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# Evaluating Semantic Theories of Conditionals: Methodological Challenges

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The article identifies a number of methodological problems encountered in testing and evaluating semantic theories of conditional sentences. Based on the background of three important theories, Material Implication Theory, Stalnaker's Theory, and Adams-Edgington's Suppositional Theory, I show what kind of data and criteria these theories have been working with. The fact that the theorists of conditionals disagree about which theory is the most adequate is related, among other things, to the lack of a broader agreement among them about the common theoretical and methodological criteria by which they would judge these theories. And although formally testing theories of conditionals does not differ from other scientific theories (since it relies on the HD-method or IBE), important differences can be discerned at the level of the auxiliary hypotheses and broader theoretical assumptions under-lying the testing. The results of the present analysis show that unless we agree on what we consider to be the crucial evidence and on which theoretical assumptions and values to ground the testing, we cannot be methodologically consistent in saying which of the theories has stood up better in the tests than the competing theories.

**Keywords**: conditionals – counterexamples – evaluation – evidence – HD-method – semantic theories – testing

*The ability to think conditional thoughts is a basic part of our mental equipment. A view of the world would be an idle, ineffectual affair without them.*
Dorothy Edgington: On Conditionals (1995)

## 1. Introduction

Conditionals are involved in many of our cognitive activities. We cannot do without them when we reason or argue; they underlie our forecasting, planning, and decision making, form the basis of scientific predictions, and convey information that is essential to scientific explanations. Finally, the testing and evaluation of scientific theories cannot themselves be carried out and represented without the use of conditional statements. Although conditionals perform these and other functions in our cognition and reasoning, their nature – more precisely, their semantic (or even pragmatic) profile – has been the subject of theoretical controversy since antiquity (Sanford 2003). There is no other kind of sentence connective that has elicited such diverse and conflicting conceptions as the connective "If..., then...". What exactly is the meaning of indicative conditional sentences? Do conditionals have truth-values? And which inferences (in which the conditionals stand out) are logically valid? Several semantic theories of conditionals offer answers to these and related questions. The fact that these theories are mutually inconsistent with respect to providing a semantic profile of a conditional statements leads to the question of how methodologically correct it is to compare and evaluate the various theories of conditionals with one another. The fact that there is no consensus among theorists of conditionals on the appropriate choice of the best theory suggests that there is also *no consensus* among them on the choice of *methodological criteria* by which to test these theories, both on their own and with each other. Such criteria seem to be indispensable for a comprehensive evaluation of these theories.

In this study, I point out *some* important factors that make it possible *to explain* why achieving agreement in the choice of methodological criteria for assessing semantic theories of conditionals is so difficult. I proceed as follows: First, in Section 2, I briefly introduce three prominent theories of conditionals that give an answer to the question of what the meaning of conditional sentences is, or what indicative conditionals express. Although the selection of the theories under consideration can be extended to include several other conceptions, it is sufficient for the purposes of this study if we restrict ourselves to three classical theories when comparing theories of conditionals: 1. the theory of material implication; 2. Stalnaker's theory (based on the possible-worlds semantics); and 3. the suppositional theory (à la Adams 1975; 1998; and Edgington 1995; see also Bennett 2003), which assigns probabilistic semantics to conditionals so as to represent degrees of (un)certainty of (rational) agents. In Section 3, I highlight the different kinds of data, evidence, and criteria by which different theories are judged, both individually and among themselves. The diversity of the criteria, without explicit hierarchization, makes it difficult to compare the theories under consideration with each other. In Section 4, I address several methodological problems of testing and evaluating theories of conditionals. There, I identify two distinct notions of *counterexample* that are associated with different models of hypothesis testing, the HD model and the IBE model, and show how they relate to the testing of the theories of conditionals. Finally, I argue in favor of the thesis that unless we agree on the kinds of underlying theoretical assumptions and goals, and unless we agree on which data and criteria (and by what weight) are crucial for testing and evaluating theories of conditionals, it is not possible to evaluate these theories in a methodologically consistent manner. In the final section, I summarize the main results of the study.

## 2. Semantic Theories of Indicative Conditionals

Semantic theories of indicative conditionals provide an explicit answer to the question of what conditional sentences express (in the indicative mode), what their meaning is, or what the sentences expressing the conditionals denote. In this section, I briefly review three main conceptions: i) the material implication theory; ii) Stalnaker's theory; and iii) a version of the suppositional theory which denies truth-values to conditionals and which postulates that conditionals express degrees of (un)certainty represented by probabilities (for a comprehensive introduction to these theories, see Bennett 2003; and Edgington 2020).[1]

**Material implication theory**. The theory of material implication states that the meaning of a conditional clause of the form "If A, then B," where "A" and "B" represent certain (simple or compound) sentences of a natural language, is identical to the meaning of the material implication $A \supset B$. At the same time, the meaning of the material implication $A \supset B$ is defined in classical logic as a *truth-function*, expressible by Table 1:

[1] In addition to the three conceptions mentioned above, one can mention others, such as C. I. Lewis's conception of strict conditionals, Łukasiewicz's or de Finetti's three-valued semantics, or some version of the inferentialist conception (e.g. Krzyzanowska, Wenmackers and Douven 2013).

| A | B | $A \supset B$ |
|---|---|---|
| **1** | 1 | 1 |
| **1** | 0 | 0 |
| **0** | 1 | 1 |
| **0** | 0 | 1 |

Table 1

Thus, it is a function that assigns the truth value 1 (True) to the pairs of truth values (1,1), (0,1) and (0,0), which represent the truth values of statements A and B, respectively, and the truth value 0 (False) to the pair of values (1,0) in the phrase "If A, then B." Thus, the theory of material implication says that the statement "If A, then B" implies "$A \supset B$," and conversely, "If $A \supset B$" implies "If A, then B."

**Stalnaker's Theory**. Robert Stalnaker in (1968 [2019]) proposed a theory that links the epistemic idea of the so-called Ramsey test (Ramsey 1929) to the truth conditions of conditional statements.[2] To define the truth conditions of conditional sentences, Stalnaker uses Kripke's model theory, which relies on the notion of *a possible world* and the *accessibility relation*.[3] In addition, he also uses the notion of *selection function f*, a function that maps a proposition and a possible world (as its arguments) to a possible world (i.e. to the possible world that is most similar to our actual world). Specifically, the selection function *f* "selects, for each antecedent *A*, a particular possible world in which A is true. The assertion that the conditional makes, then, is that the consequent is true in the selected world" (Stalnaker 1968 [2019], 155). Without going into detail and specifying the additional requirements that Stalnaker places on the selection function, we can express the basic conditions for the truth of conditionals as follows: The meaning of a conditional clause of the form "If A, then B" is identical to the meaning of sentences of the form "A > B" with the following conditions:

A > B is true at a possible world w if B is true at f(A,w), i.e. at w' = f(A,w).
A > B is false at w if B is false at f(A,w).

[2] Ramsey test is expressed in his famous remark: "If two people are arguing 'If p, will q?' and are both in doubt as to p, they are adding p hypothetically to their stock of knowledge, and arguing on that basis about q; ... they are fixing their degrees of belief in q given p" (Ramsey 1929, 247).
[3] Stalnaker adds another element to these, the so-called *absurd world* λ (see Stalnaker 1968 [2019], 155).

The truth conditions of sentences of the form A > B thus express the idea that a conditional of the form "If A, then B" is true if and only if proposition B is true at a possible world w′ in which proposition A is true *and which differs* only minimally in other respects from our actual world.

**Suppositional theory**. This theory has both a negative and a positive part. Its proponents argue in favor of the thesis (negative part) that conditionals have no truth-conditions, and also propose the thesis (positive part) that conditionals express subjects' degrees of belief that can be ruled by (the theory of) probability (see Adams 1975; 1998; Edgington 1993; 1995; 2020, section 3; Bennett 2003, chapters 4 – 7). This theory is motivated by (among other things) the belief that subjects express the degrees of their beliefs when using conditional sentences of the form "If A, B." Specifically, a subject S believes that if A, then B, to the extent that she thinks that the probability of $A \wedge B$ is close to the probability of A. More precisely, let Pr( | X) be the (conditional) probability function that expresses the degrees of belief of a rational subject S on a supposition that X (is true). Then we say that a conditional sentence of the form "If A, then B" expresses the degree of belief Pr of subject S that B, given A – Pr(B|A) – just in case $Pr(B|A) = Pr(A\wedge B) / Pr(A)$, where $Pr(A) > 0$.[4]

Although these brief characterizations of the theories leave aside several of their other elements and features, they are sufficient to document the fact that they are mutually inconsistent. Whereas the material implication theory assumes that conditional statements denote truth-functions, Stalnaker's possible-world semantics rejects this and ties truth-conditions to a selection-function operating on possible worlds. Moreover, Adams's and Edgington's suppositional theory rejects the thesis that conditionals have truth conditions and replaces semantics based on truth- or selection-functions with probabilistic semantics.

### 3. Data, Evidence, and Criteria

How can these theories be tested? What does it mean to have a counterexample or negative evidence in relation to a given theory? And how are we to compare and test competing theories of conditionals against each other? Are there any objective (or objectified) criteria at all by which we can say that one theory is more successful than alternative theories? In this and the following

[4] More precisely, the idea behind the suppositional theory is known as Adams's thesis, which states the following condition for all simple conditionals: Pr(If A, then B) = Pr(B | A). See Adams (1975, 3).

section, I will try to show where the difficulties in finding answers to these questions lie.

When we talk about testing or evaluating a theory, it presupposes that we have some data that can be used as positive or negative evidence. When discussing the positives and negatives of theories of conditionals, which things are considered as a kind of evidence?

What follows does not aspire to be an exhaustive list of the kinds of data, evidence, values, or criteria involved in testing and evaluating theories of conditionals. Nevertheless, it is a summary of those kinds of evidence that emerge as clear elements in discussions of the pros and cons of particular theories. However, there seems to be nothing close to a methodological consensus as to what kind of evidence or criteria have more weight and how to hierarchize those elements.

**General Arguments**

Igor Douven makes this kind of evidence explicit: "There are some general reasons why one might favor truth-conditional semantics of conditionals over non-truth-conditional semantics" (Douven 2016, 43). And a few lines later he makes his claim concrete with an example:

> One such argument starts by noting that, on the known conceptions of propositions, sentences count as expressing propositions only if they have truth conditions. But if conditionals do not express propositions, then it should be puzzling how we can make sense of Boolean embeddings of such sentences ... (Douven 2016, 43).[5]

General arguments can be found not only in favor of a particular semantic theory of conditionals, but also when they aim at rejecting a competing theory. For example, Edgington (1993, 41 ff.) formulates an argument in favor of the thesis that no conditionals express truth-conditions by showing that (i) for any (indicative) conditional to have truth-conditions, it must be truth-functional; and (ii) since no conditional is truth-functional, then conditionals do not have truth-conditions. Similarly, Lewis' (1976) triviality results targeting Adams' thesis according to which probability of an indicative conditional equals conditional probability – Pr(If A, B) = Pr(B | A) – can also be seen as an argument of a general kind. In this context, it is interesting to note that Adams, Edgington, and others

[5] For further arguments in favor of the material implication theory, see, for example, Rieger (2013).

have used this very argument in support of their suppositional theory, specifically its negative thesis that conditionals do not express propositions.

**Specific Arguments**

Specific arguments in the context of testing the theories in question serve at least two functions: a) they motivate the acceptance of a particular theory; or b) they present a case for challenging a particular theory. And some arguments perform these two functions simultaneously.

For example, Edgington (1993, 37) cites W. D. Hart's example of a proof of the existence of God that is a consequence of accepting the theory of material implication and uses it as a reason to reject the theory:

P1 If God does not exist, then it is not the case that if I pray my prayers will be answered (by Him).

P2 I do not pray.

C1 So, if I pray, my prayers will be answered.

C2 Therefore, God exists.

Since the specific example of using the theory of material implication is sufficient to prove the existence of God, which in itself seems absurd, the argument in question serves to reject the theory.

Similarly, Edgington (1993, 39 – 40) gives an example of an argument that demonstrates that the suppositional theory evaluates the probability of the conditional under consideration correctly, in contrast to the material implication theory. Take the sentence, "If this coin is flipped, it will land heads." How confident should we be about this sentence? The suppositional theory says that, as long as we have no specific information about the behavior of the coin, we should be 50% convinced of a given conditional, no matter how likely it is that the coin in question will be flipped. But if the coin is never flipped, the material implication theory compels us to say that the probability of the conditional is 100%. Since this verdict seems absurd, the theory of material implication must be rejected, or so it is argued.

**Robust Inference Rules**

Another kind of evidence that is often used to support a theory is some kind of inferential rule that is a logical consequence of the theory in question and that also seems robust to potential criticism. Well-known candidates for supporting a theory of material implication include the *Modus Ponens* rule and the *Or-to-If* rule. Consider the case of the latter. If one accepts the sentence

"Marta is studying or playing poker" as true, *one should* equally accept as true the sentence "If Marta is not studying, then she is playing poker." In general, it seems that if one accepts a statement of the form "A or B" as true, then one must also accept a statement of the form "If not A, then B" as true. However, the validity of this inference can be explained as a consequence precisely by the theory of material implication, which takes propositional schemes of the form (Or-to-if) to be logically valid:

$$\text{(Or-to-if)}\qquad \frac{A \vee B}{\neg A \supset B}$$

At first glance, it may seem that the question of which inferential rules are robust to criticism and which are not is easily decidable because it does not depend on the acceptance of certain theoretical assumptions. But the opposite is true. Different theorists start from different theoretical assumptions, which in turn show up in different assessments of the robustness of certain rules. In some cases, it may happen that a certain inferential rule that is valid in a classical logical system – for example, the rule of *hypothetical syllogism* – is confronted with a natural language instance of inference that, although it has the same logical form as the rule in question, we refuse to accept as correct.

Let us consider Adams's example (Adams 1975, 16):

If Smith will die before the election, then Jones will win the election.
If Jones will win the election, then Smith will retire after the election.

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If Smith will die before the election, then he will retire after the election.

We see that even if we accept the truth of both premises, accepting the truth of the conclusion of this argument seems absurd. But while some of the theorists who prefer the theory of material implication may deal with the counterexample in question by trying to preserve the theory in question and in some way show that it is not – strictly speaking – a counterexample, or that the theory in question must be accepted even at the cost of such intuitive counterexamples (because of its theoretical virtues), other theorists may take this counterexample as a relevant reason for rejecting the theory of material implication and propose an alternative inferential rule that is "immune" to such counterexamples. For example, Adams (1975, 16 and 21 – 25) proposes to accept in place of the *hypothetical syllogism* rule a *Restricted Hypothetical Syllogism* (*RSH*) rule that satisfies his criterion of *probabilistic validity*, according to which *the uncertainty of a conclusion cannot exceed the sum of the uncertainties of its premises* (Adams 1998, 38 – 39; see also Adams 1975):[6]

*RHS* $A \Rightarrow B$
$(A \wedge B) \Rightarrow C$
$\overline{\phantom{(A \wedge B) \Rightarrow C}}$
$A \Rightarrow C$

While we don't have the space to go into detail, one thing seems clear: The justification of certain inferential rules by a given theory is usually used as a kind of positive evidence in favor of the theory under consideration. But which inferential rules are considered robust is not theoretically independent. And so counterexamples to particular rules are also evaluated differently by different theorists. While some seek to minimize the impact of the counterexample on the theory, others are motivated to come up with an alternative theory in which the original inference rule is not a valid inference scheme.

**Language User Data**

A frequent type of positive or negative evidence in relation to the theories being considered is the evaluation of the truth-, assertability-, plausibility- or acceptability-conditions of a particular conditional by competent language users. Such an evaluation is then compared with a prediction that has been derived from a particular theory to find out whether it is consistent with it.

For example, Douven (2016) cites several empirical studies (see especially Douven – Verbrugge 2013) that have tested several theoretical principles (Adams's thesis, Stalnaker's thesis, Generalized Stalnaker's thesis, and others) on a sample of respondents in light of the assessments of specific examples of conditionals. They compared these evaluations with the predictions that follow from the theory being tested. What is interesting about these and other similar studies is the fact that they often provide data that challenge some general argument in relation to the theory under consideration. For example, Douven – Verbrugge (2013) show that the data they obtained in their experiments constitute evidence against the generally accepted conclusion that Adams's thesis can be accepted (without trivial consequences) only if we assume that conditionals do not express propositions (and thus do not have truth conditions).

[6] Adams defines the uncertainty of a certain statement A, u(A), as follows: u(A) = 1 – Pr(A).

However, it is not clear under what circumstances data of this kind constitute decisive evidence against a theory that is supported by other kinds of evidence (e.g., general or specific arguments, etc.). What are we to prefer? The theoretical arguments or the data obtained from competent language users?

**Theoretical Assumptions and Criteria**

Consistency of a given theory with other (independent) theoretical assumptions or goals adopted by a particular person or group of theorists is also usually considered as evidence. In particular, one can construct an argument that says that since theory T is consistent with assumption or goal C, and we deem that assumption or goal as methodologically important, T is an acceptable/adequate/correct theory. Conversely, we can show that since a given theory is inconsistent with other theoretical assumptions or goals, it is not an adequate theory.

As a simple illustration, one can cite an objection that arises against the suppositional theory of which Adams (1975, 31 – 37) was already aware: namely, the theory in question cannot cope with nested (complex) conditionals of the form "If A, then if B, then C," and in general the theory has difficulty in explaining how conditionals interact with compound statements that contain Boolean operators.

In addition, when comparing multiple theories with each other, we can also compare them by means of so-called theoretical values (or virtues).[7] That is, we often judge theories in science on the basis of the extent to which they exhibit such desirable properties as simplicity, unifying power, explanatory power, etc. In this sense, *ceteris paribus*, a theory T1 may be preferable to a theory T2 precisely when T1 exhibits a given theoretical value to a greater extent than T2. For example, in terms of both methodological and ontological *simplicity*, *ceteris paribus* material implication theory can be considered preferable to Stalnaker theory because the explanatory apparatus of the former postulates fewer theoretical entities than the apparatus of the latter. On the other hand, in terms of explanatory power, *ceteris paribus* the suppositional theory can be considered preferable to the theory of material implication because the former can account for different degrees of agents' beliefs in relation to conditionals, which the latter theory cannot.

[7] A locus classicus of discussing the import of theoretical virtues in methodological considerations is Kuhn (1977). See also McMullin (2014).

## 4. Methodological Challenges

It is a truism that scientific testing is holistic in nature (cf. Duhem 1954 and Quine 1951). If we want to test a hypothesis, we usually test some of its deductive or probabilistic implications (predictions). However, the derivation of testable consequences relies on other auxiliary assumptions. One part of the auxiliary assumptions has its origin in some scientific theory that is not itself subject to testing (for example, in deriving testable implications from Kepler's version of the heliocentric theory, we rely on the physical theory of optics, which underlies the assumption that the data obtained from the telescope are reliable). And some of the assumptions, in turn, are tied to the empirical conditions under which the derived prediction is tested (e.g., whether the instruments we use to observe, measure, record, or analyze the data are reliable and perform standardly under the conditions). If the inferred predictive implications are consistent with our evidence, this is considered to be a case of confirmation of the hypothesis (but not proof of its truth). Conversely, if there is a discrepancy between the evidence and the predictions, this is considered to cast doubt on some element of the complex of the hypothesis being tested and the auxiliary assumptions. This, in brief, is the basic framework of the course of scientific testing. Its abstract structure is expressed by the schemes HD1 and HD2:

$$\text{HD1} \quad \begin{array}{l} (H \wedge A_1 \wedge ... \wedge A_n) \vdash (E_1 \wedge ... \wedge E_m) \\ (E_1 \wedge ... \wedge E_m) \\ \hline\hline H \end{array}$$

$$\text{HD2} \quad \begin{array}{l} (H \wedge A_1 \wedge ... \wedge A_n) \vdash (E_1 \wedge ... \wedge E_m) \\ \neg(E_1 \wedge ... \wedge E_m) \\ \hline \neg(H \wedge A_1 \wedge ... \wedge A_n) \end{array}$$

Is testing theories of conditionals an exception to this? Formally, no. But there seem to be differences here as to the nature of the auxiliary assumptions.

First, the particular theoretical auxiliary assumptions we rely on to derive testable implications of semantic theories of conditionals may not be obvious at all. For example, the modern version of the theory of material implication (following the constitution of modern logic in the work of Frege, Russell, and others) tends to be associated with the notion of language (use) that is free of semantic ambiguity. Such a language is the language of mathematics. The derivation of a certain testable consequence from a theory that identifies the meaning of indicative conditional sentences in natural language with material implication may implicitly rely on the assumption that natural language is devoid of semantic ambiguity (like the language of mathematics), and even if it is not, it needs to be "cleansed" of this ambiguity for the purposes of unambiguous communication. This assumption may not be obvious, however, and even those who argue in favor of the theory of material implication may not realize that they are relying on it for testing. Of course, the suppositional theory, which says that conditionals have no truth-values, relies on other assumptions. To test it, we assume, for example, that language users hold quantitatively graded beliefs about conditional sentences. In contrast, supporters of the material implication theory do not make this assumption.

Second, the auxiliary theoretical assumptions that underlie the various theories of conditionals do not seem to have as settled an epistemic status as the auxiliary theories that underlie testing in natural sciences. Indeed, there does not seem to be a similar consensus, or at least sufficient agreement, on theoretical assumptions about the nature of language, its competent users, etc., as there is for auxiliary assumptions underlying the testing in the physical, chemical, or biological disciplines.

Moreover, a particular test design may also rely on different methodological and philosophical assumptions. For example, while some analytic philosophers consider relying on their or other experts' intuitions to test hypotheses as methodologically adequate, representatives of experimental philosophy question the homogeneity of intuitions and point to their cultural, linguistic, and theoretical contingency. Other theorists, in turn, advocate the use of formal methods (in solving philosophical and thus semantic problems), while others call for the use of different kinds of empirical data obtained from language users. These assumptions have serious consequences to what data is considered relevant for testing and what is not.

**Two Notions of Counterexample**

An important part of testing scientific theories is to consider the situations that constitute potential negative evidence. In this context, two notions of counterexample can be encountered that are used not only in testing and evaluating theories in general, but also in the case of evaluating theories of conditionals.

(1) Evidence E is a counterexample to a theory T1 if and only if it holds that $E \vdash \neg (T1 \wedge A)$ and $(T1 \wedge A) \vdash \neg E$, respectively.

This is a classic example of hypothetico-deductive disconfirmation (see scheme HD2). This is because a deductive consequence of observing the evidence E is that at least one of the elements of the conjunction of T1 and A is not true.

(2) Evidence E is a counterexample to a theory T1 if and only if it holds that $(T1 \wedge A) \nvdash E$, and there is a theory T2 such that $(T2 \wedge A') \vdash E$. In words, E is a counterexample to a theory T1 if and only if E cannot be deduced from T1 and the auxiliary assumptions of A (E is not a deductive consequence of T1), but there is another, competing theory T2 of which E is a consequence.

The tacit assumption behind this definition is that we have observed E (and not its negation), or we take E to be the evidence available to us. This notion of counterexample is related to the method known as "inference to the best explanation" (IBE).[8] In this case, we compare two or more competing theories with respect to the evidence E in question in terms of their (deductive or inductive) explanatory power. If theory T2 is able to provide an explanation of evidence E while theory T1 is not (after taking into account auxiliary assumptions A or A' relevant to the explanation), or if T2 provides a *better* explanation of E than T1, then E is positive evidence for T2 and negative evidence for T1.

How do these two notions of counterexample and associated inference schemes relate to testing theories of conditionals? Each of them has a function. If we test each theory of conditionals in isolation, HD method of testing is in charge and the use of the first notion of counterexample comes into play. However, if we want to compare individual theories also with each other, we need both notions of counterexample and also use IBE as a methodological device. In either case, however, what we consider positive or negative evidence depends largely on what requirements we place on the theories we are testing. And these requirements in turn depend on the general assumptions we make about language, the nature of the meaning of linguistic expressions, or the methodological assumptions we adopt. But this means that methodologically consistent testing of competing theories against each other is only possible if these general theoretical assumptions and goals, as well as the claims about what will count as the crucial kind of evidence, are shared in the background of their testing. However, the types of data, evidence and criteria we encountered in section 3 show that agreement on clear methodological criteria

[8] For a classical defense of IBE as a methodologically superior rule of hypotheses-evaluation, see Lipton (2004).

in this area is lacking for the time being. Since general and specific arguments of various kinds can be found for and against any of the theories in question, their existence alone cannot decide which of the theories is methodologically superior. Is it possible to give different weight to different arguments from the field? If so, on the basis of what criteria? We do not seem to have an answer to these questions. Or when someone formulates a counterexample in the form of a natural language inference that is a special case of a particular inferential rule, do we agree that the theoretical system of which the rule is a part should be rejected? Or do we choose to ignore these counterexamples on the grounds that the theory in question exhibits certain theoretical values to a greater extent? To these and other related questions, we seem to have no answer. And until we have these answers, we cannot even judge which theory has the upper hand over its competitors.

**5. Conclusion**

In this study, I have drawn attention to some of the methodological problems facing the testing and evaluation of semantic theories of indicative conditionals. The selection of three theories – the material implication theory, Stalnaker's theory, and Adams and Edgington's suppositional theory – merely illustrated the general problem: The fact that there is no consensus among theorists of conditionals as to which theory is the best one is a consequence of the lack of a broader agreement among them on the methodological assumptions, criteria, and type of evidence by which they would consistently evaluate the theories both individually and among each other. When we take a closer look at the kinds of data, evidence and criteria that are found in this area, we encounter a field of diverse evidence and criteria in favor and against the theories in question, without so much needed hierarchization. Moreover, it turns out that although the testing of these theories is schematically similar to the testing of other scientific theories, the nature and variety of auxiliary assumptions underlying the derivation of testable predictions of the theories of conditionals points to a greater methodological indeterminacy.

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