ON QUANTITATIVE AND QUALITATIVE PARSIMONY
MACIEJ SENDŁAK

1. Introduction
When evaluating philosophical and nonphilosophical theories, one often focuses on their methodological virtues.* One of these virtues is simplicity, which is usually associated with the principle of parsimony, known as Occam’s Razor (OR). The principle itself has been put forth in various ways, but the most common formulation states:

(OR) Entities should not be multiplied beyond necessity.¹

Philosophers often refer to OR as the principle of economy of explanation, since according to this principle one should not believe in the existence of more entities than are necessary to explain a given phenomenon.² Because of this, when comparing two explanations (theories) of the same data, preference should be given to the one that is committed to a parsimonious (or simpler) ontology. Thanks to this we choose the more effective theory: that is, the one that allows us to explain phenomena without postulating superfluous entities.³

Although the principle itself is not a novelty, philosophical investigations in the twentieth century have shed new light on it. This includes the results of observations made by Willard van Orman Quine and David Kellogg Lewis. Quine drew a distinction between ideological and ontological parsimony (Quine 1951), whereas Lewis showed that there is an important difference between a quantitative and a qualitative reading of OR (Lewis 1973).⁴ The Lewis distinction is supposed to allow him to dismiss one of the charges against his theory of a plenitude of real, existing, possible worlds.

* Earlier versions of this material were presented in Warsaw (University of Warsaw) at “The Seminar of the Department of Analytical Philosophy” and in Cracow (Jagiellonian University) at “The 2nd Cracow Workshops in Analytical Philosophy.” I am grateful to the participants of these meetings for their helpful comments and discussions, especially to Tadeusz Ciecierski, Christopher Daly and Björn Lundgren. I would also like to thank the anonymous reviewers for this journal for their comments concerning the earlier versions of the paper. This material is based on the work supported by The Foundation for Polish Science under program “START 2017.”
In this paper I argue that while there is a difference between qualitative and quantitative parsimony, the distinction itself does not guarantee a successful reply to the charge of inflated ontological commitments. I believe that this will show that the quantity of ontological commitments of a given theory does not have to be less important than the quality of its commitments. Although I focus on the problem of the metaphysics of possible worlds, this should be regarded merely as a case study. Accordingly, the results of this analysis should find applications in other metaphysical debates as well.

2. Modal Realism and Occam’s Razor

Modal realism, or, as some call it, “possibilism” or “concretism,” is a well-known theory that delivers an analysis of modality in terms of the semantics of possible worlds. Although it is not the only theory that uses the notion of “possible worlds,” it is considered to be the most controversial. Its controversy lies in the metaphysical nature of possible worlds. According to modal realism, possible worlds exist on a par with the actual world that we are living in. So merely possible worlds are taken to be real, existing, spatiotemporal objects. Each of them exemplifies a possibly true description of the actual world, so every way that the actual world could be is a way in which a possible world is. The only difference between our world and the other worlds is that our world is the actual world. Our world is not, however, absolutely actual but is actual merely for those objects that are parts of this world. The other worlds, which are nonactual for us, are actual for those objects that are parts of them. In this sense, the term “actual” is taken to be an indexical term (Lewis 1970, 184–85). Nevertheless, actual or not, all possible worlds are considered to be spatiotemporal objects, and all of them exist in the broad sense of this term. Accordingly, modal realists believe in the real existence of actual as well as nonactual entities (Lewis 1986).

One of the main alternatives to this kind of realism is an approach that is often labeled “actualism” or “abstractionism” (van Inwagen 2001). According to this view, merely possible worlds are abstract entities that represent how the actual world could be. Such possible worlds are often taken to be maximal and consistent sets of states of affairs, among which we can distinguish sets of states that obtain and states that do not obtain (Plantinga 1979). The former correspond to the actual world, whereas the rest represent ways in which the actual world could be: that is, possible worlds. Similarly to modal realism, according to abstractionism the actual world as well as merely possible worlds do exist. The main difference between these two approaches is that the abstractionists do not believe in the existence of nonactual
spatiotemporal objects. By nonactual they merely mean abstract objects: that is, states of
affairs that do not obtain.

A common reaction to modal realism’s claim is the “incredulous stare” (Lewis 1986,
135–37). This arises in the face of the requirement to believe in the existence of
spatiotemporal nonactual objects. The “stare,” besides being a rhetorical expression of
skepticism about modal realism, results in a substantial argument against this theory. The
argument is meant to show that since modal realism implies the existence of a plenitude of
nonactual concrete objects, it has multiplied entities beyond necessity, and thus violates OR.
Because of this, from the methodological point of view modal realism is less attractive than
alternative theories that identify merely possible worlds with abstract objects. Therefore,
advocates of modal realism have been accused of multiplying entities beyond necessity.8

In order to address this charge, Lewis argues that there are two different readings of
OR:

1. (OR’) The number of entities of the same type should not be multiplied beyond
   necessity.
2. (OR”) Types of entities should not be multiplied beyond necessity.

The first reading might be called the “quantitative mode” of OR, and the second the
“qualitative mode.” Lewis argues that his theory merely requires belief in the existence of
more objects of the same kind: that is, spatiotemporal objects. In this sense modal realism
does not oblige us to believe in the existence of any new kind of object; after all, nonactual
worlds are of the same kind as the actual world. Moreover, compared with abstractionism,
Lewis’s view might be considered simpler. This is due to the fact that it does not commit to
abstract objects, only to concrete ones. Because of this, modal realism satisfies OR”.

Naturally, it does not satisfy OR’; nevertheless, this should not be a problem, because,
as Lewis claimed, “there is no presumption whatever in favour of quantitative parsimony”
(1973, 87). Accordingly, the theory states only that there are more objects (tokens) of the
same type. In this sense the main claim of modal realism should not be considered to be any
more controversial than the claim that there could be more trees, or more republicans. As
Lewis claimed, (Q): “You believe in the actual world already. I ask you to believe in more
things of that kind, not in things of some new kind” (1973, 87).

3. Between Quantitative and Qualitative Parsimony
Although the observation showing that OR can be interpreted in two different ways seems to be legitimate, it may not be sufficient for defending modal realism against the charge of bloated ontology. There are at least two reasons (related to each other) for this. The first was revealed by Christopher Daly (2010), who considered applying Lewis’s argument to the debate between physicalism and dualism in the philosophy of mind. One of the physicalists’ arguments against dualism is that it violates OR because it postulates two types of substances—physical and mental. Based on the distinction between qualitative and quantitative parsimony, an advocate of dualism may argue that her theory does not require any new type of object, only more objects of the same type, namely, substances. A dualist might paraphrase the Lewisian claim as, (Q*): “You believe in the substance already. I ask you to believe in more things of that kind, not in things of a new kind.”

Alternatively, consider a hypothetical debate between metaphysical essentialist and (fictitious) metaphysical essentialist*. The former believes that each object has an individual essence, while the latter believes that each object has exactly two individual essences. It seems that a quite common reaction to essentialism* would be to indicate that this is a view that multiplies entities over necessity. However—relying on Lewis’s argument—an advocate of essentialism* might argue that he merely believes in more things of the same kind: that is, in two individual essences for each object.

To generalize the above, one can easily apply Lewis’s argument to different kinds of ontological disagreements by simply pointing out that the disputed entities (B) belong to the same category as the undisputed entities (A)—that is, a category “being either A or B.” Accordingly, there is a single category of “being either a spatiotemporal actual or a spatiotemporal nonactual world,” and there is also a single category for “being either a physical or a mental substance” (Daly 2010, 144). If believing in the real existence of possible worlds does not require postulating entities of a new kind, then dualism and essentialism* (compared with physicalism and essentialism) do not require it either.

By modus tollens, however, since there is a significant qualitative difference in the ontological commitments of physicalism and dualism (or essentialism and essentialism*), there should be a similar difference between the belief in the existence of the concrete world and the thesis of a plenitude of such worlds. Accordingly, the ontological commitments of the latter do not have to be as innocent as Lewis claims (Daly 2010, 144–45).

If the above reasoning is plausible, it requires an explanation of why there is an important qualitative difference between the ontological parsimony of physicalism and that of
dualism (*resp.* abstractionism and modal realism, or essentialism and essentialism*). In other words, we should explain why the abovementioned paraphrase of Q given by dualists or essentialist* is inadequate. In order to give such an explanation, we should refer to the difference between two types of objects. This is the subject of the following section.

4. Multipliable and Nonmultipliable Objects

The second way of undermining Lewis’s reply is based on the observation that his distinction is helpful only if we assume that a change in the quantity of the ontological commitment does not entail a change in its quality. Accordingly, it applies only to those objects whose number is not fixed. If, however, the number of the objects of a given type is fixed, a change in the quantity of ontological commitments may result in a change in the quality of ontological commitments as well.

For heuristics reasons, let us put aside the debate over the metaphysics of possible worlds, and restrict our quantification to what exists in the actual world. This will allow us to point to examples of objects for which it is not the case that they are required to exist as an exact number of tokens. Examples of such objects might be trees, planets, mountains, football teams, politicians, women, and so on. From an ontological point of view, there would be no great difference if more trees were to grow than are actually growing. After all, even though it is not easy to estimate how many trees actually grow, this does not forbid us to say that trees exist. Similarly, from the ontological point of view there would be no such great change if there were more planets, football teams, politicians, women, and so forth than we believe there actually are. These changes will result only in a quantitative and not in a qualitative difference in what exists. Since from the ontological point of view the exact number of these objects is not fixed, we can label them “multipliable objects.”

The existence of this kind of object might be easily expressed by a simple quantification (a) $\exists xFx$. If we assume that $F$ stands for a “woman,” then (a) is true, since Hillary Clinton, Queen Elizabeth II, and any other woman satisfies it. In other words, since there is at least one object that satisfies the above formula, (a) truly describes the world. This means that (a) will remain true as long as there is at least one woman. To be precise, we can express this by using a numerical quantifier (b) $\exists^1xFx$; that is, there is at least one $x$, such that $x$ is $F$ (where $F$ stands for “woman”).

In opposition to the above, there are also objects for which it is crucial that they occur in a precise number. Examples of these are God (especially in monotheistic religions), the
winning team of the World Cup 2014, the highest mountain in the world, the biological mother of Napoleon Bonaparte, and the like. For each of these, it is required that there be only one of a given kind of object. Otherwise, each of these objects would lack an important feature that makes them what they actually are: that is, their uniqueness. Accordingly, just because someone already believes in the existence of God, this does not mean that she can easily accept the existence of more than only one God. Quite the opposite; many concepts of God require that there be only one such object. The same is true in the cases of the winning team of the World Cup 2014, the highest mountain in the world, and the biological mother of Napoleon Bonaparte. Each of these objects is such that in the actual world there can be only one token of each.

In this sense, the existence of more than a single token of the abovementioned objects would change not only the quantity of the ontological commitment but also its quality. This is due to the fact that believing in the existence of more than one token of these objects implies an important change in the notions that we associate with them. Although there is nothing in the concept “woman” that forces us to admit that there is a specific, fixed number of them, there can be only one woman who is Napoleon’s biological mother. After all, to be a biological mother of someone means being the only one that gave a birth to this person. Because of this, to believe that there is more than only one object that is a biological mother of a given person requires either believing in a new type of object—the biological mother of X such that is not the only person that gave birth to X or changing the concept “biological mother.” This becomes clearer when, while quantifying actual objects, we substitute the names and descriptions of the mentioned objects for “the actual world” in Lewis’s previously mentioned quotation Q:

\[(Q^{**}): \text{You believe in God/the winner team of World Cup 2014/Napoleon’s biological mother/the highest mountain in the World already. I ask you to believe in more things of that kind, not in things of some new kind.}\]

In these cases it is much more difficult to agree with the claim that a quantitative change does not affect the quality of ontological commitments. For this reason we shall label objects that belong to the second category “nonmultipliable.”

The existence of nonmultipliable objects might be also expressed by (a) and (b). If one assumes that \(F\) stands for “Napoleon’s biological mother,” then both (a) and (b) will be
satisfied. So $\exists x Fx$ and $\exists^{\geq 1} x Fx$ will truly describe our world. This would not, however, do justice to the fact that, in the case under consideration, (a) and (b) can be satisfied by one and only one object. This may suggest that believing in the existence of two biological mothers of Napoleon would have no impact on what being a biological mother is considered to be. In order to be precise and to avoid such a situation, in this case one may change (b) into (c) $\exists^{\leq 1} x Fx$; that is, there is exactly one $x$, such that $x$ is $F$. This will allow us to claim that an object that is Napoleon’s biological mother exists, and at same time it will guarantee that there is one and only one such object. If there were more of them, then (a) and (b) would remain true, but (c) would be false. Considering our understanding of the notion of biological mother, this shows that (c) is a more accurate expression of an existential claim about the biological mother of Napoleon.

Although we have considered objects that are *unique*, not every nonmultiplicable object has to be such. If one takes $F$ to stand for “geomagnetic pole,” then (a) and (b) would remain true. Now consider a theory according to which there are seven geomagnetic poles or a theory that postulates only one such object. Obviously, in such cases, (a) and (b) will remain true; nevertheless, the claim will imply an important change not only in a quantity of what exists but also in its quality. After all, there is an important difference between believing that there are geometric poles and believing that there are exactly seven or two of them. In this case (a) and (b) will not do justice to our belief about the number of objects that satisfy $F$. Contrary to the previous case, (c) does not describe this situation adequately. Although we would like to claim that there is an exact number of objects that satisfy $F$, we do not want to claim that there is only one such object. Analogically we can express this by $\exists^{\leq 2} x Fx$; that is, there are exactly two $x$’s, such that $x$ is $F$. In this sense neither $\exists^{\leq 1} x Fx$ nor $\exists^{\leq 3} x Fx$ truly describes the world.

While (c) seems to be a more precise expression of the existence of unique objects, it is necessary to indicate an important difference between objects that satisfy it. Consider a case where $F$ stands for “dodo”—a flightless bird that became extinct in the sixteenth century. At a certain point it was the case that (c) truly described the reality. There was exactly one token (the last one) of dodo. If, however, there were more dodos, the claim “The dodo exists” would remain true. This is due to the fact that in the dodo’s case, if (a) is true, (c) is *contingently* true. In other words, even though it was the case that there existed only one dodo, there could be more of them. Contrary to the above, if $F$ stands for “Napoleon’s biological mother” and if it is the case that (a), then it is *necessary* that (c).
This may suggest that the proper way to express the existence of nonmultipliable objects is by (d) $\Box \exists^n xFx$, whereas what $n$ stands for will differ for various kinds of objects: for “biological mother” $n = 1$, “geomagnetic poles” $n = 2$, and so on. Nevertheless, (d) cannot be a proper general characterization for nonmultipliable objects either. This is due to the fact that acceptance of (d), with $F$ standing for Napoleon’s biological mother, would imply that in every world there is an object that is Napoleon’s biological mother. Since this is merely a contingent object, (d) should not be considered to be a proper general characterization of nonmultipliable objects. Instead of this being the (unique) nonmultipliable object, it might be expressed by a definite description of the following form (NM$^1$):

$$\Box (\exists x Fx \rightarrow (\forall y Fy \rightarrow (x = y))) \uparrow.$$

The unique nonmultipliable object $x$, which is $F$, is such an object that it is necessary that if $x$ exists, then every object $F$ is identical with $x$. In virtue of the above, we believe that an object is multipliable if it satisfies merely $\exists^m xFx$ (M) (there is at least $n$ number of $x$, such that $x$ is $F$). The relation between multipliable and nonmultipliable objects is such that an object may satisfy M (for example, when $F$ stands for “women”) and not NM$^n$. At the same time, it is the case that if an object satisfies NM$^m$, then it satisfies the weaker claim M as well.

The distinction between multipliable and nonmultipliable objects allows for highlighting the important difference between the ontological commitments of physicalism and dualism. Although advocates of both believe in (a) (where $F$ stands for “substance”), it is obviously not the case that both believe in (c) for the same $n$. While a physicalist, based on his notion of substance, believes in only one type of substance and accuses dualists of multiplying objects over necessity, dualists believe in two types of substances and maintain that the physicalists’ theory is too modest, and in this manner is insufficient when it comes to explaining the metaphysics of mind. In this case a change in the number of substances implies a difference not only in the quantity of ontological commitments but also in their quality. This is also the case for our hypothetical debate between essentialism and essentialism*, where the advocate of the first one might want to claim that the notion of essence is such that every object has exactly one. In this sense, believing in more substances or essences entails either believing in new types of objects or requires an important change in the basic notion of the mentioned entities. Both consequences are far from being ontologically innocent changes in the mere number of postulated objects.
5. Back to Modal Realism

In order to consider whether Lewis’s distinction successfully addresses the charge of violating Occam’s Razor, we should decide whether a spatiotemporal world is a multipliable or a nonmultipliable object. If it belongs to the first group, then believing in a plenitude of real worlds would not affect the quality of the ontological commitment any more than believing in a plenitude of trees or planets does. But if the world were a nonmultipliable object, then the main claim of modal realism would imply not only a quantitative but also a qualitative change in the ontological commitment.

If one believes—as the modal realist does—that every world is a maximal spatiotemporal object, and that the adjective “actual” in the phrase “actual world” is merely an indexical term, then we can easily admit that the world is a multipliable object. This would allow us to believe that nonactual worlds are spatiotemporal objects that exist in the same way our world does. In this sense, a change in the quantity would not result in a change in the quality of ontological commitments. Obviously, critics of this view would argue that only actual objects exist and that there are no nonactual spatiotemporal objects. If one leans toward the latter, then one should exclude the existence of nonactual spatiotemporal worlds. After all, this would require us to believe that more objects exist than everything that exists (or that there exist objects that do not exist). This would also change our understanding of the key ontological notions, such as “object,” “everything,” and “to exist.” In such a case we should consider “world” to be a single, nonmultipliable object.

Although the above observations give quite obvious descriptions of two different approaches toward the notion of the actual world, they allow us to point to an important aspect of Lewis’s defense. It shows that advocates of modal realism need to take the term “world” in the first meaning: that is, as the name for an object for which there is nothing that requires it to be unique. Accordingly, a world would be a multipliable object. Only, in this case the distinction between a qualitative and quantitative difference does make sense in response to critiques of modal realism.

The claim that the world (taken to be a maximal spatiotemporal object) is a multipliable object does not conflict with the axioms of modal realism. On the contrary, it is one of the basic assumptions of this view. This shows, however, that Lewis’s argument against violating OR needs to be supported by a premise according to which there is nothing in our world that makes it a metaphysically unique object. Without this assumption, an advocate of modal
realism might be accused of believing in the existence of a plenitude of objects, such that there can be only one. In this case, what seemed believing in more objects of the same type is actually believing in a new type of object: that is, nonactual spatiotemporal objects.

The main problem is that the above assumption is itself the subject of a debate between modal realists and critics of this theory. As a consequence, Lewis’s reply to the charge of an inflated ontology of modal realism might be considered persuasive only if one already accepts the previously mentioned premise, which is one of the basic motivations for believing in the existence of a plenitude of (spatiotemporal) worlds. So the way in which Lewis addresses the charge of violating OR requires one to believe in the modal realism in the first place—that is, one has to believe in the view that the existence of nonactual objects does not affect the quality of the ontological commitment. Because of this, to make Lewis’s famous quote more precise one should paraphrase it as: “You believe in the actual world already. You also believe that the actual world is a multipliable object. I ask you to believe in more things of that kind, not in things of some new kind.” This shows that the mere belief in the actual world does not guarantee that the belief in the plurality of those objects is as ontologically innocent as Lewis claimed. In order to make it so, one has to assume that the actual world is a multipliable object.

The abovementioned examples of the nonmultipliable objects might suggest that if the actual world is a nonmultipliable object, then it is inconsistent to believe in more tokens of it without changing the concept of the actual world, just as it would be inconsistent to believe in four sides of a triangle, in more than two geomagnetic poles, or in more than only one object that is the biological mother of Napoleon. This may seem to be a change in the burden of the problem from bloated ontology of modal realism into inconsistency of this view.

This, however, would be more than what I want to argue for. As I have mentioned, from the point of view of modal realism there is nothing inconsistent in the claim that there is more than only one spatiotemporal world. Nevertheless, Lewis’s argument was not supposed to convince those who already believe in the modal realism but rather to convince those who are skeptical about its plausibility. Among the skeptics one may find abstractionists who believe that every concrete object is actual: “We abstractionist are Quineans (about existence). In this sense of ‘actual,’ we say that there are not and could not possibly be, nonactual horses. Like ‘round square,’ ‘nonactual horse’ is contradiction in terms” (van Inwagen 2001, 213). It is safe to assume that abstractionists might say the same about the notion of “nonactual spatiotemporal worlds.” Although their motivation for this might be different from the
concrete world being the unique object, my distinction—and assumption that the spatiotemporal world is a nonmultipliable object—fits well with the abstractionist claim that nonactual spatiotemporal object (and consequently the thesis of the plenitude of spatiotemporal worlds) is a contradiction in terms.

There is, however, another type of skepticism that does not have to be grounded in the abstractionist’s assumptions about the meaning of “actual,” and does not have to result in the charge of contradiction in the thesis of the plenitude of concrete worlds per se. Passing over the abstractionists’ assumptions, the problem of whether believing in the plenitude of spatiotemporal worlds is inconsistent is an open question. This is due to the fact that intuition about multipliability of the concrete world may be less clear than in the quite obvious cases of trees and Napoleon’s biological mother. If, however, the distinction between multipliable and nonmultipliable objects is plausible, acceptance of modal realism requires believing that the concrete world belongs to the first group. Without this, modal realism might be accused of multiplying nonmultipliable entities. In this sense, the thesis of the plenitude of concrete worlds may result in the charge of inconsistency. This, however, as I have mentioned, is a step further than what I aimed to argue for. My aim is merely to indicate the silent assumption underneath modal realism, which makes the thesis of the plenitude of concrete worlds not as uncontroversial as Lewis suggested in Q.

5. Conclusions
The importance of the distinction between quantitative and qualitative parsimony can be recognized only if multiplying the given entities merely results in a change of quantity and does not change the quality of the ontological commitments of the theory. As an example of the debate over the metaphysics of mind shows, there are cases in which qualitative and quantitative parsimony are closely connected to each other. A modal realist has to assume that her notion of a world is one that allows a person to believe in more tokens of the same type of object without implying a change in the quality of the ontology. Accordingly, Lewis’s argument may be convincing only to those who already believe in a plenitude of real possible worlds.

An advocate of modal realism might argue that even if a change in the quantity of ontological commitments affects its quality, this does not mean that belief in the existence of a plenitude of spatiotemporal worlds violates Occam’s Razor. After all, as Lewis argues, his theory has many advantages over alternative theories, and so does not need to be considered a
theory that multiplies entities *beyond necessity*. On the contrary, as Lewis claims, postulating
these entities is required in order to give a comprehensive analysis of modality (Lewis 1986,
chap. 3). This way of defending modal realism is based on indicating its explanatory power,
and it is meant to show that alternative theories lack theoretical attractiveness, which one can
find in modal realism. Although this may be a successful line of defense, it is independent of
the distinction between quantitative and qualitative parsimony and should not affect these
investigations.

My aim is merely to show that the distinction between the quantity and quality of
ontological commitments is helpful only if the former does not affect the latter. Accordingly,
just because someone already believes in the existence of an object of a given type, this
should not be taken as a justification for believing in the existence of a plenitude of these
objects. Because of the above, I support the view that in some cases there is a presumption in
favor of quantitative parsimony—namely, in those cases where a given theory multiplies
objects that are considered to be nonmultiplyable.

**References**


(Accessed 12 August 2017.)

*Philosophical Studies* 84:225–38.


Daly, Christopher. 2010. *An Introduction to Philosophical Methods*. Toronto: Broadview
Press.


48, no. 3:329–43.


---

1 For the historical aspects of Occam’s Razor see Thorburn 1918 and Baker 2013.
2 Some philosophers modify Occam’s Razor to Occam’s Laser. According to this modification one should not multiply *fundamental* entities beyond necessity (Schaffer 2015).
3 It should be stressed that just because a given theory is simpler than an alternative theory does not mean that the former theory is better. Simplicity is merely one of a plenitude of factors that we can take into account when evaluating theories. Besides simplicity, one should consider the fruitfulness of a given theory, its coherence, explanatory power, accordance with data, and the like (Smart 1984 and Daly 2010, chap. 4). Although all of these seem to be equally important, I shall focus on Occam’s Razor.
4 For the relations between ontology/ideology and quantitative/qualitative parsimony see Cowling 2013.
5 In this general respect I agree with Daniel Nolan (1997) and Alan Baker (2003). Although they also argue for the importance of quantitative parsimony, they focus on scientific theories. The subject of the present analysis is a metaphysical theory of possible worlds.
6 Naturally, whether something is controversial or not is a relative issue. One person’s hell is another person’s heaven, and what is controversial for one might be common sense for others. Nevertheless, in the case of modal realism even David Lewis was aware of the fact that his metaphysical theory results in the “incredulous stare.”
7 Some modifications of this view have been presented in Yagisawa 1988 and Bricker 1996.
8 Some argue that the modal realist “is committed to rejecting Occam’s razor, even when its application is restricted to the actual world” (Forrest 1982, 457).
9 It should be stressed that it is not claimed that the physicalist believes in a single token of substance. After all, she believes in a plenitude of substances of particular objects. These, however, are all merely tokens of physical substance. Accordingly, even though there is a plenitude of tokens of substances, there is only one type of them: that is, physical substance.
10 Obviously, in the case under consideration both (a) and (b) are interchangeable. However, I refer to the numerical quantifier not for aesthetic but rather for heuristic reasons. As we shall see, it will allow us to indicate the difference between existential claims for various types of objects.
11 For simplicity’s sake, I shall avoid debates over cases of surrogacy.
In the cases where there are two nonmultipliable objects that are $F$ (such as geomagnetic poles) the form would change to \( (\exists \exists y F x \land F y \rightarrow (\forall z F z \rightarrow ((x = z) \lor (y = z)) \land (y \neq x)))) \). The formula might be easily extended according to the number of nonmultipliable objects.

For a debate over plausibility of indexical interpretation of “actual” see van Inwagen 1980 and Lewis 1986, 92–96.