ARTÍCULO DE REFLEXIÓN

Modes of existence

Modos de existencia

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ABSTRACT

In this paper I argue that the so-called existential quantifier should be reinterpreted as the someness quantifier. I also claim that existence is not single but fivefold: real, phenomenal, conceptual, semiotic, and fantastic.

These five concepts are defined and exemplified, and a general concept of existence is evoked. Its very existence invalidates all the arguments against existence proofs, such as Anselm's, that involve the alleged nonexistence of an existence predicate.

Keywords: ontology, philosophy, metaphysics.

RESUMEN

En este trabajo afirmo que el llamado cuantificador existencial debe ser reintrepretado como el cuantificador de cantidad. También sostengo que la existencia no es unívoca, sino quíntuple: real, fenomenal, conceptual, semiótica y fantástica. Estos cinco conceptos están definidos y ejemplificados, y se evoca un concepto general de existencia.

La existencia misma invalida todos los argumentos contra las pruebas de existencia de Anselmo, que implican la supuesta inexistencia de un predicado existente.

Palabras clave: ontología, filosofía, metafísica.

1. INTRODUCTION

In this paper i argue that the so-called existential quantifier should be reinterpreted as the someness quantifier. I also claim that existence is not single but fivefold: real, phenomenal, conceptual, semiotic, and fantastic. These five concepts are defined and exemplified, and a general concept of existence is evoked. Its very existence invalidates all the arguments against existence proofs, such as Anselm's, that involve the alleged nonexistence of an existence predicate.

2. ∃DOES NOT FORMALIZE EXISTENCE

Given the persistent confusions about existence in the literature, from Parmenides to Martin Heidegger to the gravitational waves hunters, it won't harm to repeat again and again Hamlet's most famous saying.

The most egregious of the said confusions is the popular dogma that the so-called existential quantifier ∃ exactifies the notion of existence in all fields. That this is a plain mistake, is realized upon recalling the way ∃ is defined, namely, as not-all-not, or ∃xPx = ¬∀ x¬Px.

Indeed, this formula should be read, "Some individuals have the property *P*," as in "Not everyone is uncommitted." In sum, ∃ = *some*, not *there is.*

In other words, with all due reverence for Charles Sanders Peirce, Bertrand Russell, Van Quine, and Alfred Tarski, ∃ should be rechristened the "someness quantifier." The immediate reward for admitting this correction is that it eliminates the question of the ontological commitment of logic. Logic has no such commitment, for it is *de dicto*, not *de re.* As Leibniz wrote, its truths (the tautologies) are *vérités de raison*, not *vérités de fait*. This topic-indifference is why logic can be used everywhere but cannot replace science. That is also why Hegel's notion of a dialectical logic is nonsensical. Admittedly, conflict or competition is as ubiquitous as cooperation, but contradiction proper is about propositions, not things.

3. REAL EXISTENCE

Let us now tackle real existence, the concept occurring, for instance, in the recent doubts about the claim that the Higgs boson was discovered at CERN in 2012.

We shall distinguish the definitions of this concept from the criteria for finding out whether or not something exists really, or is in the world. Whereas a definition of a concept answers the "What is it?" question, a real existence criterion answers the "How do we know?" question. Whereas the latter is epistemological, the former is ontological.

In line with my materialist or reist (thingist) ontology, I propose

DEFINITION 1. Real existence = materiality = mutability.

More formally, For all *x*: *x* exists really = *x* is mutable. If preferred, ∀ *x* (*x* is an existent = *x* is capable of changing).

Note that, following Alessandro Padoa's advice, to define we use identity (=), not the much weaker equivalence relation (if and only if). Thus, "For all *x, x* is alive if and only if *x* metabolizes," but there is much more to life than metabolism (that is, life ≠ metabolism). Note also that this type of existence is absolute or context-free. In particular, it does not depend on human experience.

Since in principle every existent x can be ascribed at least one state space $S_r(x)$, or set of all possible states of existent *x* relative to a reference frame

r, the above definition may be replaced with:

DEFINITION 2. An object x exists really = every state space $S_r(x)$ for *x* has at least two elements.

For example, if *a* and *b* name two different possible states of *x*, such as

a = *x* is at place *p* relative to frame *r* at some time t_1, and *b* = *x* is at place *q* at time t_2, where $p \neq q$,

then *x* may be involved in two different events during $[t_1, t_2]$:
<*p, r, t1*> → <*q, r, t2* >, and <*q, r, t1*> → <*p, r, t2* >

Consequently, x exists really during the time interval [t1, t2] = x is an existent over $[t_1, t_2]$:
Finally, we stipulate the following real existence criterion or indicator:

CRITERION 1. An individual *x* exists really if and only if x makes a difference to at least one other existent.
More precisely, for all *x*: x exists really relative to frame r and at time *t* if and only if $\exists y\{(y \neq x) \ \& \ [S_r(y) \neq S_r(x)]\}$, where $S_r(x)$, $S_r(y) \neq \emptyset$.
Equivalently, x exists really relative to frame r and at time t if and only if *x* acts upon *y* or conversely. In symbols, $A_{r,t}(x,y) = [S_r(y) \ \Delta \ S_r(x)]$, where Δ stands for the difference between two sets. That is, AΔB = (A–B) U (B–A) = everything in A but not in B plus everything in B but not in A.
Finally, note that real existence is absolute. In particular, it does not depend on experience: the above definitions and criteria are not egocentric. By contrast, subject-dependent existence can be characterized by

DEFINITION 3. An object x exists phenomenally = x occurs in someone's sensory experience.

More precisely: For all *x*: x exists phenomenally if there is at least one sentient being that feels *x*.
Note, firstly, that, unlike real existence, phenomenal existence is relative to some subject—whence it may also be called subjective. Secondly, the subject in question is any organism capable of sensing external stimuli. Thus even the lovely *Mimosa Pudica* weed, whose leaves fold when touched, can be said to detect phenomenal existents. This well-known fact raises the question whether phenomenalist philosophers, like Hume, Kant, Mach, and Carnap, should be lumped together with sensitive plants.

4. CONCEPTUAL EXISTENCE

Conceptual existence is occurrence in a conceptual system, that is, a collection of constructs held together by a binding relation such as concatenation, implication, addition, function, or morphism.

In short, we propose

DEFINITION 4. $S = <C, •>$ is a conceptual system = C designates a set of constructs, and $•$ is a binary relation in C.

Obvious examples of conceptual systems are propositions, graphs, groups, categories, classifications, and theories (=hypothetic-deductive systems). By contrast, sentences are not systems unless their key terms are interpreted, or assigned meanings, and thus converted into the linguistic counterparts of propositions.

We are now ready for

DEFINITION 5. For all x, x exists conceptually = x is a constituent of a conceptual system.

For example, $p \lor \neg p$ exists in the system $<L, \lor, \land, \neg>$ of classical tautologies, but not in that of intuitionist logical truths. And the number $\sqrt{2}$ exists in the system $<R, +, . , ^{-1}, < >$ of real numbers, but not in the algebra of classes or in Peano's system of integers.

The mathematical existence (and nonexistence) theorems constitute the purest specimens of conceptual existence. Let us briefly recall three of them: the irrationality of $\sqrt{2}$, the intermediate value theorem in the calculus, and the axiom of choice in set theory.

The earliest existence (or rather nonexistence) theorem was perhaps the statement that there are no two positive integers m, n such that their ratio m/n equals $\sqrt{2}$. An equivalent statement is that no positive integers m, n satisfy the equation "$\sqrt{2} = m/n$." Shorter: "$\sqrt{2}$ is an irrational number".

Likewise, Fermat's last theorem states that no three positive integers $a, b,$ and c satisfy the equation $a^n + b^n = c^n$ for any integer value of n greater than 2. In both cases, the existence of an object has been replaced with its satisfaction of some formula. This kind of existence is thus relative, by contrast with the existence of, say, the sun, which is absolute in that it does not depend on anything else.

No such substitution is possible in the factual sciences and technologies, where (real) existence (or nonexistence) is absolute. For example, asserting that perpetual motion machines are impossible is not quite the same as saying that a perpetual motion machine would violate (or fail to satisfy) the first law of thermodynamics. Indeed, whereas the first statement has only one referent, the second has two, and, moreover, it is a counterfactual. And counterfactuals,

the darlings of possible-worlds philosophers, are not admitted in scientific or technological discourses except as heuristic devices.

Besides, a radical skeptic, like a Popperian, would argue that the first law is just a hypothesis, so we should not disqualify a priori any research on perpetual motion devices. Fortunately, neither physicists nor engineers since the mid-nineteenth century have wasted their time attempting to refute the said law.

Neither the existence concept nor its dual is replaceable in the majority of mathematical existence theorems. Think, for example, of the intermediate value theorem, which asserts the existence of a point ξ, in the [a,b] interval of the horizontal axis, where a continuous function f, such that f(a) > 0, and f(b) < 0, vanishes, that is, f(ξ) = 0.

But for the existence of this theorem, a material point could not move smoothly from the first quadrant to the fourth. The radical constructivists (or intuitionists) refuse to accept this theorem because it does not tell us how to construct the functions that satisfy it. Let them pay for the loss of that wonderful theorem.

However, the most hotly contested existence statement in the whole history of mathematics is the axiom of choice, usually attributed to Ernst Zermelo, but actually anticipated by Giuseppe Peano and Beppo Levi. Roughly, this axiom states that, given a possibly infinite family of nonempty disjoint sets, there is a function, called the *choice function*, that picks one element of each set. The domain of this function may be pictured as the collection of electoral districts of a country, and its codomain as the parliament of their representatives.

Constructivists object that this axiom does not specify how to construct the choice set. All the others accept the axiom. The Platonists because it has been proved that set theory is consistent with or without it. And the rest accept the axiom because it "works", in the sense that it is used to prove theorems in many branches of mathematics.

The axiom of choice is firmly entrenched in the body of mathematics. Indeed, it is equivalent to several other key mathematical statements that at first sight are alien to it. One of them is Zorn's lemma, which reads thus: "if X is a non-empty partially ordered set such that every chain in X has an upper bound, then X contains a maximal element"[2]. For example, if A = {a,b,c} $\subseteq$ X, and $a < b < c$, then there is a u in X such that, for every x in X, if u ≤ x, then u = x.

From the fictionist viewpoint, the debate over constructivity is a storm in a teapot. Indeed, whether or not there is a constructive proof of a given mathematical object, this is just as fictitious as Zeus or as a talking dog. Unlike abstraction, fictiveness does not come in degrees any more than real existence does. Only those who, like the nominalists, fail to distinguish conceptual from material existence, can get excited over the debate in question.

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2 Paul R. Halmos, Naïve Set Theory (Princeton, N.J.: Van Nostrand, 1060.

5. SEMIOTIC EXISTENCE

Driving down a road I see a stop sign, and I immediately press the brake pedal. Should we attribute existence and a causal power to the stop sign? Undoubtedly, since I reacted to my perception of it. The sign in question has what may be called "semiotic existence", or "existence by proxy".

Of course, the road sign does nothing by itself, but my reading and understanding it has a causal power, hence it must be attributed real existence, which it lacks to someone who has no inkling of the language it is written in. The causal chain is: Light beam reflected by the road sign → my cognitive system → my voluntary action system in my prefrontal cortex → my right leg-and-foot system → brake pedal → my car's braking system → my car's slowing down.

The preceding suggests the following

DEFINITION 6. The object *x* exists semiotically = some animal *y* is capable of producing reaction *z* upon perceiving and evaluating *x*.

A second type of semiotic existence is what may be called "denotational reality", as in "Contrary to conventionalism, the field equations are not just computational tools but represent physical entities." This suggests.

DEFINITION 7. The symbol *S* is realistic (or exists semiotically) = there is a real existent denoted by S.

This concept occurs implicitly in the discussions, still going on, about three important physical symbols: the electrodynamic potentials, the metric tensor in the theory of gravitation, and the state function in quantum mechanics. It can be argued that all three are endowed with physical meanings: the first two denote fields (the electromagnetic and gravitational ones respectively), and the third denotes quantum-theoretical entities such as electrons.

6. FANTASTIC EXISTENCE

Fantasies can be said to exist in their own contexts. More precisely, we propose

DEFINITION 8. For all *x: x* exists fantastically = there is a work of fiction that contains or suggests *x*.

For example, Shakespeare's Caliban exists, or "makes sense," in his play *The Tempest*, but nowhere else. The same holds for the myriad Hindu divinities: their worshippers reify them by flinging lumps of butter at their images.

Actually all literature proper, unlike honest journalism, weather reporting, and accounting, is fantastic to some extent, which is why we read it: not to learn but to be moved or uplifted, challenged, or entertained.

The same holds for music, the plastic arts, and artistic cinema: all their specimens are fantasies. And fantasy comes in degrees. Thus, Italo Calvino's

nonexistent knight is even more fantastic than his cloven viscount; and abstract mathematics is further removed from reality than number theory.

In both the cases of artistic experience and religious worship we let ourselves be overwhelmed by fiction and detachment from reality. Thus, immersion in either art or religion involves the involuntary denial of reality—a seal of temporary insanity. Thus the latter is not just an invention of criminal lawyers, but the normal condition of genuine religionists and artists. Even televangelists and fake artists have to fantasize.

We fantasize some of the time in all walks of life, sometimes to escape from reality, and others to cope with it. In the famous Italian film "Pane, amore e fantasia", a ragged man lunches on a loaf of bread seasoned only with love and fantasy. By contrast, Gina Lollobrigida, whom that film gave instant celebrity, was abundantly real.

Mathematicians and theoretical physicists are professional fantasizers. But their fantasies, unlike those of Hyeronimus Bosch or Maurits Escher, are bound by reason. In fact, mathematical activity consists most of the time in proving theorems—that is, in forcing certain items into preexisting conceptual systems. And, as David Hilbert remarked a century ago, theoretical physicists have an even harder time than pure mathematicians, for they are expected to justify their inventions in terms of empirical findings. Indeed, when their fantasies turn out to be wild, like those of string theorists and many-worlds fans, they are rightly accused of perpetrating pseudoscience.

According to Plato's Socrates, the unexamined life is not worth living. (Kurt Vonnegut commented: "But what if the examined life turns out to be a clunker as well?") Much the same may be said about life without fantasy, since it takes a lot of fantasy to conceive of new theories and new artifacts, as well as to design new feasible courses of action, and even to estimate their possible moral values.

7. Similarities and relations

We have argued that there are existences of five types, only one of which—real existence—is absolute, that is, context-independent, in particular subject-free. How similar are the various existences, and how are they related to one another? Let us see.

1. Real existence is absolute or unconditional, hence it must be either postulated or proved experimentally. Furthermore, real existence does not come in degrees: For all *x, x* either exists really or not. The concept of partial existence, about which Jacques Maritain wrote, is a theological fiction necessary only to make sense of the assertion that God is the *ens realissimus*—the uppermost link in the Great Chain of Being.
2. Phenomenal existence is relative, for it occurs only in sensory

apparata, whether rudimentary like a worm's or highly developed like ours. Let us not tell a schizophrenic that the monsters he claims to see or feel "are only in his mind," for he perceives them, vividly and often painfully as well, as lurking out there. After all, the organ of phenomena, namely, the nervous system, is objectively real. Thus, phenomena may be said to be once-removed from objectively real processes.

3. Conceptual existence is relative to some conceptual system or other, within which it must be either assumed or proved exclusively with conceptual resources. For example, ∃ is either defined in terms of ∀ and ¬, or introduced via some postulates of the predicate calculus. And mathematics as a whole depends on the existence of original mathematicians, who are of course real entities. Thus, for all x: x exists conceptually = ∃y (y is human & y can think of x). Hence, even the most abstract concepts presuppose the real existence of abstractors.

4. Semiotic existence is attributable only to signs. And these are perceptible objects, hence objectively real as well—though only a perceiver can endow them with signification. Hence after a nuclear holocaust the remains of books would be just physical things rather than semiotic ones.

5. Fantastic existence occurs only in works of fiction while being read by people capable of fantasizing. Hence fantastic existence escapes literal minds.

6. The general concept of contextual existence can be introduced by the following convention:

DEFINITION 9. Let *U* designate a well-defined universe of discourse or collection of objects, and call χ_U the characteristic function of *U*, defined by this pair of value assignments: $\chi_U(x) = 1$ if and only if *x* is in *U*, and $\chi_U(x) = 0$ if and only if otherwise.

The existence predicate is the function E_U from *U* to the set of existential propositions, such that $E_U(x) = [\chi U(x) = 1]$. If U is a collection of real items, then the existence in question is real; it is semiotic if U is an assemblage of signs; and so on.

The above definition suggests the invalidity of the once-famous assertion that "existence is not a predicate", once used to discredit Anselm's proof of the existence of God. And logicians are not equipped to evaluate existence claims. Claims to existence and its dual are too important to be admitted or rejected without an extralogical justification. Because physicists know this, some of them kept designing and performing experiments to detect the elusive gravitational waves predicted by Einstein one century ago, until they found them, just a few months ago[3].

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3 This is a somewhat altered fragment of the author's forthcoming book Doing Science.

Sobre el autor

Mario Bunge es Doctor en Ciencias Físico Matemática por la Universidad Nacional de La Plata, Argentina. Creó la Universidad Obrero Argentina y una de las primeras revistas de filosofía de la ciencia racionalista de la región, Minerva. Recibió el Premio Príncipe de Asturias de Humanidades en 1982. Jubiliado de la Universidad McGill de Canadá,su obra más destacada es "Tratado de Filosofía Básica". Tiene además decenas de libros publicados en distintos idiomas.
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