

## **Limitations of a Truth-Based Theory of Semantics**

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**Abstract.** As a fashionable and complex subject, truth-conditional semantics has recently become a fairly controversial issue among linguists and philosophers of both language and logic. With a plethora of theories trying to define what meanings really are, the present paper tackles problems of important implications throughout the whole field of semantics, and indeed implications for the definition of that field. The author argues that a semantic theory that is exclusively based on truth-conditions is insufficient for a comprehensive theory, and he comes to the conclusion that presuppositions must also be incorporated within an adequate theory of semantics.

The ultimate aim of semantic theory is twofold: to relate symbols in any natural language to the objects they describe in the actual world, and to find a notation that is capable of representing meanings; it purports to answer the question of what meanings really are.<sup>(1)</sup> In addition, semantic theory has to provide an account of linguistic phenomena such as entailment, synonymy, contradiction and ambiguity in the language it describes.<sup>(2)</sup> The once fashionable referential theory of meaning has been enormously overshadowed by the more comprehensive truth-conditional theory which has the obvious merit of being able to account for the above mentioned linguistic phenomena more effectively and comprehensively than the referential theory.

Truth-conditional semantics, on the other hand, seems to be superior to the reference theory of meaning in the sense that the former comes closer to realizing the

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(1) S. Peters, *Goals of Linguistic Theory* (Englewood Cliffs, N.J.: Prentice-Hall, 1972), p. 27.

(2) R. Kempson, *Semantic Theory* (Cambridge: Cambridge University Press, 1977), p. 9.

aim of semantic theory: to give an adequate account of entailment, synonymy, contradictoriness, etc. In a semantics that is based on truth-conditions, connectives, (e.g. and, if, then, etc.) which do not refer, can be immediately defined in terms of the meaning of the whole sentence. It follows that the meaning of these connectives will be specified through the conditions for the sentence in which they occur.

The truth-conditional theory interprets meanings in terms of all the sufficient and necessary conditions for the sentence to be true. Wiggins has made explicit reference about the relationship between truth-conditions and meaning (entailments and meaning); in other words, he equates truth-conditions with meaning:<sup>(3)</sup>

If we will simply take the notion of 'true' as clear enough for the purpose — not for all purposes, but for this one — then we can say that, for arbitrary sentence S, to know the meaning of S is to know under what conditions the sentence S would count as true.<sup>(4)</sup>

Davidson, on the other hand, has made a comparable statement regarding the relationship between truth conditions and meaning:<sup>(5)</sup>

I have argued that a characterization of a truth predicate ... provides a clear and testable criterion of an adequate semantics for a natural language. No doubt there are other reasonable demands that may be put on a theory of meaning. But a theory that does no more than define truth for a language comes far closer to constituting a complete theory of meaning than superficial analysis might suggest.

With the above definitions in mind, it is possible to maintain that failure to satisfy sentential truth-conditions accounts for a large portion of deviant sentences (sentences which are labelled analytically true, contradictory, anomalous, etc.), and those which are related by entailment and synonymy. The meaning of S is therefore specified by all the necessary and true conditions for S to be true irrespective of whether or not what it describes exists in the real world. Consider the following example:

1) My brother is a brave man.

The above example (1) entails (2), (3), (4) and (5):

- 2) I have a sibling.
- 3) My sibling is male.

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(3) D. Wiggins, "On Sentence-Sense, Word-Sense and Difference of Word-Sense. Towards a Philosophical Theory of Dictionaries," in Steinberg and Jakobovits, ed., *Semantics* (Cambridge: Cambridge University Press, 1971), 14-34.

(4) Wiggins, p. 17.

(5) D. Davidson, "Truth and Meaning," *Synthese*, 17 (1967), 465.

- 4) My sibling is adult.
- 5) My sibling is brave.

we can join (2-5) in (6):

- (6) I have a male adult and brave sibling.

Since it contains all the elements entailed by (1), (6) represents all the sufficient conditions for (1) to be true. However, should any of the truth-conditions for a particular sentence be false, then the whole sentence will also be false.

Truth conditional semantics defines entailment as one of the necessary conditions for the sentence to be true. Thus (7) entails (8) which is one of its necessary truth-conditions:<sup>(6)</sup>

- 7) John has robbed a bank.
- 8) A bank has been robbed.

It is therefore not possible to ascertain the truth of (7) and deny the truth of (8). To put the same idea differently, we can say that the truth of (8) is necessary but not sufficient condition for the truth of (7), whereas the truth of (7) is sufficient but not necessarily condition for the truth of (8).<sup>(7)</sup> Thus the statement made by (7) 'John has robbed a bank' entails the statement made by (8) 'a bank has been robbed' since if (7) is true, (8) must be exhibiting the sufficiency of the truth of (7) for the truth of (8). Furthermore, (8) must be true if (7) is true (exhibiting the necessity of the truth of (8) for the truth of (7)). The set of defining conditions predicts that if (8) is false, then (7) must also be false. However, if (7) is false, nothing follows, i.e. (8) can either be true or false.<sup>(8)</sup>

In the same way, synonymy — mutual entailment — will be naturally predicted if the meaning of the sentence is a set of truth-conditions: true, if two sentences mean the same, they will have the same set of truth-conditions. Consider the following:

- 9) My uncle is a bachelor.
- 10) My uncle is unmarried.

If we agree that (9) and (10) are synonymous, and I believe they are, then if one is true, the other will necessarily be true. In other words, (9) 'my uncle is a bachelor'

(6) R. Kempson, "Review of Fillmore and Langendoen," *Studies of Linguistic Semantics, Journal of Linguistics*, 9 (1973), 120-40.

(7) E. Lemmon. "Sentences, Statements, and Propositions." in B. Williams and A. Montefiore, eds., *British Analytical Philosophy* (New York: Routledge and Kegan Paul, 1966), 87-107.

(8) R. Kempson, *Presupposition and Delimitation of Semantics* (Cambridge: Cambridge University Press, 1975), p. 51.

entails (10) 'my uncle is unmarried' and vice versa. It follows that the set of the truth conditions which are enough and necessary for one to be true will be identical with the set of conditions for the other. Thus both (9) and (10) will be assigned the following truth-conditions:

11) I have an uncle who is adult, and unmarried.

Note that since the same truth-conditions are applicable to both (9) and (10), then synonymy will be automatically predicted. Incidentally, the question of partial, vs. full synonyms will inevitably arise in this context as this will reflect on the truth-conditions under which the sentence will be true. These conditions can be preserved only under substitution of FULL synonyms of a lexical item but not partial synonyms as can be observed in the following examples:

- 12) John is a man.
- 13) John is a person.
- 14) John is a salesman.
- 15) John is a salesperson.

Although we have replaced 'man' with 'person' in (13) and (15) above, we must admit it is not always possible to do so. Such substitution may sometimes prove to be illegitimate as it may lead to deviance, or at least make a difference, in meaning. For example:

- 16) Mary is loved my many men.
- 17) Mary is loved by many people.
- 18) John behaved like a man.
- 19) John behaved like a person.
- 20) 'The goalkeeper is not a man.
- 21) 'The goalkeeper is not a person.

Careful scrutiny of (16-21) clearly shows that the members of each pair are not identical in meaning. In other words, 'man' and 'person' are not semantically interchangeable items within a given context. The meaning of 'man' appears to imply that of 'person' but the opposite is not true: 'person' does not imply all the meanings of 'man.' However, for our present purposes, suffice it to point out that the above listed data seem to bear out the claim that modification, quantification, and negation can preserve truth-conditions only under substitution of FULL synonyms of a given lexical item, but not of partial synonyms.

By the same token, contradictoriness — sentences that cannot be true under any circumstances — is elegantly accounted for in terms of a truth-conditional semantics as any contradictory sentence will be immediately ruled out by its own set of truth-

conditions. The following (22) illustrates the idea:

22) ?John swam in the middle of the lake but stayed ashore.

The oddity of (22) will be readily explained by the fact that it does not satisfy the truth-conditions which are necessary for it to be true. So if (23) is true, (24) must be false, and if (23) is false, then (24) does not follow from it, i.e. (24) can be either true or false:

23) John swam in the middle of the lake.

24) John stayed ashore.

It is important to point out in this connection that a truth-conditional semantics indeed satisfies the aims of semantic theory by pairing the sentences of a language with their individually necessary and sufficient truth-conditions. This will considerably simplify the study of meaning and lay the foundation for a workable semantic theory. Consider the following examples:

25) Rebecca is a woman.

26) Rebecca is a female.

27) Rebecca is adult.

28) Rebecca is a female adult.

Careful examination of (25-28) reveals that (28) represents all the necessary and sufficient truth-conditions for (25); it is a full paraphrasing of it. However, having defined the meaning of a sentence as all the necessary and sufficient truth conditions of that sentence, it follows that (28) explains the meaning of (25). The above listed data indicate that the incorporation of entailment or truth-conditions within semantic theory facilitates semantic description to a large extent. There is little doubt that a comprehensive semantic theory must capture facts of this type and provide adequate description for them.

Having made the above statement, I should hasten to add that truth-conditional semantics, although it was first hailed as a powerful and promising theory of meaning, falls foul of a number of legitimate criticisms, both theoretical and practical.<sup>(9)</sup> First of all truth-conditional semantics is deceptively simple in the sense that it limits itself to dealing with the term 'necessarily true' without being able to define its meaning. We have to take into account that entailment and truth conditions, as we are going to see later, are both dependent on presuppositions of necessary truth relations. However, a semantics built on truth conditions will have no solid foundation

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(9) D. Wilson, *Presuppositions and Non-Truth Conditional Semantics* (New York: Academic Press, 1977), p. 7.

until these presuppositions are themselves effectively delineated. We have then to define what exactly is meant by 'necessarily true' from the semantic point of view.

Moreover, particularly germane to the issue at hand is the fact that both entailment and truth-conditions are much too wide for semantic purposes. For example, a truth logic will entail (31) from (29) and (30):

- 29) Every human being must die.
- 30) John is a human being.
- 31) John must die.

However, it would certainly be counterintuitive to claim that (33) can be inferred from (32) or that (33) is part of the meaning of (32):

- 32) John is a man.
- 33) John is a president.

The most serious attack on a truth-based theory of semantics can be launched on the grounds that such a theory is capable of handling declarative statements only, and that it fails miserably when it attempts to account for non-declaratives such as questions, imperatives, etc. since these can neither be true nor false. Thus while we can assign a set of truth-conditions to (34) and (36), such a set cannot be assigned to (35) and (37):

- 34) The dolphins danced happily on the water.
- 35) Did the dolphins dance happily on the water?
- 36) The prisoner ran for his life.
- 37) Run for your life.

Unlike the case of the two declaratives (34) and (36), a suitable set of truth conditions is almost impossible to find for the interrogative and imperative sentences (35) and (37) respectively. However, since semantics is one component of grammar that aims to give an accurate account of language — itself an infinite set of sentences — it follows that sentences rather than statements should be considered as the object of its description.

One possible solution to the non-declaratives problem may hinge on the allegation that these can be dealt with as indeed having truth conditions, and thus capable of being true or false. Such argument will be based on the controversial assumption that if the underlying meaning of an imperative sentence like (38) is something like (39), then the sentence, being now declarative, will be true or false:<sup>(10)</sup>

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(10) Kempson. *Presuppositions*, p. 43.

- 38) Go home.
- 39) I request you to go home.

By the same token, we can argue that interrogative sentences can be converted into their declarative counterparts and thus given one of the values 'true' or 'false.' For instance, a question such as (40) is equivalent to (41):

- 40) Have you seen a ghost?
- 41) I request you to tell me if you have seen a ghost.

By changing imperatives to their declarative counterparts, we can still argue for a truth conditional semantics and corroborate its superiority to other types of semantic analysis.

The aforementioned solution is directly related to the performative analysis of questions and imperatives advocated in Katz and Postal<sup>(11)</sup> and Ross.<sup>(12)</sup> However, one obvious objection to the performative analysis of non-declaratives comes from the fact that (39) and (41) themselves have no truth values and are thus incapable of being true or false. In this sense the performative analysis has little help to offer in validating the truth-conditional analysis of (39) and (41). It follows that the performative escape hatch fails to save the truth-conditional theory. Yet, exponents of the performative analysis would insist that performatives themselves have truth values and truth conditions;<sup>(13)</sup> for it is fairly indisputable that sentences such as (42) and (43) indeed have truth-values and, consequently, truth-conditions although (44) and (45) cannot be assigned any:

- 42) I beg you to stop getting on my nerves.
- 43) I wish you would tell me if the lights are off.
- 44) Stop getting on my nerves.
- 45) Are the lights off?

The fact that (44) and (45), which are paraphrases of (42) and (43) respectively, can never be assigned any truth values is a valid reason for throwing away the argument of performatives since it appears to be totally vacuous.

The performative analysis is further impaired by the fact that it confuses meaning with illocutionary force. To start with, since a sentence like (38) above can be

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(11) J. Katz and P. Postal, *An Integrated Theory of Linguistic Descriptions* (Cambridge, Mass.: MIT Press, 1964), p. 52.  
 (12) J. Ross, "On Declarative Sentences," in Jacobs and Rosenbaum, eds. *Readings in English Transformational Grammar* (New York: Xerox College Publishing, 1970), 222-72.  
 (13) D. Lewis, "General Semantics," in Harman and Davidson, eds., *Semantics of Natural Language* (Dordrecht, Holland: Reidel, 1972).

analyzed as any of the illocutionary verbs: request, order, advise, etc., then our analysis is in this sense ambiguous. There is little doubt, however, that the native speaker will agree that (38) is not ambiguous, while being in doubt as to the exact force it was intended to carry: hence the conclusion that we must differentiate between illocutionary force and meaning and that interrogatives and imperatives cannot be treated in terms of a truth-conditional semantics.

On the other hand, non-declaratives seem best accounted for in terms of something similar to 'entailment' that is common between declarative sentences and their corresponding non-declarative ones. This kind of entailment can be detected at some level of analysis by means of felicity conditions rather than truth conditions in the description of non-declaratives, or by listing compliance conditions for imperatives and possible answer for interrogatives.<sup>(14)</sup> Alternatively, we can place a set of restrictions on the range of possible illocutionary verbs underlying both interrogatives and imperatives. However, the trouble with this solution is that, though it is capable of annulling multiple ambiguity, it will give rise to wrong predictions concerning a speech act performed by the use of a given sentence. If we agree that questions are surface realizations of requests for information, then (46) will be incorrectly predicted as a contradictory sentence:<sup>(15)</sup>

46) Are the lights off - and I am not asking for information.

The above examples do in fact bear out the claim that meaning and illocutionary force are not identical, and consequently, they should be treated differently by semantic theory.

To carry the argument a step further, even if we had a truth-conditional semantics to account for statements (i.e. declaratives) and a non-truth conditional semantics to account for non-declaratives, we are still far from achieving a fully adequate theory of semantics. The connective 'and,' for example, can be assigned the following paradigm in terms of the standard truth table:<sup>(16)</sup>

P and Q		
T	T	T
T	F	F
F	F	T
F	F	F

The table above indicates that the truth values of 'and' read as follows: if both con-

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(14) G. Lakoff, "The Role of Deduction in Grammar," in Fillmore and Langendoen, eds., *Studies in Linguistic Semantics* (New York: Holt, Reinhart and Winston, 1971), 63-72.

(15) Wilson, pp. 25-30.

(16) *Ibid.*, p. 11.



juncts (P or Q) on either side of the connective 'and' satisfy the truth conditions, the whole conjunction is true. By contrast, if either conjunct fails to satisfy the truth conditions, the whole conjunction is false. On the other hand, listing the truth conditions of conjunctions such as 'and' will not exhaust their meanings.<sup>(17)</sup> In this respect, conjunctions considerably resemble interrogatives and imperatives in the sense that truth conditions can tell part of the story but never the whole of it.

So far I have been dealing with truth-conditional semantics as capable of handling statements (declaratives) since these may be assigned truth-values. However, although all declarative sentences appear to have truth-conditions and truth values which are either true or false, many declaratives do not unless they meet certain presuppositions.<sup>(18)</sup> Kempson draws a distinction between presupposition and entailment, and argues that

presupposition differs from entailment in only two ways: the consequence of S1 being false, and the consequence of S2 being false. For S1 to presuppose S2, the truth of S2 must follow from the truth of S1, but if S2 is false then S1 will have no truth value, i.e. will be neither true or false, or it will not constitute a statement at all. It follows from this that if S1 is false, S2 must be true.<sup>(19)</sup>

Thus for two statements to be related by presupposition the truth of S2 must constitute a necessary condition for S1 to be true. Conversely, the truth of S1 must constitute a sufficient condition for S2 to be true. On the other hand, the truth of S2 must also be a necessary condition for S1 to be false, and conversely the falsity of S1 must be a sufficient condition for the truth of S2. In this way we can claim that (47) presupposes (48):

- 47) The school's headmaster is strict.
- 48) The school has a headmaster.

By the same token (49) and (50) presuppose (51):

- 49) My job is very hard to do.
- 50) My job is not very hard to do.
- 51) I have a job.

A thorough examination of (49) and (50) above reveals that unless (51) is true,

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(17) R. Lakoff, "Ifs, Ands, and Buts about Conjunction," in Fillmore and Langendoen, eds., *Studies in Linguistic Semantics* (New York: Holt, Reinhart and Winston, 1971), 22-23.

(18) G. Lakoff, "Linguistics and Natural Logic," in Harman and Davidson, eds., *Semantics of Natural Language* (Dordrecht: Reidel, 1972), 572.

(19) Kempson, *Presuppositions*, p. 48.

neither of the former sentences can be true.<sup>(20)</sup>

The conclusion that can be drawn from the various psychological and pragmatic arguments above is that an adequate semantic theory must register not only the truth-conditions, but also the 'presuppositions' related to these conditions. These are truth-value conditions or truth-or-falsity conditions. Truth-conditional semantics, no matter how refined it may be, stops short of giving a full account of the native speaker's semantic competence. Moreover, such a theory must take into account that the native speaker knows about the meaning of a sentence more than the total sum of its conditions be they true or false. His intuitions tell him about the speech acts which certain sentences may perform; he knows more about appropriateness than what any sum of truth-conditions may imply. Evidently such a theory will not be based solely on truth-conditions but will almost inevitably incorporate the set of presuppositions for each possible sentence of the language.

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(20) E. Keenan, "Two Kinds of Presupposition in Natural Language," in Fillmore and Langendoen, eds., *Studies in Linguistic Semantics* (New York, Reinhart and Winston, 1971), 45-54.

## مشكلات النظرية الدلالية القائمة على شروط الصدق

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ملخص البحث . بعد أن أصبحت دراسة شروط الصدق في مقدمة الدراسات الدلالية التي تهدف بدورها إلى إرساء قواعد نظرية دلالية شاملة، ظهرت في الآونة الأخيرة مشكلات جديدة أمام التحليل الدلالي القائم على مثل هذه الشروط . وفي هذا البحث يحاول المؤلف إلقاء الضوء على بعض المشكلات التي يواجهها علم الدلالة بوجه عام ونظرية شروط الصدق بشكل خاص ، والتي تحد من فعالية نظرية شروط الصدق . ويخلص المؤلف إلى نتيجة مفادها أن النظرية المذكورة لا يمكن أن تكون أساساً لنظرية دلالية شاملة لأنها لا تأخذ في الحسبان «الافتراضات المسبقة» ، ويعرب عن اعتقاده أن أية نظرية دلالية شاملة لابد من أن تشتمل على الافتراضات المسبقة .