# What is a Predicate?

## Three Levels of Entity

The question of what is a predicate turns on background assumptions about how language relates to “the world.” Among these are “ontological” assumptions about three levels of entity.

**Ontology.** The World: by the laws of nature individual entities (“substances”) are composed of properties and an individuator (“matter”), and fall into classes (“natural kinds”, species, genera) according to what properties they have. (Studied in ontology and metaphysics.)

**Mental Language.** The Mind: by laws of nature thoughts that are true or false(called “propositions”) are composed of component “concepts” (also called “ideas,” and “metal representations,” according to a special mental grammar (sometimes called mental language or the language of thought). (Studied in psycholinguistics, neuroscience, and the philosophy of mind.)

**Natural (Spoken) Language.** Speech: By the laws of grammar governing natural languages morphemes form words and words form sentences. (Studied in linguistics.)

## Relations between the Three Levels

**Mind to World.** By a natural process concept in the mind are supposed to stand for substances, properties, and classes in the world, and propositions in the mind are supposed to be true or false according to whether they correspond to the facts about substances, properties, and classes in the world. In the Middle Ages the relation of a concept to what it stands for was called *signification* in its primary sense; in modern philosophy and semantics it is called *representation*. (Studied in semantics.)

**Spoken to Mental Language.** By convention (an arbitrary cultural rules and practices) spoken words correspond to mental concepts and spoken sentences to mental propositions. A spoken word refers via it associated concept to individuals, properties, or sets in the world. A spoken sentence is true if its corresponding proposition is true and corresponds to the world. In the Middle Ages the relation of a spoken word (“sound”) to a mental concept was called signification is a secondary sense. A spoken word signifies a concept, which in turn signifies something in the world. In modern semantics the relation between a spoken word and what its concept represents is called *reference*. (Studied in semantics.)

## What is a Predicate?

**Traditional Logic.** In traditional logic there are four *categorical propositions* in which *S* is a common noun:

Universal Affirmative: *Every S is P*

Universal Negative: *No S is P*

Particular Affirmative: *Some S is P*

Particular Negative: *Some S is not P*

and two *singular propositions* in which S is a proper noun:

Affirmative: *S is P*
Negative: *S is not P*

A predicate was defined as any word or phrase that is grammatically acceptable in the *P* position. It is normally a common noun, adjective, or intransitive verb, and was understood to stand for a property.

**Modern Logic**. In Modern logic predicates are capital letters like *F,g,H,R,S,T* etc. that are understood to stand for sets or relations. Simple (“atomic”) sentences are made up by writing immediately after a predicate singular terms that indicate what the things in the world the predicate is “true of,” i.e. what things in the world fall in the set or relation named by the predicate. These singular terms fall into two kinds: (1) constants ,which are lower case letters *a,b,c,d*,etc. , that function like proper names and stand in a fixed (“constant”) way for individual things or (2) variables, which are lower case letters *x,y,z*, etc., that function like pronouns and stand in an indeterminate way for individual things. Thus *John is red* may be written *Rj* and *Mary Loves it* by *Lmx*. Like traditional logic so-called *one-place predicates* (a predicate followed by just one singular term) are used to represent common nouns, adjectives, intransitive verbs. A *two-place predicates* (a predicate followed by two singular terms) represents a transitive verb. Though a one-place predicate is understood in modern logic to stand for a set because sets are very well understood in mathematics – there is an entire branch of mathematics called set theory. Some philosophers continue to believe in properties however, despite the fact that ontology has shed little theoretical light on what a property is. Believers in properties point out that there is a correspondence between properties and sets: every property determines a set, namely the set of things that have that property, and every set determines a property, namely the property of belonging to that set. For this reason, even in modern logic a one-place predicate can be said to “stand for” a property.

**Modern Grammar.** In modern generative grammar one of the standard rules for generating simple sentence from component parts of speech says that a sentence can be formed from a noun phrase and a verb phrase, or in linguistic notation:

S→NP+VP

In such cases the VP may be a variety of different phrases, e.g. the copula (i.e. the verb *to be*) plus an adjective, the copula plus a noun phrase, or an intransitive verb. Thus, a verb phrase in modern linguistics (the VP) is a generalized form of the notion of predicate as found in traditional and modern logic. Semantically, linguists take their cue from logicians and understand a VP to stand for a set, though those who believe in properties could also understand VP to stand for a property.

## Is Existence a Predicate?

The answer depends on whether predicate is defined in traditional logic, modern logic, or linguistics.

**Traditional Logic.** In traditional logic whether existence is a predicate turns on whether it is legitimate to insert exists in the predicate position of a categorical proposition, as in *some apple exists*. That question in turn depends on whether there is a property called *existence* that for the putative predicate exists to stands for. Certainly, the proposition *some apple exists* seems to be not only grammatical but true. On the other hand, philosophers like Kant argue that there is no property called existence.

**Modern Logic**. In the notation of modern logic existence is expressed by the existential quantifier ∃, and even the universal quantifier ∀ranges over things that exist.

∃*xFx*  means *there is an x and it is F*

∀*xFx*  means *for any x that exists, it is F*

However, even in the notation of modern logic there is an indirect way to say of an individual named by the constant (proper name) *a* that it exists:

∃*x* (*x* =*a*) *(there exists an x that is identical to a)*

Nevertheless there is no standard one-place predicate in standard symbolic logic that translates the verb *exists*. For this reason many say that existence is not a predicate in modern logic.

More recently, however, logical notation called *(existence assumption) free logic* has been developed. In standard logic the argument know as existential generalization is valid

 *a is F* *Fa*

∴*something* *is F* ∴∃*xFx*

In some contexts, for example those in which we reason about the properties of fictional or hypothetical entities, we make reference to objects that do not exist without wanting to sanction, as the logical rule above does, the inference to the existence of these objects. In such contexts existential generalization is invalid. Another quirk of standard logical notation is that the assertion about an individual that it exists that it exists turns out to be a logical truth. That is, the sentence ∃*x* (*x* =*a*), which says that *a exists*, is always true. But this result is highly problematic. It is certainly false of most things in the world (apart from mathematics) that they necessarily exist.

Free logic is designed to avoid these counter-intuitive consequences of standard logic. In free logic quantifiers range over possible objects and a special predicate E is introduced as an existence predicate that stands for the set of things that exist. In free logic

∃*xFx*  means *there is a possible x and it is F*

∀*xFx*  means *for any possible x , it is F*

∃*x* E*x* & *Fx*  means *some possible x exists and it is F*

∀*x* (E*x*→*Fx*) means *for any possible x if x exists, then it is F*

The proposition that something exists is captured by the existence predicate E:

∃xExmeans *some possible object exists*

The new notation, then, has the right consequences. In free logic existential generalization is invalid and the assertion that something exists is not a logical truth.

Thus, there is not simple answer to whether existence is a predicate in modern logic. The answer depends on the context and the logic that is appropriate to use for that context. Both versions of modern logic are agreed, however, on the semantic issue. Both the sentence ∃*x* (*x* =*a*)*,* which says *a exists*  in standard notation and the sentence E*a*, which says *a exists* in free logic, are true if and only if the referent of *a* is a member of the set of things that exists. That is, both agree that there is a set of existing things that stands as the semantic correlate to assertions of existence. The existence of this set will does not settle the issue of whether there is addition to a predicate for existence also a property that the predicate stands for because logic as a general rule eschews the entire notion of property because it is not well defined mathematically.

**Modern Linguistics.** Clearly *exists* is a grammatically acceptable verb phrase in modern grammar, and if that is all that is meant by a predicate, linguistics is clear that existence is a predicate. Like logicians, however, linguists interpret predicates of this sort as standing for sets. Thus though linguists would b committed to the existence of a set of things that exist, they do not as a general rule make use of properties in semantics and are therefore silent on the issue of whether there is also something called the property of existence that corresponds to the “existence predicate.”