an assumption. Chateaubriand is mute on that topic. Let us examine the two relevant options.

Suppose that it is reiterable, and, in that respect, syntactically similar to sentential negation. Then, neglecting the syntactic rule, one wonders whether reiteration's impact on semantics is similar in the case of both connectives and predicate negation, and whether or not ' F ' and 'NEG NEG F ' are equivalent and express the same property. Suppose that one opts for the semantic similarity and accepts the following

Semantic Rule (iii) Fa is equivalent to NEG NEG Fa .

According to that picture, predicate negation and sentence negation semantically collapse: ' Fa ' and 'NEG NEG Fa ' always have the same truth conditions, just like ' A ' and 'not not A ' have the same truth conditions. By the same token, I assume that the Semantic Rule (ii) for predicate negation follows. If so, 'NEG' and the sentential connective collapse. Strawson (1974), for one, introduces predicate negation and concludes that semantically, such a negation does not introduce any ontological difference since 'not Fa ' will be logically equivalent to 'NEG Fa ' (Strawson, 1974, p. 6 and page 115) and vice-versa, that is, 'not Fa ' and 'NEG Fa ' will be true under the same conditions. For instance, (1) would be true if and only if Quine instantiates the relevant negative property, or, alternatively, if and only if it is false that Quine is a dentist³. The second option, (1) is true if and only if it is false that Quine is a dentist, should be favoured on grounds of ontological economy – negative properties are not invoked. It also makes predicate negation redundant. Under these conditions, predicate negation is legitimate but redundant and ontologically inert in so far as it just mimics the semantics of the sentential connective. It would not do the job Chateaubriand asks it to do, namely, to introduce negative properties, negative relations, and negative facts. So, in my understanding, this is not an option for Chateaubriand, because the semantic properties of predicate negation would have no ontological impact.

Suppose now that, assuming syntactic rule (i), one answers that sentential and predicate negation differ semantically and holds that the Semantic Rule (iii) is not the appropriate rule for Predicate negation. One would then turn to the following

Semantic Rule (iii)' Fa is not equivalent to NEG NEG Fa .

According to that picture, ' Fa ', 'not not Fa ', on the one hand, and 'NEG NEG Fa ', on the other hand, have different truth-conditions. If so,

³ Chateaubriand, at one point, seems to endorse this view (p. 113).

predicate negation is semantically distinct from the sentential connective and behaves semantically in a very specific way. One can assume that it does not operate on sentences but on predicates, and generates new predicates. If predicates are echoed by properties, then we have a mechanism for generating new properties, $NEG F$, $NEG NEG F$, $NEG NEG NEG F$ and so on, irreducible and all different. Chateaubriand writes for example that ‘not flying is a real property’ (pp. 49-50). He does not mention *not not flying*, the option I am examining.

If ‘NEG’ and the connective semantically differ, then it is possible, in principle, that ‘not Fa ’ and ‘NEG Fa ’ differ in truth-value. That is ‘It is false that Peter is sick’ could be true and ‘Peter is not sick’ could be false or vice-versa. This is a very counterintuitive result, to say the least. But let it pass. I want to emphasize that in some passages Chateaubriand seems to reject this consequence. Finally, if ‘ F ’ and ‘NEG F ’ express different properties, then an object can, *in principle*, exemplify the properties F and $NEG F$, thus, negating the semantic rule (ii) for predicate negation. For example, an object could be both a dentist and a non dentist. Such results are not intuitively acceptable. It is also bad news for Chateaubriand, since it is then in principle possible that ‘Theaetetus is flying’ is true, and that ‘Theaetetus is not flying’ is also true since ‘to fly’ and ‘not to fly’ are two predicates expressing different properties, and there is no reason why exemplifying one excludes exemplifying the other. If this consequence follows, it goes directly against what Chateaubriand writes on page 50 (see quotation): the truth of ‘Theaetetus is not flying’ can not account for the falsity of ‘Theaetetus is flying’ since both statements can be true, or false, at the same time. In the absence of details on the semantics of the predicate negations we are bound to draw these consequences. Once again, in some passages, Chateaubriand seems to reject these consequences.

Does ‘NEG F ’ have a structure? ‘Being a customer in a restaurant’ is plausibly a complex structured predicate expressing a complex structured property, involving the property of being a customer, the

relation 'in', and the property of being a restaurant. Each component of the predicate is echoed in the property. If 'NEG *F*' is a structured predicate, then each of its components is plausibly echoed in the property it expresses. Now, what can echo 'NEG' in the world? What is the ontological difference between *being a dentist* and *being a non dentist* or *not being a dentist*? How does *non* and *not* fit in and what do they introduce exactly? One does not want to say that negation is in the world. And arguing that it is part of the world on grounds of negative properties is an *ad hoc* position. Looking at it from a different point of view, one can plausibly argue that 'NEG' does not add any component and is inert with respect to the structure of the property. 'NEG *F*' is then just a new, brute property part of the furniture of the world. According to my understanding, this means that 'NEG *F*' is not compositional. If it is not, your understanding of 'not' as a negation with syntactic and semantic properties is an illusion: the 'not' in 'not *F*' is more like 'ee' in 'cheese' than 'language' in 'metalinguage'. Then, however, the syntactic and semantic rules for 'NEG' have no application.

Assume that *NEG F* is a new, brute, unstructured property. If *F* is a brute property and if *NEG F* is a new brute property, then one can know what *F* is without being able to say what *NEG F* is and vice-versa. The same goes for *F* and *NEG NEG F*, *NEG NEG NEG F*, and so on. I find this consequence troublesome. I do not see how reiterating 'NEG' can create predicates echoing properties we totally lack cognitive access to. According to Chateaubriand and most philosophers, properties are important in identifying objects. Now, if negative predicates are not compositional, one wonders what these properties are, how we can cognitively access them, and how the property then expressed can be relevant in identifying objects. In addition, negative properties become very similar to ordinary properties, and one can hardly explain their negative aspect by referring to the fact that they are expressed by a negative predicate. We now have brute predicates and we have lost negation. And as far as ontology is concerned, such properties could be

expressed by ordinary predicates. My criterion for negative predicates and negative properties is syntactic and compositional: 'NEG' is a predicate negation, and 'NEG *F*' is a structured, compositional predicate. If 'NEG' is not, then 'NEG *F*' is just a new non negative predicate. I have nothing to say about these predicates and doubt that one can make sense of them.

This raises interesting issues concerning the nature of properties, and especially on the existence of the properties that terms like 'invisible' and 'unreliable' for example, would express. Do they express negative properties? Is 'invisible' just 'not visible' or, in the language I introduced, 'NEG visible'? What makes these terms negative? And if they express negative properties, how do ordinary properties differ from the properties these terms express? And what does 'NEG' semantically contribute to the semantics of these terms. The questions raised at the beginning of the paper become more pressing. Suppose that it is not reiterable. Then, it is clearly syntactically distinct from the sentential connective, and to give both its syntax and its semantics remains to be done. I will not examine that option for now, but I will make a suggestion in the last section of the paper.

Let me suggest a different, plausible interpretation for the negative predicate 'NEG *F*'. Instead of talking about properties, one should approach expressions of the form 'NEG *F*' in terms of class. It is my understanding that if *F* is a class of objects, and if one really want to introduce something like predicate negation, then 'NEG *F*' does not denote the class of *non F*, but simply the complement class of *F* – all those objects that are not *F* (see Copi 1968, p. 136). In terms of class, (1) is true if and only if Quine is a member of the complement class of the class of dentists. However, handling predicate negation in terms of complement class deprives negative predicates of ontological scope and is easy to translate in sentential terms.

Do Negative properties Have a Semantic Role? What are the truth conditions of (1)? We have two options

* ‘Quine is not a dentist’ is true if and only if
Quine instantiates the property of not being a dentist

or, alternatively

Quine instantiates the property of being a non dentist

According to Chateaubriand’s picture ‘(...) the falsity of the statement that Theaetetus is flying is accounted by the truth of the statement that Theaetetus is not flying.’ (p. 50) Theaetetus cannot exemplify both properties. Chateaubriand endorses *. As I mentioned in the previous section, the idea that an object cannot exemplify both *F* and *NEG F* is unclear to me unless one reads predicate negation as sentential negation. In addition, NEG, not being a sentential connective, does not introduce scope ambiguity. Alternatively, one can have the following

** ‘Quine is not a dentist’ is true if and only if

It is false that $((\exists x) x = \text{Quine} \cdot x \text{ is a dentist})$

or

$(\exists x) (x = \text{Quine} \cdot \text{it is false that } x \text{ is a dentist})$

Here, ** introduces scope distinction, and we obtain two different but equivalent truth conditions. Sentential negation is a syntactic ambiguity inducer. Scope ambiguities are sometimes truth conditionally relevant. Consider the following

Peter does not believe that Quine is a dentist

The latter is multiply syntactically ambiguous

- i) $(\exists x) (x = \text{Quine} \cdot \text{It is false that Peter believes that } x \text{ is a dentist})$
- ii) $(\exists x) (x = \text{Quine} \cdot \text{Peter believes that it is false that } x \text{ is a dentist})$
- iii) It is false that $(\exists x) (x = \text{Quine} \cdot \text{Peter believes that } x \text{ is a dentist})$

If we have predicate negations then we lose this ambiguity. The sentence 'Peter does not believe that Quine is a dentist' would straightforwardly be read to assign to Peter the property of not believing that Quine is a dentist. This is an oversimplification, and does not capture our semantic intuitions. A simple tool like sentential negation induces scope ambiguity, and what looks like a negative property can be eliminated and accounted for in sentential terms.

Now, suppose that we keep 'NEG', lose syntactic ambiguity and try to keep what was captured by a specific reading of the sentence by introducing a new lexical item (predicate negation). According to Chateaubriand's picture, the falsity of

(2) Theaetetus is flying

is accounted by the truth of

(3) Theaetetus is not flying.

(Chateaubriand 2001, p. 50). As I mentioned, I do not think that this is an explanation at all, since (2) and (3) are compatible: if 'NEG' applied to 'F' introduces new predicates and new properties, (2) and (3) could be true (or false) at the same time. Finally, if we use bivalent semantics and standard negation, the relationship between (2) and (3) is very simple: they cannot be true at the same time, and they are true or false. If (3) is true, then it follows that (2) is false, and vice-versa: if (3) is false, then it follows that (2) is true. (3) is just the negation of the affirmative (2), and the truth of a negative sentence is hardly an account of the falsity of a

positive sentence. Bivalence is embedded in semantic rule (ii) for sentential negation and in the corresponding rule for predicate negation. One can reject bivalence and explore the new domain that has opened. I will not go further in that direction.

Let me mention one final problem in accepting predicate negation. If predicate negation's syntax and/or semantics differ from those of sentential negation, then, one must distinguish 'Not Fa ' and 'Neg Fa ', and such a distinction is erased in ' $\neg Fa$ '. So, let me distinguish between

Fa and the corresponding $\neg Fx$ for sentential negation
and

Fa and the corresponding \neg^*Fx for predicate negation

' \neg ' indicates sentential negation, and ' \neg^* ' indicates predicate negation. The former introduces scope distinction, and the latter does not, because it does not apply to formulas (open or closed). For example, and normally, 'It is false that Quine is a dentist' and 'Quine is not a dentist' have the form $\neg Fa$. The predicate negation's advocate would have two forms: 'It is false that Quine is a dentist' would have the form $\neg Fa$, while 'Quine is not a dentist' would have the form \neg^*Fa . The distinction shows up when one considers the scope of negation and the Quantifier Negation and Complex Quantifier Negation rules for first-order predicate calculus. The QN and CQN rules are inferences' rules

Quantifier Negation Rules

- (a) $\neg(x) Fx :: (\exists x) \neg Fx$
- (b) $\neg(\exists x) Fx :: (x) \neg Fx$
- (c) $\neg(x) \neg Fx :: (\exists x) Fx$
- (d) $\neg(\exists x) \neg Fx :: (x) Fx$

Complex Quantifier Negation Rules

- (a) $\neg(x) (Fx \rightarrow Gx) :: (\exists x) (Fx \rightarrow \neg Gx)$
 (b) $\neg(\exists x) (Fx . Gx) :: (x) (Fx \rightarrow \neg Gx)$
 (c) $\neg(x) (Fx \rightarrow \neg Gx) :: (\exists x) (Fx . Gx)$
 (d) $\neg(\exists x) (Fx . \neg Gx) :: (x) (Fx \rightarrow Gx)$

In reading the negation sign in a predicate as a sentential negation, one obtains (i) the usual logical form, (ii) the usual scope of negation and (iii) the QN and CQN rules. First order predicate logic can be used to examine sentences and inferences in natural languages. In reading the negation sign in a predicate as predicate negation rather than sentential negation, we lose (i)/(iii). First, predicate negation does not give the sentence its usual logical form. Second, predicate negation cannot have a closed or open formula in its scope, and much less two closed or open formulas. Third, from the second reason, it follows that we lose or cannot apply QN and CQN rules since they rely essentially on sentential negation, negation's scope and interaction between formulas. Consider (1). Let us follow the standard rules. From (1), by existential generalization, one gets the following

$$(\exists x) \neg Fx$$

or

There is an x such that it is false that x is a dentist

or, in a more familiar language

Someone is not a dentist

and by a quantifier negation rule, one can obtain

$$\neg(x) Fx$$

or

It is false for every x that x is a dentist

Or, in a more familiar language

It is false that everyone is a dentist

However, if one reads (1) as containing a predication negation, by existential generalization, one gets

$$(\exists x) \neg *Fx$$

or

Someone is not a dentist

but cannot move to

$$\neg * (x) Fx$$

The relevant QN rule applies to sentential negation, and there is none in the first formula, and in the second formula, however, the predicate negation applies not to a predicate but to a sentence, and by definition it does not apply to open or closed sentences. In fact, the second formula does not even make sense. For the first reason, one cannot even move from

(1) Quine is not a dentist

and simple logical rules to

$$\neg(x) \text{ is dentist } x$$

by using QN Rules. This is very counterintuitive, and leads to the loss of a lot of rather natural inferences. I invite the reader to consider examples using different QN and CQN rules. Going back to the quotation at the beginning of this paper, one can ask what is the inference rule used by the author to infer from ‘nothing is an elephant in my study right now’ or, in standard first-order predicate language

$(x) (x \text{ is an elephant} \rightarrow \neg x \text{ is in my study right now})$

that ‘Everything is not an elephant in my study right now’ or, by a complex quantifier negation rule

$\neg(\exists x) (x \text{ is an elephant} \cdot x \text{ is in my study right now})$

since QN and CQN rules do not apply.

Now, what would motivate favouring * over **?

* ‘Quine is not a dentist’ is true if and only if
Quine instantiates the property of not being a dentist

** ‘Quine is not a dentist’ is true if and only if
It is false that $(\exists x) x = \text{Quine} \cdot x \text{ is a dentist}$,

or

$(\exists x) (x = \text{Quine} \cdot \text{it is false that } x \text{ is a dentist})$

** is standard, well known and fits logic; * is not standard and is not required by logic. It also raises murky issues. As Aristotle mentions, ‘The expression ‘not-man’ is not a noun. There is indeed no recognized term by which we may denote such an expression, for it is not a sentence or a denial. Let it then be called an indefinite noun.’ In the actual context, ‘non dentist’ would not be a well formed-formula. In addition, it is not required by any decent ontology. From a semantic, logical point of view, * seems unmotivated if not totally wrong.

Do Negative Properties Have a Mundane Role? Chateaubriand puts non logical properties (properties not belonging to logical and/or mathematical entities) at the centre of the stage. So will I. Armstrong (1978) mentions that if negative properties exist, then, against all intuition, we are bound

to say that many objects resemble one another in exemplifying the property *not walking* for example – or, say, my car and the Corcovado resemble one another in exemplifying the property of *not writing philosophy*. However, this is not what I want to focus on. Mundane properties can be part of the causal net and/or the supervenience trade – some being supervenient and others being subvenient.

Negative properties lack specificity. ‘Black’ is a colour term, but ‘not black’ or ‘non black’ is not; ‘dentist’ names a job, and ‘non dentist’ does not. In addition, whatever negative properties are, they lack causal power. More cautiously, one can argue that science can explain all there is to explain without invoking negative properties, properties expressed by negative predicates of the form ‘NEG *F*’. I do not want to address the issue of the ontological category of *X* and *Y* in ‘*X* causes *Y*’ (events? objects? facts?), but suppose that events have causal power and that having specific positive properties is relevant to the causal power of an event and the causal chains it is part of. I also suppose that we want to capture these relationships in an explanation. Would adding negative properties to our ontology allow for explaining more than we already do explain? People break world records because they are in great shape, not because they instantiate properties like *not being ill*, and the property provides a good explanation while the negative property is vacuous enough. Such negative property also lacks the precision we want to find in laws. I contend that whenever one explains how an event causes another by invoking a negative property of the first event, it is possible to replace that negative property by a (positive) property and obtain a plausible explanation with a bonus: a law or would be law. It is hard to believe that one can state non-trivial laws by invoking negative properties. Moreover, it is easy to pointlessly populate the world with negative properties. As it goes, objects and events do instantiate a huge number of negative properties, if there is such a thing. However, the latter are not relevant in knowing objects and events: once you have the positive properties, negative properties add no extra purchase value.

Are they supervenient or subvenient properties? We are familiar with the idea that moral, mental or aesthetic properties supervene on physical properties. Can one argue that, first, negative properties are part of the subvenient base or, second, that negative properties supervene on a subvenient base? I do not want to advocate a version of any of these views. I suggest that supervenience is not improved by negative properties. For example, the idea that the negative property of not being made of wood is the subvenient base for a mental property is to me pointless as is the idea that my actual brain state determines my mental state of not dreaming of *Jimmy*. In addition, it is obvious that the latter property does not explain much of what I am doing. Finally, if properties compose to form object or sets of properties, I do not see how negative properties make a difference as to what an object is.

Truth and Facts. Let me go back to a motivation for negative properties: accounting for the truth or falsity of sentences like (1). Chateaubriand backs a Realist account of the truth/falsity of sentences. His picture fits, and is close to, the Correspondence Theory of truth. However, if there are no negative properties, then a category of facts, negative facts, those making true sentences like (1), vanishes. From my point of view, this is not a loss. These facts can be dispensed with, and they are costly, given the price of negative properties. (1) is true, and it is false that Quine is a dentist. By the same token, accounting for the truth or falsity of (1) is easy: it is true if and only if it is false that Quine is a dentist.

There are good reasons to reject the reading of ‘not’ as predicate negation as opposed to sentence negation, and no reason to tolerate negative properties. Let us now go back to a problem that emerged at the beginning of the paper.

‘Immortality’. Some terms are apparently negative predicates even if not of the form ‘NEG *F*’, like ‘not happy’ and ‘not flying’: ‘immortal’, ‘unconscious’ and so on. They are also widely seen as expressing negative

properties. ‘Immortal’ apparently means what ‘not mortal’ means, and is hence what I called a negative predicate expressing a negative property, *not being mortal*. However, things are more complicated.

I assumed that ‘NEG’ is reiterable (syntactic rule (i) for predicate negation) and did not consider the possibility of its not being reiterable. The prefix ‘im’ does not have ‘NEG’'s syntactic features. In distinction with ‘NEG’, ‘im’ is not reiterable – ‘imimmortal’ is not a word. In that respect ‘immortal’ is not ‘NEG mortal’ in my understanding of ‘NEG’ in this paper. By the same token, it seems to differ from sentential negation: the latter is reiterable. That does not imply that ‘Peter is immortal’ does not mean that ‘It is false that Peter is mortal’. It means that the prefix does not have all the syntactic properties of sentential negation. Let us suppose that ‘NEG’ is not reiterable, just like the negative prefix.

‘Im’ has negation’s features, and ‘immortal’ is not a new predicate expressing a brute, unstructured property, like ‘blue’. I submit that that prefix is a sentential negation from a sentence beginning with a negation sign followed by a sentence not containing negation, just like ‘it is false that Peter is mortal’. In that respect, I suggest that it does not introduce a new property, and that ‘Peter is immortal’ and ‘It is false that Peter is mortal’ are equivalent. The same goes for ‘Theaetetus is not flying’ and ‘It is false that Theaetetus is flying’. My suggestion is worth exploring. But a full examination of negative prefixes is well beyond the scope of this paper

We want ontology to be independent of language, and language to reflect the world rather than not vice-versa. Negation is *prima facie* part of language. If so, it is good policy to look for negation in language, and block its way to the world. That includes the negation ‘im’ in ‘immortal’.

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