

Semantic Truth

The concept of truth was traditionally taken for granted in philosophy, as self-evident, indefinable and basic. When attempts were made to define it, as coherence, or correspondence, or pragmatically, no satisfactory account seemed to emerge, and the concept may even have become more obscure. The development of modern logic highlighted the difficulties (because a precise concept of 'true' seems required when we interpret the syntax of a logic), but also created some new tools with which to tackle the problem. The aim was not to explain the nature of truth, but to give a theory that was 'adequate', showing what may or may not be asserted. The resulting theory is technical in character, but is worth studying, because it has had enormous influence on the way analytic philosophers understand truth.

A 'sentential function' is a formula such as 'x is green', or 'x loves y'. It behaves like a function, because you can input values for the variables ('grass', or 'Jack' and 'Jill'), and the output is a single English sentence. If we are willing to assert that 'grass is green', then we say that 'grass' will 'satisfy' the sentential function 'x is green'. In the original semantic theory this concept of 'satisfaction' is used to build up a definition of truth. If we have a set of predicates { ___ is green, ___ loves ___ }, and a set of objects {grass, Jack, Jill}, the underlines indicate where objects can be inserted to make sentences.

If we then say we are willing to assert 'Jill loves grass', but not that 'grass loves Jack', we are creating a 'model', which is a complete set of sentences which are held to be satisfied, and can thus be asserted. This is normally expressed by saying that a sentence is 'satisfied by all sequences', meaning that each sentential function is satisfied by some sequence of objects (selected from a given domain), turning them from functions into actual sentences; sentences contain no free variables, so no further satisfactions are possible, so a true sentence is satisfied by all the sequences. Notice that the one-place predicate 'p is true' has been explained in terms of a two-place predicate 'a satisfies p'. The complete set of true sentences amounts to a definition of truth for that language, but this is an 'extensional' definition, giving all the instances, and it does not define the nature of truth.

In the first instance this satisfaction by sequences of objects applies to the 'atomic' sentences of the model – in which a single object falls under a single predicate, usually written 'Fa'. Further axioms then say how these sentences can be combined, using 'or', 'and', 'not' and 'if...then' etc, and so truth can be specified for all of the complex sentences in the language. These axioms are said to be 'recursive', and the resulting satisfactions are said to be 'compositional', because they build up from agreed simple components.

This does not give us a theory of truth, but gives us clear examples of how 'true' is to be used. There is a further hurdle which must yet be cleared. If "this sentence is false" is true then it is false, and if it is false then it is true; this is the Liar Paradox, and no rigorous logician can accept a language which contains the word 'true', because absurdity results. Thus when we say that the satisfied sentences in a model are 'true', we must step outside of the language of the model, into a 'meta-language'. This meta-language has to include the 'object language' under discussion, and it is expanded to include classical logic and set theory. We then look down on our model full of greenness and love, and assign truths – that is, we give the model a 'semantics', an interpretation.

A meta-language is used to specify how a language works. Thus we might discuss French in English, or predicate logic in German. The proposal, then, is to remove 'true' from the language of the model, and make it part of the way the model is specified. Where other parts of the specification may give rules of syntax, and definitions of basic terms, truth is handled incredibly simply, by just saying which sentences are true. Thus we might say that 'la neige est blanche' (object language) is true if and only if snow is white (metalanguage). We could imagine such statements being added as an appendix to an English book about the French language. The list would be vast, but the complete list can be called a 'definition' of 'true' for the French language. The complete list of true sentences constitutes a 'model' for the French language. Of course we can also discuss the English language in our English metalanguage, and the slightly confusing "snow is white" is true iff snow is white" is the result.

No one thinks we have explained the essential nature of truth by this procedure, but it is 'materially adequate' for its purposes. The procedure refers to sentences, rather than to propositions or thoughts, and so the language being used has to be specified, and the definition only applies to that language. True-in-French and True-in-English will be different, and so we have introduced a new sort of relativism about truth.

Formal logic studies thought with mathematical rigour, offering explicit assumptions, precise definitions, and unambiguous rules. Hence when analytic philosophers aspire to be 'rigorous' in their thinking, the findings of logicians have great authority. This is especially so with the semantic theory of truth, because it was a huge breakthrough in logic, opening up the field of model theory, and allowing much clearer studies of the relationship between meaning and syntax. Thus many modern philosophers have embraced the treatment of truth in terms of metalanguage, satisfaction and assertability, and abandoned attempts to give the essential nature of truth.

The original theory only applies to precise formal languages, containing objects, predicates and connectives, and governed by classical logic. Natural languages are a messier and vaguer business, and so attempts have been made to extend the theory to other aspects of sentences, such as verbs and adverbs. The resulting theories of truth, described as 'minimal' or 'deflationary', are sometimes so thin as to almost eliminate 'true' from English, but are occasionally given more robust interpretations.

The rigour of the original theory has also inspired subsequent formal accounts of truth, perhaps dropping the metalanguage (which led to an infinite hierarchy of nested definitions), or just employing rules for the use of 'true' (without saying which sentences are true), choosing rules that evade the Liar Paradox. Traditional approaches to truth have not gone away though, because the semantic theory tells us nothing about the nature of truth, so many philosophers prefer to examine 'correspondence' or 'truthmakers', or investigate pragmatic aspect of the problem.