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## Conditionals

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### Form and Meaning

Conditionals are complex sentences built up from two constituent clauses, called the *antecedent* and the *consequent*; alternatively, the terms *protasis* and *apodosis* are found in the linguistic literature. English conditionals are typically of the form *if A, (then) B*, where *A* and *B* are the antecedent and consequent, respectively. Some examples are given in (1).

- (1a) If the sun comes out, Sue will go on a hike.
- (1b) If the sun came out, Sue went on a hike.
- (1c) If the sun had come out, Sue would have gone on a hike.

In the linguistic and philosophical literature, a distinction is commonly drawn between *indicative* conditionals, such as (1a) and (1b), and *subjunctive* or *counterfactual* conditionals, like (1c). This classification is not uncontroversial: some authors would draw the major dividing line between (1a) and (1c) on the one hand and (1b) on the other. However, we adopt the standard classification and focus on indicative conditionals (see also **Counterfactuals**). The class of indicatives may be further divided into *predictive* and *nonpredictive* conditionals, illustrated in (1a) and (1b), respectively. Despite subtle differences, these share a common semantic core and have similar logical properties. We do not distinguish between them in this discussion.

In general, *if A, B* asserts that *B* follows from, or is a consequence of *A*, without asserting either *A* or *B*. Often the relation in question is causal (*A* causes *B*) or inferential (*B* is inferable from *A*). Other uses include the statement that *B* is *relevant* if *A* is true (2a), conditional speech acts (2b), and metalinguistic comments on the consequent (2c).

- (2a) If you want to meet, I am in my office now.
- (2b) If you will be late, give me a call.
- (2c) If you excuse my saying so, she is downright incompetent.

The form *if A, B* is neither necessary nor sufficient for the expression of conditionality. Inverted forms, as in (3a), are used as conditional antecedents. Sentences like (3b) and (3c) also typically have conditional interpretations.

- (3a) Should the sun come out, Sue will go on a hike.
- (3b) Buy one – get one free.
- (3c) Give me \$10 and I will fix your bike.

On the other hand, some *if-then* sentences do not fit the semantic characterization and are not considered conditionals, as in (4).

- (4) If these problems are difficult, they are also fascinating.

Despite these marginal counterexamples, *if* is clearly the prototypical conditional marker in English. Other languages show more diversity in their expression of conditionality. The German conditional marker *falls* is freely interchangeable with *wenn* ‘when/if’, which also functions as a temporal conjunction. Japanese employs a family of verbal suffixes and particles (*-ba*, *-tara*, *-tewa*, *nara*, *to*), each of which adds subtle semantic and pragmatic constraints to the conditional meaning and some of which may also express temporal relations without conditionality (*-tara* ‘and then’; *A to B* ‘upon *A*, *B*’). Languages also vary in the extent to which they overtly mark (non)counterfactuality. In Japanese, the distinction is usually inferred from context; Classical Greek, on the other hand, has an elaborate inventory of markers of different degrees of hypotheticality.

In all languages, the interpretation of conditionals is determined and constrained by expressions of temporal relations, modality, quantification, and a variety of pragmatic factors. For instance, the differences in (1a) through (1c) arise from the interaction of the marker *if* with the tenses and modal auxiliaries in the constituent clauses.

For descriptive surveys of conditionals in English and other languages, see Traugott *et al.* (1986), Athanasiadou and Dirven (1997), Dancygier (1998), and Declerck and Reed (2001).

### Truth-Conditional Semantics

The formal semantic approach in linguistics and philosophical logic is concerned with the truth conditions of sentences and their logical behavior. Conditionals are among the most extensively studied linguistic constructions in this tradition and pose specific challenges, which have been addressed in a number of ways.

#### Material Conditional

In classical Fregean logic, *if A, B* is interpreted as the *material conditional* (also called material implication) ‘ $\rightarrow$ ’:

- (5)  $A \rightarrow B$  is true iff either *A* is false, or *B* is true, or both.

The material conditional is a truth function on a par with conjunction and disjunction. However, while there is general agreement that the latter are well suited to capture the truth conditions of *and* and *or*, the logical properties of the material conditional do not well match those of conditional sentences. For example,  $A \rightarrow B$  and  $A \rightarrow \neg B$  are mutually consistent, and the falsehood of  $A$  is sufficient for the truth of both, hence of their conjunction. But (6b) is intuitively contradictory and does not follow from (6a). Likewise, the negation of  $A \rightarrow B$  is equivalent to  $A \wedge \neg B$ , but (6c) and (6d) are not intuitively equivalent.

- (6a) Today is Saturday.
- (6b) If today is Friday, it is raining, and if today is Friday, it is not raining.
- (6c) It is not the case that if the team wins, I will be happy.
- (6d) The team will win and I will be unhappy.

Strictly truth-functional theories employ the material conditional in spite of these shortcomings, since no other truth function comes any closer to capturing our intuitions about conditionals. One way to reconcile the approach with linguistic intuitions is to augment the truth conditions with pragmatic conditions on use. Jackson (1987), building on Grice's original proposals, appealed to probabilistic 'assertibility' conditions. For *if A then B* to be assertible, two conditions must be met:  $A \rightarrow B$  must be highly probable, and it must remain highly probable in the event that  $A$  turns out true. Jackson noted that this comes down to the requirement that the conditional probability of  $B$  given  $A$  be high.

### (Variably) Strict Implication

An alternative reaction to the problems of the material conditional is to conclude that conditionals do not express truth functions. Instead, most current theories assume that *if A then B* asserts that  $A$  cannot be true without  $B$  also being true. This is typically spelled out in the framework of *possible worlds*:

- (7) *If A then B* is true at a possible world  $w$  relative to an accessibility relation  $R$  iff for all possible worlds  $w'$  such that  $wRw'$  and  $A$  is true at  $w'$ ,  $B$  is true at  $w'$ .

The relation  $R$  determines the *modal base* (Kratzer, 1981), the set of possible worlds that are relevant to the truth of the conditional at  $w$ . Definition (7) subsumes the material conditional as the special case that  $R$  is the identity relation, so the only world relevant at  $w$  is  $w$  itself. At the other end of the spectrum lies *strict implication*, under which all possible worlds are relevant and the conditional is true iff  $B$  is a logical consequence of  $A$ .

These extreme cases are rarely relevant in linguistic usage. Usually, conditionals are evaluated against speakers' beliefs, the conversational common ground, the information available in a given situation, possible future courses of events in branching time, or other background assumptions. All of these interpretations correspond formally to different choices of the accessibility relation. The fact that the intended reading need not be overtly marked is a source of versatility and context dependence. A given conditional can be simultaneously true with respect to one modal base and false with respect to another. Thus, (8) may be objectively true, but believed to be false by a speaker with insufficient information or false beliefs.

- (8) If this material is heated to 500°C, it will burn.

The definition in (7) makes room for variation and context dependence of the modal base and overcomes some of the limitations of the material conditional. However, like the latter, it fails to account for the invalidity of certain *nonmonotonic* inference patterns involving conditionals. For instance, under both analyses, a true conditional remains true under Strengthening of the Antecedent (*if A then B* entails *if C and A then B*). Intuitively, however, it is possible for (8) to be true while (9) is false.

- (9) If this material is placed in a vacuum chamber and heated to 500°C, it will burn.

There are several ways of addressing this problem. We will describe two of them, each departing from definition (7) in a different direction.

### Relative Likelihood

The first approach takes examples (8) and (9) to show that in cases like (8), not all  $A$ -worlds in the modal base are relevant for the truth of the conditional, but only those that satisfy implicit defaults or 'normalcy' assumptions. The listener will assume that air was present (as in [8]) unless this is explicitly denied in the antecedent (as in [9]).

Kratzer (1981) represented such assumptions as an *ordering source*, a set of propositions that are 'normally' true at  $w$ . This set induces a preorder on the worlds in the modal base:  $w''$  is at least as normal as  $w'$  iff all the propositions in the ordering source that are true at  $w'$  are also true at  $w''$ . The interpretation of conditionals is sensitive to the relation in (10).

- (10) *If A then B* is true at  $w$  relative to a model base  $MB$  iff for every  $A$ -world  $w'$  in  $MB$ , there is an  $AB$ -world in  $MB$  that is at least as normal as  $w'$  and not equalled or outranked in normalcy by any  $A$ -world in  $MB$  at which  $B$  is false.

This offers a solution to the problem posed by (8) and (9). Suppose the material is normally not placed in a vacuum chamber. Then every antecedent-world at which it is, is outranked in normalcy by one at which it is not; thus, (8) may be true while (9) is false.

Formally, the order induced by the ordering source is similar to the relation of ‘comparative similarity’ between possible worlds that is at the center of the Stalnaker/Lewis theory of counterfactuals (*see* the article **Counterfactuals** for details; Lewis, 1981, for a comparison; and Stalnaker, 1975, for an account of indicative conditionals that refers to this notion). The term ‘relative likelihood’ is applied to such orders in artificial intelligence (Halpern, 2003). Like the modal base, the ordering source is subject to under-specification and context dependence. Different ordering sources correspond to different readings of the conditional. Besides normalcy, Kratzer (1981) considers ordering sources that rank worlds according to desires, obligations, and other criteria.

### Probability

The second approach to dealing with the nonmonotonicity of conditionals does not manipulate the modal base but instead rejects the universal quantification over possible worlds as ill suited for modeling the notion of consequence that speakers employ in interpreting conditionals. On this account, *if A then B* asserts not that all *A*-worlds are *B*-worlds but rather that the conditional probability of *B*, given *A*, is high. In other words, the posterior probability of *B* upon learning *A* would be high, or, alternatively, a world that is randomly chosen from among the *A*-worlds would likely be one at which *B* is true. Different modal bases and ordering sources correspond to different (subjective or objective) probability distributions over possible worlds. Adams (1975) developed a theory of *probabilistic entailment* in which just those inference patterns that are problematic for the classical account, such as Strengthening of the Antecedent, are no longer predicted to be valid.

The intuitive appeal of the probabilistic approach is offset somewhat by the fact that it necessitates a rather profound rethinking of the logical basis of semantic theory. Lewis (1976) showed that a conditional probability cannot in general be interpreted as the probability that a proposition is true, hence that the central premise of the probabilistic account is at odds with the idea that conditionals denote propositions (for detailed discussions see Edgington, 1995; Eells and Skyrms, 1994). Some authors conclude that conditionals do not have truth values (Adams, 1975) or that the conditional probability is only relevant to their use and independent of their truth

conditions (Jackson, 1987). Another approach is to assign nonstandard truth values to conditionals in such a way that the problem is avoided (Jeffrey, 1991; Kaufmann, 2005).

### Summary

Kratzer’s theory is the most influential one in linguistics. The probabilistic approach has been studied extensively in philosophy and, more recently, artificial intelligence. Many other options have been explored. In addition to the works cited above, for overviews and specific proposals the reader is referred to Bennett (2003); Gärdenfors (1988); Harper and Hooker (1976); Harper *et al.* (1981); Jackson (1991); Nute (1980, 1984); Sanford (1989); Stalnaker (1984); Veltman (1985); and Woods (1997). It is not always clear whether there are empirical facts of a purely linguistic nature that would decisively favor one approach over another. With such criteria lacking, the choice depends on the purpose of the analysis at hand and other extralinguistic considerations (e.g., assumptions about rational behavior or psychological reality, or tractability in computational modeling).

*See also:* Counterfactuals; Formal Semantics; Inference: Abduction, Induction, Deduction; Modal Logic; Possible Worlds: Philosophical Theories.

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## Conference Interpreting

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### Introduction

Conference interpreting is the type of interpreting that first attracted public attention and that was the first to generate substantial literature on training and theoretical issues. This article highlights some of its aspects, starting with a definition and characterization, following with a presentation of the conference interpreting profession and concluding with a discussion of research in the field. This review is necessarily incomplete. For further insight into practical aspects of conference interpreting, see Jones (1998). For a thorough and comprehensive review of research into interpreting – albeit with debatable evaluative comments – see Pöchhacker and Shlesinger (2002) and Pöchhacker (2004). Milestone works in the field are Gran and Dodds (1989), Gerver and Sinaiko (1978), Gambier *et al.* (1997), and Garzone and Viezzi (2002). There are other good reference books in Chinese, Czech, French, Italian, Japanese, Russian, and Spanish, which cannot be listed here (the CIRIN Web site at <http://perso.wanadoo.fr/daniel.gile/> offers regular bibliographic information on conference interpreting research or CIR).

### Conference Interpreting: A Social Definition

In spite of what the name conference interpreting suggests, conference interpreters work not only in conferences but also in other settings, including meetings of committees and working groups in international organizations, visits of personalities, meetings of boards of directors of large corporations, medical, information technology, economic and other scientific and technical training seminars, TV programs, arbitration proceedings, and even court trials. In other words, their activity partly overlaps with liaison interpreting, court interpreting and media interpreting.

Conference interpreting is sometimes confused with simultaneous interpreting (see, for example, Christoffels, 2004: 1), in which the interpreter sits in a booth and speaks at the same time as the speaker s/he is translating. Actually, conference interpreting as a profession started in the exclusive form of consecutive interpreting (the speaker makes an utterance, stops for the interpreter to translate it, then resumes his/her speech, stops again for the interpreter to translate the second passage, and so on). Although simultaneous interpreting (SI) has become the most popular mode of interpreting, the consecutive mode is still much in demand, especially for one-to-one interaction, both in politics and in business. By contrast, SI is also used in court interpreting.