The real, the fake, and the fake fake: In counterfactual conditionals, crosslinguistically
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CHAPTER 4

Counterfactuality of Antecedent, Real or Fake?

What makes counterfactuals counterfactual? Why are the examples in (243) felt to convey that *it did not rain yesterday, it is not raining now and it is not going to rain tomorrow*?

(243) a. If it had rained yesterday, I would have cancelled the trip.
    b. If it had been raining now, I would have cancelled the trip.
    c. If it had rained tomorrow, I would have cancelled the trip.¹

This chapter is concerned with the nature of the counterfactuality of the antecedent in counterfactual conditionals: the inference that the antecedent is false or, equivalently, that the negation of the antecedent is true – henceforth, the falsity inference of counterfactual conditionals. Does this inference always accompany such conditionals? And if so, is this inference an entailment, a presupposition or an implicature? Furthermore, how does this inference come about (morpho-syntactically and semantically-pragmatically)?

Entailments, presuppositions and implicatures exhibit different properties and behave differently in certain environments such that it is possible to distinguish an entailment from a presupposition and in turn from an implicature if we look for categorical properties and follow certain diagnostic tests. This means that it is possible to determine the type of the falsity inference we are dealing with: this chapter concludes – albeit somewhat hesitantly – that it must be a presupposition in dynamic semantics terms. I will explain this notion in

¹If an appropriate context is needed: imagine this sentence is asserted right after the speaker heard the weather forecast, (and yes it said tomorrow the weather will definitely be sunny).
detail, and show that a simple theory of morpho-syntactic markedness together
with a semantic-pragmatic theory alluding to information states will explain
how the falsity inference comes about.

To be able to delve in the heart of the matter that concerns us, some
definitions are in order.

4.1 Preliminaries

In this section, I will review the definitions of entailment, presupposition, and
implicature in static and dynamic approaches to meaning. Meaning, in static
semantics, is defined in terms of truth. In dynamic semantics, it is defined in
terms of context change potential.

**Meaning in a static approach:** You know the meaning of a sentence if you
know the conditions under which it is true.

**Meaning in a dynamic approach:** You know the meaning of a sentence if
you know the change it brings about in the information state of anyone
who accepts the news conveyed by it.

We must get more precise. Within the framework of possible world semantics
this can be done as follows.

On the static account, the heart of a semantic theory is given by a definition
that spells out in a compositional way what the truth value \( \lbrack \varphi \rbrack^c_w \) is of a given
sentence \( \varphi \) asserted in a given context \( c \) about a given world \( w \). Thus the
meaning \( \lbrack \varphi \rbrack \) of a sentence is a function that returns a truth value given a
context of utterance \( c \) and a reference world \( w \). This set up reflects the fact
that in general one cannot assign a truth value to 'just' a sentence. In general
the truth value of a sentence will vary with the context in which it is asserted
– who said it, to whom, where, when? – and with the situation about which it
was asserted.

One aspect of the context of utterance is the common ground of the con-
versation, the body of information mutually taken for granted by the discourse
participants. Formally, the common ground will be represented by a set of pos-
sible worlds. The discourse participants mutually take for granted everything
that is true in all of these worlds.

In a dynamic approach, the main definition explains in a compositional way
which information state \( s[\varphi] \) is the result of updating a given information state
\( s \) with a given sentence \( \varphi \). Thus the meaning of a sentence \( \varphi \) is an operation on

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2This notion of meaning underlies much work in formal semantics. Its origin can be traced
back to Robert Stalnaker’s work on presupposition and assertion, see for instance Stalnaker
(1974). It took further shape in, for example, Kamp (1981), Heim (1982), Groenendijk and
Stokhof (1991), and Veltman (1996).

3In the following we will use ‘1’ to denote the truth value \( true \), and ‘0’ to denote \( false \).
information states, a function $\phi$ that takes information states both as input and as output.\footnote{It is common practice in dynamic semantics to use postfix notation and write $s[\varphi]$ rather than $[\varphi](s)$. This way one can write `$s[\varphi_1][\varphi_2]$' rather than `$[\varphi_2][([\varphi_1](s))$' for the result of updating the state $s$ with first $\varphi_1$ and then $\varphi_2$, thus maintaining the order in which $\varphi_1$ and $\varphi_2$ may have been asserted.}

In simple cases an information state can be modelled by a set of possible worlds. Think of it this way: given the information at hand each of these worlds might turn out be the actual one. If the agent concerned has no information at all, any world might be the real one. As the information increases the set shrinks.

### 4.1.1 Entailment

Static and dynamic semantics each come with a different notion of logical validity. The static notion is the classical Aristotelean notion that defines logical validity as truth preservation.

**Entailment in a static approach:** The premises $\varphi_1, \ldots, \varphi_n$ (logically) entail the conclusion $\psi$ if $[\psi]_{w}^c = 1$ in all cases in which $[\varphi_i]_{w}^c = 1$ for every $i$ ($1 \leq i \leq n$).

For the dynamic definition we need to introduce first the notion of acceptance. A sentence $\varphi$ has been accepted in a state $s$ if updating $s$ with $\varphi$ yields $s$ itself as the resulting state. (In such a case $\varphi$ does not bring any new information). Whenever $\varphi$ has been accepted in $s$, we write $s \models \varphi$. So, formally, the definition says that $s \models \varphi$ iff $s[\varphi] = s$. Instead of writing ‘$\varphi$ has been accepted in $s$’, we will often write ‘$s$ supports $\varphi$’.

On the dynamic account an argument is valid iff updating any information state with the premises $\varphi_1, \ldots, \varphi_n$ (in that order), yields an information state in which the conclusion $\psi$ is accepted. Or, more precisely:

**Entailment in a dynamic approach:** The premises $\varphi_1, \ldots, \varphi_n$ (logically) entail the conclusion $\psi$ iff for any information state $s$ for which $s[\varphi_1] \ldots [\varphi_n]$ is defined, it holds that $s[\varphi_1] \ldots [\varphi_n] \models \psi$.

We will write `$\varphi_1, \ldots, \varphi_n \models \psi$' if $\psi$ is statically entailed by $\varphi_1, \ldots, \varphi_n$, and `$\varphi_1, \ldots, \varphi_n \models \psi$' in the dynamic case.

Even though the notions of entailment are different, this does not necessarily mean the logics generated by these notions differ, too. For example, most of the theories, whether they are developed in the static or in the dynamic framework, predict that (244a) does not entail (244c). But if you add (244b) as an extra premise, then you can draw the conclusion in (244c).

(244)  
\begin{enumerate}
  \item If John had been at the party, it would have been fun.
  \item If John had been at the party, Mary would have been at the party.
  \item If John and Mary had been at the party, it would have been fun.
\end{enumerate}
4.1.2 Presupposition and Accommodation

Static and dynamic semantics each come with a different notion of presupposition, as can be seen in the following definitions.

**Presupposition in a static approach:** The sentence \( \varphi \) presupposes the sentence \( \psi \) iff both \( \varphi \models \psi \) and \( \neg \varphi \models \psi \).\(^5\)

**Presupposition in a dynamic approach:** The sentence \( \varphi \) presupposes the sentence \( \psi \) iff for all information states \( s \), \( s[\varphi] \) is defined only if \( s \models \psi \).

Notice that the static definition makes no sense if we assume that all sentences are either true or false. In a bivalent system the static definition would yield that all presuppositions are tautologies.\(^6\) Therefore, for the definition to work one needs a framework in which besides true and false, there is a third truth value undefined. In such a system, a presupposition \( \psi \) can be false, and if this happens to be the case, the sentence \( \varphi \), whose presupposition it is, is neither true nor false.

A famous example of a sentence that would according to many lack a truth value due to presupposition failure is (245).

(245) The king of France is bald.

Probably this sentence is the most discussed sentence in analytic philosophy of the 20\(^{th}\) century. All theories of presupposition say that it presupposes that there is exactly one king of France. Given that there is none, we cannot assign a truth value to it. At least that’s what the static definition yields.

The example goes back to Russell (1905), who dealt with it in a bivalent framework. He was not concerned with presuppositions as such – in fact, he does not use the term presupposition anywhere. He wanted to explain how we can meaningfully assert (245), without having to assume that somewhere (maybe not in the real world) there must exist (maybe subsist) something that the definite description ‘the king of France’ refers to. On his account, (245) is true iff there exists a unique king of France and he is bald; it is false, otherwise. So, the sentence is false if either there is no unique king of France or there is one, but he is not bald.

That (245) became the canonical example for talking about presupposition and presupposition failure is due to Strawson (1950) who was the first to assume a three valued logic:

The sentence, “The king of France is wise”, is certainly significant; but this does not mean that any particular use of it is true or false. We use it truly or falsely when we use it to talk about some one; when, in using the expression, “The king of France”, we are in fact

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\(^5\)Here ‘\( \neg \)’ stands for negation ‘it is not the case that’.

\(^6\)If both \( \varphi \models \psi \) and \( \neg \varphi \models \psi \), then \( \varphi \lor \neg \varphi \models \psi \), which means that \( \psi \) follows from a tautology, and hence must itself be a tautology.
mentioning someone. The fact that the sentence and the expression, respectively, are significant just is the fact that the sentence could be used, in certain circumstances, to say something true or false, that the expression could be used, in certain circumstances to mention a particular person; and to know their meaning is to know what sort of circumstances these are. So when we utter the sentence without in fact mentioning anybody by the use of the phrase, “The king of France”, the sentence doesn’t cease to be significant: we simply fail to say anything true or false because we simply fail to mention anybody by this particular use of that perfectly significant phrase. It is, if you like, a spurious use of the sentence, and a spurious use of the expression; though we may (or may not) mistakenly think it a genuine use.

Strawson observes that (245) lacks a truth value if asserted, say, in the twentieth century; on the other hand, it may have well been true if asserted in a time in which France still had a king and this king was bald. From this he concludes that it is not sentences that have truth values or lack them, but assertions of sentences.

In Strawson (1950), as cited above, presupposition is a purely semantic notion. It is a matter between the sentence and the state of the world about which it is asserted. If the presupposition is not satisfied, the assertion lacks a truth value. In later years Strawson (1974) slightly changes his position. He still believes that we use a definite description to refer to a pre-given object, and not to state that there exists such an object, but he is willing to assign a truth value to statements in which this reference fails.

The sense in which the existence of something answering to a definite description used for the purpose of identifying reference, and its distinguishability by an audience from anything else, is presupposed and not asserted in an utterance containing such an expression, so used, stands absolutely firm, whether or not one opts for the view that radical failure of the presupposition would deprive the statement of a truth-value. Strawson (1974:85)\(^7\)

On this account, satisfaction of the presupposition is not so much a necessary condition for a statement to have a truth value, but a necessary condition for it to be felicitous.

From here, it is just one step to the pragmatic notion of presupposition developed by Stalnaker in Stalnaker (1973) and subsequent papers (cf. Stalnaker (1974 reprinted in 1999).

Stalnaker would agree that (245) ‘presupposes’ that there is a unique king of France, but for him this does not mean that it should be true that there exists a unique king of France, but rather that for (245) to be used successfully in communication the speaker has to assume or believe this. In addition, the speaker should also assume or believe that the addressee assumes or believes
this, and that the addressee recognizes that he is making these assumptions (see Stalnaker 1999:51). If the presupposition is not satisfied this does not necessarily result in a truth value gap. Presuppositions put constraints on the contexts in which statements can be made, not necessarily on truth conditions.

One might explain why it is appropriate for a speaker to say ‘the Queen of England is bald’ only if he presupposes that England has a queen in terms of the following two assumptions: first that the statement lacks a truth value unless England has a queen, and second that one normally presupposes that one’s statements have a truth value. But one also might explain the fact in a different way.

Stalnaker (1999:53)

The alternative explanation Stalnaker is alluding to is one in terms of a general theory of conversation. We will come to discuss this later.

Let us now turn to the dynamic semantic notion of presupposition. On the dynamic account, for a sentence \( \varphi \) to be interpretable in a state \( s \), its presuppositions must have been accepted in the state \( s \). Presupposition failure occurs when some of the presuppositions of \( \varphi \) are not supported by the information state \( s \). In such a case, the update with the sentence is undefined. The addressee will be at a loss, not knowing what to do with the sentence in question. A speaker should try to avoid such a situation, and not assert \( \varphi \) unless s/he can safely assume that the addressee already assumes or believes the presuppositions involved.

This is an exaggeration, though. In practice, the addressee does not really always get lost. Here the notion of accommodation is instructive. David Lewis gave the phenomenon its name. He formulated ‘the rule of accommodation for presuppositions’ as follows.

The Rule of Accommodation for Presuppositions: If at time \( t \) something is said that requires presupposition \( P \) to be acceptable, and if \( P \) is not presupposed just before \( t \), then – ceteris paribus and within certain limits – presupposition \( P \) comes into existence at \( t \). Lewis (1979:340)

In other words, upon hearing a sentence which requires a certain presupposition, the addressee recognizes the presupposition and realizes that this presupposition is expected to be part of his/her information state. If it is not already part of this information state, s/he can accommodate it. S/he then fixes the information state such that it supports this presupposition. The conversation can, thus, continue without interruption.

A presupposition \( \psi \) can be accommodated in a state \( s \) if \( \psi \) is not rejected by \( s \). Consider example (245) again. If I tell you today that the king of France is bald, you will not accept my sentence as your information state rejects the presupposition.

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In a static set up, this means that there should be a world \( w \in s \) such that \( \llbracket \psi \rrbracket_w = 1 \); in a dynamic framework, this means that \( s[\psi] \neq \emptyset \).
proposition that France is a monarchy. This means that the presupposition ‘there is a unique king of France’ of the sentence cannot be accommodated by your state. Instead, you will attempt to indicate that I presuppose something that is incompatible with your information state. You will not reply with a sentence like (246), but probably utter something as in (247b), (247a), or (247c).

(246) That’s not true!
(247) a. Hold on! There is no king of France.
   b. Hey, wait a minute! France is not a monarchy. von Fintel (2004)
   c. I’m afraid you must be under a misapprehension. France is not a monarchy. There is no king of France. Strawson (1950:330)

What happens in the last three examples is called suspension. For example, ‘Hey, wait a minute!’ is a discourse suspending phrase. By using such a phrase, you suspend the discourse until presuppositions are put back in order. In other words, you neither accept nor reject my statement, but challenge its presupposition. If you were to reply with (246) without suspending discourse, you would be challenging my statement, but not its presuppositions. This makes the ‘hey, wait a minute’ an important test which distinguishes presuppositions from entailments and from the pragmatic ‘implicatures’ discussed in the next section.9

There are more tests that a sentence $\psi$ must pass to be called a presupposition of $\varphi$.

One such test is that presuppositions project under negation. This means that it should hold that if $\psi$ is a presupposition of $\varphi$, $\psi$ is also a presupposition of $\neg \varphi$.

For the static semantic notion of presupposition this follows directly from the definition. And also for the dynamic semantic notion it is obvious that this is the case. (If a proof is wanted: Suppose that $\varphi$ presupposes $\psi$ in the dynamic sense of the word, and consider $\neg \varphi$. By definition of negation, for any state $s$, $s[\neg \varphi] = s \setminus s[\varphi]$. Clearly the latter is defined iff $s[\varphi]$ is defined, which is the case iff $s \models \psi$. For the pragmatic notion of presupposition it is not so obvious that presuppositions project over negation. One needs to show that if for $\varphi$ to be ‘felicitous’ $\psi$ must be part of the common ground, this also holds for $\neg \varphi$. We would need to know exactly what ‘felicitous’ means here, to get an explanation off the ground.

Intuitively, presuppositions also project over modal expressions, questions, and antecedents of indicative and subjunctive11 conditionals as the following examples show:

9’Hey, wait a minute!’ is a test used by von Fintel (2004) to distinguish presupposition from assertion. This test is a variation of an earlier suggestion by Shanon (1976).
10Here $X \setminus Y = \{x \in X \mid x \notin Y\}$, i.e the complement of $Y$ in $X$.
11Subjunctive here is used as a notional, philosophical, term and not as a morphological distinction.
(248) Maybe the king of France is bald.
(249) Is the king of France bald?\(^\text{12}\)
(250) If the king of France is bald,....
(251) If the king of France had been bald,....

For all these sentences to “make sense” it is necessary that there is a unique
king of France. A satisfactory theory of presupposition should explain why this
is so. Why are the presuppositions of a sentence \(\varphi\) also presupposed by \textit{maybe} \(\varphi\),
\(\varphi\) , \(\varphi\) , if it is the case that \(\varphi\) and if it had been the case that \(\varphi\)? The explanations
will involve not only the definition of presupposition one takes as a starting
point, but also the semantic theories developed for the sentences concerned.
For the standard semantic treatment of (epistemic) modalities, indicative con-
ditionals and counterfactuals within dynamic semantics these explanations are
simple. Just like in the case of negation, the update operation with any of the
sentences concerned involves, among other things, an update with the sentence
carrying the presupposition; so it is a necessary condition for the former to be
defined that the latter be defined (see Veltman 1996, Gillies 2004, and Veltman
2005).\(^\text{13}\)

4.1.3 Implicature and Cancellation

The notion of implicature was introduced by Grice in his William James Lect-
One can implicate something by what one says without explicitly saying it –
it’s something that must be inferred, and something that can be inferred given
some general principles guiding human communication (see Grice 1989). The
principles Grice has in mind are the very general Co-operative Principle and
some more specific Maxims of Conversation.

\textit{The Co-operative Principle:} Make your contribution such as it is required, at
the stage at which it occurs, by the accepted purpose or direction of the
talk exchange in which you are engaged.

\(^\text{12}\)Both the static and the dynamic definition of presupposition have to be extended to
cover the case of questions. It would lead us too far away from our main concern to deal with
this here.

\(^\text{13}\)The projection problem for presupposition was first discussed in Morgan (1969). The
projection problem is concerned with compositionality of presuppositions in complex sen-
tences: how the presuppositions required by a complex sentence relate to the presuppositions
required by its component clauses, and why do presuppositions in such environments tend to
disappear? A static account, for example, dealing with this phenomenon is concerned with
how the truth value (or lack of truth value) of a complex sentence is a function of the truth
values (or lack of truth values) of the component clauses. Heim (1983) suggests that the
analysis of presupposition projection requires that the classical notion of meanings as truth
conditions be replaced with a dynamic notion of meanings as Context Change Potentials.
Dynamic accounts are therefore concerned with how parts of sentences become local contexts
which license the presuppositions of other parts. See, a.o., Beaver 2001.
Maxim of Quality: (i) Do not say what you believe to be false. (ii) Do not say what you do not have adequate evidence for.

Maxim of Quantity: (i) Make your contribution to the conversation as informative as is required. (ii) Do not make your contribution more informative than required.

Maxim of Relevance: Be relevant.

Maxim of Manner: (i) Avoid obscurity and ambiguity. (ii) Be brief and orderly.

Call a sentence $\varphi$ asserted in context $c$ pragmatically correct iff (i) the cooperative principle is observed, and either (ii.a) no maxim is breached, or (ii.b) some maxim is breached, but it is breached overtly.

Of course, in general speakers are supposed to observe all maxims, but sometimes that is not possible, or sometimes the overall cooperative principle is better served if one of the more specific maxims is flouted. In such cases, one is allowed to do so as long as it is clear to the audience that a maxim is flouted and what for.

Using the notion of pragmatic correctness, we can define the notion of implicature as follows:

**Implicatures in a static (truth conditional) approach**: a sentence $\varphi$ asserted in context $c$ (about world $w$) implicates $\psi$ iff for $\varphi$ to be pragmatically correct, the sentence $\psi$ needs to be true (in the world $w$).

**Implicatures in a dynamic approach**: a sentence $\varphi$ asserted in context $c$ implicates $\psi$ iff in order for $\varphi$ to be pragmatically correct, $\psi$ needs to be accepted in $c$.

Given these definitions there are two kinds of implicatures: those which arise when all maxims are observed, and those which arise when some maxim is breached (but breached overtly). Following Levinson (1983), I will refer to the first kind as standard implicatures, and to the second kind as floating implicatures.

In the case of presuppositions, the hearer cannot update with a sentence unless its presupposition is accepted. In the case of implicatures the hearer can only get the implicature after the update. Starting from the co-operative principle, it must be possible for the hearer to work out that a particular implicature is present. Or, as Grice calls it, implicatures are calculable. Updating with the sentence $\varphi$ eventually results in accepting the implicature $\psi$. Yet in

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14 It would be more in line with Grice’s own writings to speak of speakers implicating this or that rather than their assertions doing so. For our purposes this distinction is not vital.

15 The context $c$ here is supposed to include the speaker’s information state.

16 Interestingly, the calculability of implicatures is supported by experiments conducted by Chemla (2009) showing that implicatures require pragmatic reasoning which takes some time to compute (Schlenker 2009:5).
order to reach $\psi$ a certain amount of reasoning (calculation) takes place. In the case of a flouting implicature $\psi$, what happens is that some oddity arises upon updating with the sentence $\varphi$, and so the hearer decides that this update should merely result in a subordinate state. The hearer realizes that a maxim has been breached, yet maintains the assumption that the utterance is pragmatically correct and the speaker cooperative. S/he can then conclude that for this to be the case $\psi$ has to be accepted.

Here is one of the examples Grice gives to illustrate how a flouting implicature can be calculated. It involves the breaching of the Maxim of Relevance. Suppose (252) is what you receive as a recommendation letter for someone applying for a job.

(252) ‘Dear Sir, Mr. X’s command of English is excellent, and his attendance at tutorials has been regular. Yours, etc.’ Grice (1989:33)

Having read this, you will not be inclined to think Mr. X is the kind of candidate you should put on your short list. How do you reach this conclusion? When you read a recommendation letter, you expect the writer to be relevant; if you detect that the maxim of relevance has been breached you may still want to assume that the writer is nonetheless cooperative and is trying to convey something meaningful. This assumption allows you to infer the implicature that you probably should not hire the subject as his best qualities are not especially relevant – if Mr. X had better qualities, the writer would have indicated them.

A second important feature of conversational implicatures is that they can be cancelled. This holds in particular for standard implicatures. It happens for example when the speaker realizes that it was not pragmatically correct to utter $\varphi$ as it might have made the hearer think that he wanted to implicate $\psi$. The speaker can correct this by overtly cancelling the implicature $\psi$.

Here is an example. Suppose a speaker utters the two sentences in (253) consecutively.

(253)  
   a. John is meeting a woman tonight.
   b. It is his mother.

Anyone who knows that John is going to see his mother, should say ‘John is meeting his mother tonight’ rather than (253a) because that would be much more informative. After hearing (253a), the addressee will think that the speaker is not able to be more specific.\(^{17}\) The addressee might even come to think that the woman concerned must be somebody other than John’s mother or John’s wife or anyone specific in John’s life.\(^{18}\) When the speaker adds ‘It’s his mother’, this oh-la-la effect is gone, and the implicature is cancelled.

\(^{17}\)That’s what the addressee will think if he or she assumes the speaker is co-operative. Depending on the circumstances, the addressee might also think that the speaker is not willing to be more specific and prefers flouting the maxim of quantity.

\(^{18}\)Of course, the addressee will only infer this if he or she has some reason to assume that the speaker would have known if it had been one of these women.
Cancellability is a feature that sets conversational implicatures apart from semantic presuppositions. Another property that distinguishes implicatures from presuppositions, is their re-enforceability. Unlike presuppositions, implicatures can be made explicit without resulting in redundancy. Compare:

(254)  
  a. # The king of France is bald. There is a king of France.  
  b. I lost a hundred pearls. I found some of them, not all.

In short: (254a) sounds odd, (254b) is fine. ‘There is a king of France’ is a presupposition of the preceding sentence, ‘not all’ a conversational implicature. In stating ‘There is a king of France’ the speaker is restating something that is part of the truth-conditional content of the preceding sentence. But ‘not all’ is not part of the truth-conditional content of the preceding sentence. it is something the hearer has to calculate in the manner described above, and the speaker is just making sure s/he does.

4.1.3.1 Scalar Implicatures

A special type of standard implicatures are scalar implicatures. They arise specifically because of the assumption that both the quality and the quantity maxims are respected.

Also instrumental for understanding scalar implicatures is realizing that certain items belong to scales and form scalar alternatives with respect to a certain characteristic property. Consider the examples in (255).

(255) Scalar alternatives

  a. some, all
  b. or, and

Note that universal sentences are stronger (in the logical sense of the word) than existential sentences, and conjunctions are stronger than disjunctions. (256) exemplifies how scalar alternatives give rise to scalar implicatures. The implicature is indicated in (256b) and results from the fact that the stronger alternative, all, is not used in (256a).

(256) Scalar Implicatures

  a. The Philharmonic played some of Beethoven’s symphonies.
  b. They didn’t play all. Sauerland (2008, (15a,b))

The Gricean quantity maxim obligates a speaker to be as informative as possible. So, given a set of alternatives, ideally the speaker selects the most informative true alternative — true, because otherwise the quality maxim is not observed. Sauerland (2008) summarizes this with the following corollary which combines the quality maxim and the quantity maxim.

Sauerland’s corollary Make your contribution the most informative one of those you believe to be true!
This predicts that by uttering (256a) the speaker indicates that s/he does not believe the more informative alternative, with all.

Not believing that... is not the same as believing that not.... In particular, not believing that the Philharmonic played all Beethoven’s Symphonies is not the same as believing that they did not play all. To arrive at this stronger implicature, the hearer needs the additional assumption that the speaker is fully informed about the matter at hand, which may be a safe assumption in this particular case but certainly not in all. Consider the following contrast.

(257) a. I was walking down the beach and I found some pearls.
    b. I lost a hundred pearls. I found some.

(257a) does not implicate ‘not all.’ It does not follow that there are pearls that I didn’t find. In contrast, in (257b) does implicate ‘some, not all.’

4.1.3.2 Implicated Presuppositions

The notion of implicated presupposition (also called anti-presupposition or presuppositional implicature) is closely related to the notion of presupposition.

An implicated presupposition is a special kind of implicature. Its derivation is similar to the derivation of a scalar implicature. But where a scalar implicature arises from the assumption that the speaker is trying to be as informative as possible, an implicated presupposition arises from the assumption that the speaker is observing the following maxim, devised by Irene Heim.

Maximize Presupposition Make your contribution presuppose as much as possible! (Heim 1991, in Sauerland 2008, (21)).

The other thing that implicated presuppositions have in common with scalar implicatures is that they arise in a context in which there is a well defined set of alternative expressions that the speaker could have used instead of the expression s/he used. Actually, in the case of an implicated presupposition there is always only one alternative, and the only difference in meaning between the alternative expression and the expression the speaker used is that the former comes with a presupposition which the latter lacks. Here are some examples.

(258) presuppositional alternatives
   a. singular, plural
   b. the, a
   c. know, believe

Take (258b) for example: given the fact that the definite article presupposes uniqueness, Maximize Presupposition says that if a speaker believes that there

\footnote{It is still a matter of debate whether this principle can be reduced to ordinary Gricean principles (see Schlenker 2006).}
exists just one king, s/he should use the phrase ‘the king’ rather than ‘a king.’ So, if you hear somebody say ‘a king’ you will infer that there is more than one king, because if the presupposition of the definite article had been satisfied, the speaker would have used the definite article as Maximize Presupposition advises.

We should be a bit more careful here. All that the Maxim of Quality in combination with Maximize Presupposition yields is that the speaker does not believe that there exists just one king. That is the implicated presupposition. It takes a few more assumptions to get from there first to the conclusion that the speaker believes that there is more than one king, and then to the conclusion that there is more than one king.

The following quote, from Sauerland (2008), describes more generally how an implicated presupposition comes about.

An implicated presupposition results from the existence of a pair of two sentences $S$ and $S_0$, of which $S$ has a presupposition $p$ that $S_0$ lacks. Under circumstances where $\text{Maximize Presupposition}$ applies, it follows that $S_0$ can only be used when the speaker knows that $p$ is not satisfied. Specifically, if the speaker does not know whether $p$ holds, it follows that $p$ is not satisfied. Therefore the implicated presupposition of $S_0$ is that $p$ is not certain.

Sauerland (2008:7)

In many contexts it is warranted to take a few more steps, and get from the implicature that $p$ is not certain to the conclusion that $\neg p$. Here is an example, taken from the singular-plural domain, to illustrate this.\(^{20}\)

(259) Tom’s children must be well-behaved.

Asserting (259) can be felicitous even if John actually has one child only. A singular expression conventionally presupposes singularity. However, the implicated presupposition of the plural is not that the referent is plural, but only that the referent is not known to be singular. Again, to get from there to the conclusion that the referent is plural, one needs additional assumptions. We will discuss in the next section what assumptions these are. As for (259), this yields that one can infer that John has more than one child if one can safely assume that the speaker knows whether John has more than one child. But otherwise, the possibility of Tom having just one child is not ruled out.

4.2 A Short History of Falsity in Counterfactuals

In chapter 3, we distinguished three types of conditionals on morphosyntactic grounds: indicatives and two types of subjunctive (or CF) conditionals. In-
4.2. A Short History of Falsity in Counterfactuals

dicatives were distinguished from subjunctive or CF conditionals by extra fake past tense (i.e. NAV) morphology carried by the latter or by a dedicated CF morpheme in those languages that exhibit this strategy. Some CF conditionals were identified as doubly marked CF conditionals: those are the ones which include further marking, be it another fake past tense morpheme or a subjunctive morpheme or some kind of movement such as the I-to-C movement. The examples in (284) illustrate the differences.

(260)  a. Indicative: Maybe he will come to the party tonight. If he comes, it will be fun.
       b. Singly Marked CF: He might come to the party tonight, but the possibility is slim. If he came, I would be surprised.
       c. Doubly Marked CF: He will not come to the party tonight, he just told me. Too bad. If he had come, he might have enjoyed himself.

As such, we have identified a tri-partition of conditionals. Most logicians so far make a two way distinction, indicatives and subjunctives, where singly marked CF conditionals end up in one class together with the doubly marked ones. Many linguists however see a tri-partition. I agree with the latter and will discuss some of the differences between singly marked CF conditionals and doubly marked CF conditionals in §4.5. But first I will concentrate on the doubly marked, as that is the type of conditional that is counterfactual par excellence. If any type of conditional gives rise to the falsity inference, it is this one.

But again, what kind of inference is it?

4.2.1 An Entailment?

One has to go back to the first half of the twentieth century to find people who claim that a counterfactual conditional logically entails – in the static sense of the word – the falsity of its antecedent. According to Will (1947:236), for example, the subjunctive is “employed to affirm in conditional statements what are held to be true connections between antecedents which are false and their consequents.” And about (261) he says:

(261) If George had been at the meeting, he would have been embarrassed.

Will (1947:236)

“Although George was not at the meeting, as the use of the subjunctive here implies, and hence the statement ‘George was at the meeting’ is false, one wants to assert what would have been a consequence if the statement had been true and George had been present.”

\[21\]

\[21\]If only as an illustration of how complicated the matter is of explaining the falsity inference in a counterfactual, note the use of a counterfactual form in the quote to explain the counterfactual conditional.
One wonders whether Will and the others (see for instance Hampshire 1948:11, Pears 1950:59) who claimed that the falsity inference is an entailment, ever noticed that not only positive counterfactuals give rise to the falsity inference, but also their negations.

(262) It is not the case that if George had been at the meeting, he would have been embarrassed.

It would seem that if one thinks that (261) entails that George did not attend the meeting, one should think that (262) does so, too. In other words, it is just a small step from the idea that the falsity inference is an entailment to the idea that it is in fact a (static) semantic presupposition.

Judged by their writings, Will and the others who claimed that the falsity inference is an entailment, had other concerns. The main question at the time was whether the truth conditions of counterfactuals could be given in an extensional framework – nowadays, everybody agrees that the answer is ‘no’.

4.2.2 A Presupposition?

As far as I know, nobody ever claimed that the falsity inference is a (static) semantic presupposition. Before anybody could do so, Anderson (1951) showed it cannot be, because it cannot even be taken as a logical entailment. His counterexample was (263a). It is perfectly possible to assert (263b) after the counterfactual conditional in (263a).

(263) a. If he had taken arsenic, he would have shown exactly those symptoms.
   b. He, therefore, did take arsenic.

No contradiction arises. Given this consistency, the falsity inference cannot be an entailment – because it would clash with (263b).22

If the falsity inference is neither an entailment nor a (static) semantic presupposition, what is it? Stalnaker (1973) maintains the idea that the falsity of the antecedent is presupposed but for him it is not a presupposition in the static semantic sense, but a pragmatic presupposition. His way out is to weaken the notion of consequence involved: the presupposition does not logically follow from the counterfactual but it follows by default. It’s a rule with exceptions.

This is how Stalnaker explains how this rule comes about. He argues that it is normally the case that any proposition expressed

“must be compatible with what is taken for granted by the speaker to be true. [...] One role of the subjunctive mood in English is to indicate that this normal expectation is suspended. If this is right,

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22Notice however that it does not follow from (263a) that the “he” in the example took arsenic. One needs an extra premise, saying arsenic is the only poison giving rise to these symptoms.
then there will usually be a reason to use the subjunctive, say to make a conditional statement, or a claim that something is possible, only when the antecedent of the conditional, or the proposition said to be possible, is presupposed to be false. [...] Since one normally has reason to use the subjunctive only when this presupposition is present, one suggests that it is present by using the subjunctive.”

Stalnaker (1973:453)

Hence, when a counterfactual is used, the default is that the speaker presupposes that the antecedent is false. But every default has exceptions: there are circumstances (say, special cases) that the subjunctive can be meaningfully used even if this (normally required) presupposition is absent.

“It would therefore normally be inappropriate to use the subjunctive when the presupposition is not made. Hence, it is required in the sense defined. But there is no reason to conclude from this fact that a subjunctive conditional lacks a truth value when its antecedent is true.”

Stalnaker (1973:453)

We see, then, that presupposition here becomes a pragmatic notion.

Stalnaker’s view is further refined by Kai von Fintel in Fintel (1998), who argues that it is not so much the presupposition of the antecedent we should be talking about, but the presupposition of the subjunctive mood. By using the subjunctive, a speaker indicates that part of the relevant domain of quantification lies outside the common ground. Then when we say against such a background if \( \varphi \), . . . , it may happen that the restriction of this domain to the \( \varphi \)-worlds falls entirely within the common ground. The arsenic example is just an illustration of this, according to von Fintel (ibid.).

This is an important insight, but one keeps wondering how in by far the most cases we get the falsity inference anyhow.

4.2.3 An Implicature?

On Stalnaker’s account and that of his followers the falsity inference is a pragmatic presupposition, a default rule with exceptions. But if so, why not take it as an implicature that can be cancelled? What’s the difference? Actually, according to Simons (2007), there is not much difference. A pragmatic presupposition is just a special kind of implicature. Both involve Gricean reasoning and rely on the notion of co-operativity. However, to derive a pragmatic presupposition, it is not sufficient to attribute co-operativity to the speaker’s intentions. In addition, one must attribute a certain epistemic state to the speaker (involving a presupposition) in the absence of which the sentence cannot be given a cooperative interpretation (Simons 2007:2).

Karttunen and Peters were the first to claim that the falsity inference is a conversational implicature. They argue that it would be incorrect to postulate a general rule to the effect that a subjunctive conditional sentence presupposes
that its antecedent clause is false. They consider (264), a variant of Anderson’s arsenic example in (263a), arguing that

“this sentence would, if anything, normally tend to suggest that its antecedent clause is true, in contravention to any principle that this construction carries a counterfactual presupposition.”

Kartunnen and Peters (1979:5)

(264) If Mary were allergic to penicillin, she would have exactly the symptoms she is showing.

And they add:

“Instead, ‘the now-you-see-it-now-you-don’t’ behaviour of the supposed counterfactual is reminiscent of another kind of phenomenon which is by now familiar from the work of Grice, namely conversational implicature.”

Kartunnen and Peters (1979:7)

Nevins (2002), too, argues that the falsity of the antecedent must be an implicature because examples like (264) show that it can be cancelled. (In his case it’s not arsenic or penicillin but the measles that lead to the same symptoms). In addition, he claims that the falsity of the antecedent is re-enforceable. According to him, the fact that one can explicitly state in (265) that the butler is innocent without sounding redundant is evidence that the falsity of the antecedent is merely an implicature.

(265) If the butler had done it, the knife would be bloody. The knife was clean; therefore, the butler must be innocent.

Nevins (2002:447 (9b))

Notice however that we are dealing with a special context here — the speaker is giving a logical proof. In every logical proof the maxim of quantity is breached, often more than once. Given that the conclusion of a logically valid argument is mostly weaker than the premises, this is unavoidable. So, repetition is not uncommon, even essential in proofs. And making a presupposition explicit (265) might just be an example of that.23

If the falsity inference is an implicature, then how does it come about? It should be calculable from Grice’s maxims, but neither Kartunnen & Peters (1979) nor Nevins (2002) tell us how we can derive it within this framework.

23See Schulz (2007:241), who mentions that the redundancy test is problematic. See also Schlenker (2006, et seq.) and Fox (2008) who argue that repetition of a piece of information results in redundancy and is non-assertable without oddity only if its repetition is trivial. This is in contrast with the original view which simply says that a piece of information is redundant if it logically follows from the information at hand (cf. Stalnaker 1978, van der Sandt 1992).
4.2. A Short History of Falsity in Counterfactuals

Those who do tell us how this implicature comes about all maintain that we are dealing with what we called an implicated presupposition. Leahy (2011) is a good example here, and we will restrict ourselves to presenting his explanation. Note that Ippolito (2003) was the first to explain the falsity inference along these lines. She did so before any of the phrases ‘implicated presupposition’, ‘presuppositional implicature’ or ‘anti-presupposition’ was introduced.

“If the speaker were in a position to utter [the present (i.e. indicative) conditional], he would have done so; instead, he said something weaker (less informative). Thus, it must be the case that he was not in a position to utter [the present (i.e. indicative) conditional], . . . .”

Ippolito (2003:163)

Leahy’s (2010) explanation can be seen as a refinement of this. Leahy follows Stalnaker in claiming that subjunctive and indicative conditionals have the same truth conditions. What he adds to this is the claim that indicative conditionals presuppose that their antecedents are epistemically possible for their utterers and that counterfactuals have no presupposition. Hence, the presuppositions of the indicative and those of the counterfactual constitute a lexical scale.24

“The presuppositions of indicative and subjunctive conditionals must constitute a lexical scale: where the indicative and its counterfactual counterpart have the same truth conditions, their presuppositions must be asymmetrically ordered by logical strength. Furthermore, since the implicature arises when the counterfactual counterpart is uttered as opposed to the indicative alternative, it will be the presuppositions of the counterfactual that are logically weaker.”

Leahy (2010:13)25

According to Leahy (2010, 2011), when the subjunctive conditional is used by a speaker, the hearer applies Maximize Presupposition and will infer that the speaker does not believe that the antecedent is epistemically possible. It takes several steps to get from there to the conclusion that the antecedent is false. It’s not clear whether Leahy really intends this.

In fact one needs three additional assumptions, Authority (cf. von Fintel 2008, Chemla 2008), Competence (cf. Chemla 2008), and Reliability (cf. Schulz and van Rooij 2004).26

24Note that on Leahy’s account, this must be a pragmatic rather than a semantic presupposition. (Otherwise the truth conditions for subjunctives and indicatives would be different.)

25This is quoted from an unpublished manuscript that I had received from Brian Leahy in personal communication, almost the same quote can be found also in his published (2011) paper on page 262.

26These assumptions are not as ad hoc as my introduction of them here suggests. The Competence assumption and the Reliability assumption, for example, also play a role in the calculation of scalar implicatures.
Consider the following example:

(266) If John had been there, the party would have been fun.

Given that the speaker does not use the indicative, what is primarily implicated here is that the speaker does not believe that it might be the case that John came to the party. In a formula: $\neg B_s \diamond P_j$.

Now, it is of course logically possible that the speaker does not believe the opposite either: $\neg B_s \neg \diamond P_j$, but assuming that the speaker is opiniated about this issue, which is what the assumption of Competence amounts to, the hearer may infer that the speaker does believe the opposite: $B_s \neg \diamond P_j$. The next step is to infer from this that in fact $\neg \diamond P_j$, which can only be done if the hearer relies on the speaker’s judgement — which is what the assumption of Reliability is supposed to enforce. Finally, from $\neg \diamond P_j$ it logically follows that $\neg P_j$: John didn’t attend the party.

I omitted one complication: it could be that the reason why the speaker does not assert the indicative conditional is because s/he thinks the hearer might not be willing to accommodate its presupposition. To exclude this possibility, the hearer will have to assume that the speaker did not think so. This is the Authority assumption: the hearer assumes that the speaker believes s/he will be treated as an authority in this matter.

Note that this mechanism might help explain why in the arsenic example the speaker uses a counterfactual rather than an indicative conditional. The speaker knows that the hearer believes that the patient did not take arsenic. So, the speaker must reckon with the fact that the hearer will not be willing to consider him/her as an authority in the matter and accommodate the presupposition of the indicative ‘If he has taken arsenic, then these are the symptoms you get’. Therefore s/he says ‘if he had taken arsenic, . . . ’.

The hearer, in turn, cannot infer from this counterfactual that the speaker wants to implicate that the patient did not take arsenic. Assuming that speaker observes Maximize Presupposition, what the hearer can infer is “either the speaker does not believe that antecedent might be true or the speaker does not consider him/herself an authority in this matter”. And the hearer will certainly not think that the latter possibility can be excluded.

4.3 Testing for Falsity

Maybe this is a good point to take stock and see how counterfactuals fare with the diagnostic tests for implicatures and presuppositions we mentioned above.

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27 In a Kratzer-like semantics for epistemic possibility $\neg \diamond P_j$ comes out stronger than $\neg P_j$. But there are several theories of epistemic modality on the market that render $\neg \diamond P_j$ logically equivalent to $\neg P_j$. See for example Yalcin (2007).

28 Leahy gives a different explanation, claiming that in the arsenic example the implicature cannot be derived because the assumption of Competence fails. It is not clear from what he writes how exactly this would work.
Let’s start with a counterfactual conditional like (266) and see whether the inference that *John did not attend the party* passes the diagnostic tests for implicatures.

On Leahy’s account ‘John did not attend the party’ is a standard implicature of (266) and we saw above how this implicature is calculated. The fact that it can be calculated is in itself a strong indication that we are dealing with an implicature.

Now, if it is a standard implicature, it should be easy to cancel it, and it should also be possible to assert it explicitly without resulting in redundancy.

The following examples show that it is not very easy to do so.

(267) a. Cancellability
   ? ‘If John had been there, the party would have been fun, and in fact, John was there.

b. Re-inforceability
   ? If John had been there, the party would have been be fun. And John wasn’t there.

Of course, these examples at best suggest that the falsity inference is not cancelable or re-inforcable, they do not prove it. At best they challenge the reader to come up with better examples.

But then, does not the arsenic example show that the falsity inference is cancelable? No, it does not. Admittedly, in the arsenic case the speaker does not want to implicate that s/he believes that the antecedent is false. But that does not make it an example where s/he cancels the implicature (if it is an implicature) — not in the Gricean sense of the word, at least. No maxim is violated, so there is nothing to correct. Nothing is said or done to prevent the implicature from arising. The implicature just does not arise. To be sure, the speaker does not violate *Maximize Presupposition*. S/he does make her/his contribution presuppose as much as possible.

One might want to claim that the following examples show that the falsity inference is re-inforcable.

(268) a. If John had been there, the party would have been fun. But he wasn’t there, unfortunately.

b. If John had been there, the party would have been be fun. But he wasn’t there. So I left early.

The question is of course if these are genuine cases of re-enforcement. In the first example the speaker does not just state the inferred proposition, s/he needs to explicitly do so because s/he wants to express her/his attitude towards it. And in the second example s/he needs it because s/he wants to explain why s/he left early. Note, further, that ‘but’ is used. A simple ‘and’ would have been infelicitous here and this is an indication of the fact that the inference is not simply re-inforcable. ‘But’ indicates contrast; it indicates that the proposition under its scope is contra to expectation (see, among others, Umbach 2005).
As the next examples show, the same moves are possible in the case of entailments. Genuine cases of re-enforcement make a difference between entailments and implicatures.

(269) a. Not all students passed. Unfortunately, some didn’t.
    b. Not all students passed. Because some failed, the party was cancelled.

Presuppositions have characteristic properties too. As we saw in section 4.1 they project over a number of syntactic constructions. So, let’s see if the falsity inference that comes with (266) also comes when this sentence occurs in more complex environments. Imagine you saw John at the party, and try to think of a situation in which you would nevertheless assert any of the following.

(270) a. Perhaps if John had been there, the party would have been fun.
    b. It is not true that if John had been there, the party would have been fun.
    c. Is it true that if John had been there, the party would have been fun?

The fact that it is very difficult – if not impossible – to think of such situations may count as evidence that the falsity inference — whether it is a presupposition or an implicature — projects over negation, in questions, and over modal operators.

The only cases I can think of in which a speaker who has seen with his or her own eyes that John was at the party might nevertheless assert a sentence like (270b) are cases in which the addressee does not agree that John was there. Just like in the arsenic case, the speaker may in such cases — maybe just for the sake of argument — take the hearer’s perspective.

(271) S: Did you see John at the party? He looked so stressed.

H: No, I didn’t see him. I saw his ex, but not him. Actually, I don’t believe he was there. If he had been there, the party would have been fun.

S: Well, How can you say that? You know how John hates his ex. So at least you have to admit that it is not the case that if he had been there, it would have been fun.

More on this in the next section.

The fact that the falsity inference exhibits the projection properties of presuppositions is in itself no proof that it is a presupposition. Most implicatures lack these projection properties, but maybe in this special case the implicature
4.3. Testing for Falsity

does project. Actually, Leahy’s analysis predicts that they do.\textsuperscript{29} Implicated presuppositions will have the same projection properties as the presuppositions of which they are the anti-presuppositions. Consider for example the case of negation (270b). According to Leahy this sentence has the same truth conditions as the corresponding indicative (272), but it lacks its presupposition.

\begin{equation}
\text{(272)} \quad \text{It is not the case that if John was there, the party was fun.}
\end{equation}

The positive indicative conditional ‘If John was there, the party was fun’ presupposes that the antecedent is epistemically possible: it might be that John was there. Now, assume that the presupposition that the antecedent is epistemically possible projects over the negation in the indicative conditional, and that the negation of the counterfactual has no presupposition (just like in the positive case). Then, just like in the case of the positive sentence, the assumption that the speaker did not violate \textit{Maximize Presupposition} leads to the inference that the speaker uttered (270b) rather than the corresponding indicative because s/he does not believe that the antecedent might be true, and via the authority assumption this leads to the falsity inference.

The same kind of explanation will work in other cases of projection: as long as the indicative counterpart has a certain projection property, it will be inherited by the counterfactual.

\cite{Sauerland2008} claims that implicated presuppositions do not project over the universal quantifier. But note that the falsity inference does:

\begin{equation}
\text{(273)} \quad \begin{array}{l}
\text{a. If John had taken the exam, he would have passed.} \\
\text{b. For every boy it holds that if he had taken the exam, he would have passed.}
\end{array}
\end{equation}

There are more tests: as we saw earlier, presuppositions cannot be directly targeted in discourse. One has to say something like “Hey wait a minute” to get to the point. As the following example shows this also applies to the falsity inference.

\begin{equation}
\text{(274)} \quad \begin{array}{l}
\text{A: If John had been there, the party would have been fun.} \\
\text{B: \# No! John was there.} \\
\text{B: No! It would have been just as boring.} \\
\text{B: Hey, wait a minute! John \textit{was} there! I saw him.}
\end{array}
\end{equation}

Taking the falsity inference as an implicature, and more specifically as an implicated presupposition, gets you a long way. Taking it as a ‘real’ presupposition does so, too. Actually in the latter case the only obstacle are these poisonous arsenic examples. Can we maintain that the falsity inference is a presupposition, and find a way to deal with these examples nonetheless?

\textsuperscript{29}Leahy himself seems not to be aware of this.
4.4 A More Dynamic View

So far we have looked at the problem from a static perspective. Now it is time to see how far we can get in a dynamic framework.

Recall the dynamic definition of presupposition:

**Presupposition in a dynamic approach:** The sentence $\varphi$ presupposes the sentence $\psi$ iff for all information states $s$, $s[\varphi]$ is defined only if $s \vDash \psi$.

For the falsity inference to be a presupposition in this sense of the word, this amounts to claiming that for any state $s$, $s[\text{If it had been the case that } \varphi, \text{ then it would have been the case that } \psi]$ is defined only if $s \vDash \neg \varphi$.

Now, whose state $s$ are we talking about here? We already indicated that in the dynamic framework it is the state of the interpreter that matters, and in most cases this will be the addressee.

Consider the arsenic example once more. The speaker believes the antecedent is true, the hearer believes it is false. Notice the difference between (275a) and (275b).

(275) a. I believe that he took Arsenic. You believe that he didn’t. But at least you should admit that if he had taken Arsenic, he would have shown exactly those symptoms.

b. # I believe that he took Arsenic. But if he had taken Arsenic, he would have shown exactly those symptoms.

(275a) sounds fine, as opposed to (275b). What happens in (275a) is that the speaker purposefully uses the conditional that is licensed by the hearer’s state — in an attempt to change that state into one that looks more like the speaker’s own state. In (275b) the speaker refers to his/her own state.

What is important here is that the arsenic case is a special case: a case in which speaker and hearer disagree. We are not dealing with information exchange, where the interlocutors just update each other’s states, adding proposition to proposition. When there is no disagreement, speaker and hearer will share the same presuppositions, and there is room for accommodation when a presupposition is not yet shared. But when there is a disagreement, and this disagreement concerns a presupposition, then there is a problem. Of course the speaker can always simply speak his mind. However, sometimes it is more helpful to take the hearer’s perspective in an attempt to make him change his mind before abandoning cooperative efforts.\(^\text{30}\)

This phenomenon is not restricted to counterfactuals. It is attested in indicatives as well. If you think indicative conditionals presuppose that their

\(^{30}\)It has been suggested by Paul Portner that this phenomenon can be explained in a static framework by the notion of a context split. In a dynamic framework we always have two states, the state of the hearer and the state of the addressee. These states may have much in common, but it is not the common ground that is updated.
antecedent may be true, which many semanticists do, then at first sight the following are counterexamples.

(276)  


b. Martin has solved Fermat’s Puzzle! If that is so, then I’m Gödel’s uncle! von Fintel (1998:15, fn9)

But if you realize that – from a dynamic perspective at least — what matters is not so much the speaker’s state but the hearer’s, there is no problem. The hearer thinks the antecedent is possible. The speaker disagrees, but by asserting (276a) or (276b), he is taking the hearer’s perspective, at least for a very short time, if only to arrive at a *reductio ad absurdum*.

This shift of perspective to the hearer’s state also occurs in other environments. Take for instance the following example in which a teacher speaks to a student, testing her in Maths.

(277) Correct. 3 times 11 equals 33. Now here’s a difficult one: 7 times 13.

Clearly, the exercise is not difficult for the teacher; but it is difficult given what the student knows. What happens here with ‘difficult’ can happen with many gradable adjectives, in particular predicates of personal taste, or with epistemic modalities — in fact with all phenomena that in a static approach are often taken to be assessment sensitive.

Stalnaker writes this about the arsenic example:

“it cannot be counterfactual, since it would be self defeating to presuppose false what one is trying to show true” (Stalnaker 1975).

Nevertheless, I have attempted to argue that no self defeat is involved here. The speaker wants to change the hearer’s information state, and starts doing so by choosing a conditional that is licensed by the hearer’s information state. Without this, the hearer might have not been willing to listen. But then, the speaker brings in information which is in fact available to both the speaker and hearer – the symptoms of the patient that they both can see – in an attempt to draw the hearer’s attention to the causal relation between the antecedent and the consequent.

In order to be able to explain these special counterfactual examples as well as the regular counterfactual examples in a unified account without alluding to exceptions all we have to do is consider the idea that the state which licenses the counterfactual is always a state that supports ¬ϕ. This can be the speaker’s state, but normally what matter’s is the state of the hearer.

32See the writings of John MacFarlane, for instance (2005) et seq.
4.5 Single Marking versus Double Marking

4.5.1 The Role of Expectations

So far I have restricted the discussion to what I have called doubly marked CF conditionals. But I should also explain how singly marked CF conditionals fit in. How exactly does the assumption made in the antecedent of (278b) differ from those made in the antecedents of (278a) and (278c)?

(278)  a. Maybe John will come to the party tonight. If he comes, it will be fun.
    b. I don’t know whether John will come to the party, but if he came, we would have a great time.
    c. John will not come to the party tonight, he just told me. Too bad. If he had come, he might have enjoyed himself.

Iatridou (2000:253) notes that examples like (278b) can be asserted by someone who is agnostic, that is who believes neither that the antecedent is false nor that it is true, and she adds in a note that some people have the intuition that the easiest obtainable meaning of this kind of conditional involves unlikelihood of the antecedent.

Iatridou was not the first to note this. She quotes Lewis (1973) who wrote

“There are subjunctive conditionals pertaining to the future, like ‘If our ground troops entered Laos next year, there would be trouble’ that appear to have the truth conditions of indicative conditionals, rather than of the counterfactual conditionals I will be considering.”

Lewis (1973:4)

In a similar vein, Comrie (1986) discusses the following dialogue.

(279)  A: Will you buy me a beer?
    B: If you gave me a kiss, I’d buy you a beer.

And he writes:

“B could, of course, also have said ‘If you give me a kiss, I’ll buy you a beer’ but what is crucial is the possibility of the version cited in the dialogue. (The version in the dialogue is more hypothetical than its alternative, i.e. suggests a lower probability of A’s kissing B, which in the given circumstances might be used by B to avoid too negative an aspersion on A’s morals.)

Comrie (1986:89)

That the antecedent is considered less likely to be true in a singly marked conditional than in the corresponding indicative, is also illustrated by the next dialogue.
4.5. Single Marking versus Double Marking

(280) Journalist: ‘Sir, what are you going to do if you lose the election?’
Candidate: ‘I expect to win.’
Journalist: ‘I see, sir, but what if you were to lose?’

To deal with the examples cited above, we need a three way distinction. We can get there by making a difference between the expectations and the knowledge of the speakers.\textsuperscript{33}

\textbf{Definition} A \textit{state} \( s \) is a triple \( \langle W, K, E \rangle \), where

\begin{enumerate}[(i)]
    \item \( W \) is a nonempty set of worlds.
    \item \( K \) and \( E \) are nonempty subsets of \( W \) such that \( \emptyset \neq E \subseteq K \).
\end{enumerate}

What we are modelling here is the information state \( s \) of one speaker, and what matters is the knowledge and the expectations of this speaker about some future state of the world. Think of \( W \) as the set of logical possibilities the speaker has to take into account. One of these possibilities will become real. The question is which one. Given what the speaker knows,\textsuperscript{34} it is one of the elements in \( K \). But among the possibilities in \( K \) some are more likely to be the real one than the other. These are the elements of \( E \); they represent those possibilities that meet the speaker’s expectations. The speaker knows \( \varphi \) iff \( \varphi \) is true in all worlds in \( K \); the speaker expects \( \varphi \) iff \( \varphi \) is true in all worlds in \( E \). Given that \( E \subseteq K \), the speaker expects every \( \varphi \) s/he knows.

In the previous section we concluded that within a dynamic semantic framework the presuppositional behaviour of conditionals is best described as follows:

- An indicative conditional \textit{if it is the case that} \( \varphi \) \textit{, then it will be the case that} \( \psi \) presupposes \textit{it might be the case that} \( \varphi \) — in other words \( s[\text{if it is the case that } \varphi , \text{ then it will be the case that } \psi ] \) is defined only if \( K \cap \llbracket \varphi \rrbracket \neq \emptyset \).

- A doubly marked conditional \textit{If it had been the case that} \( \varphi \) \textit{, then it would have been the case that} \( \psi \) presupposes \textit{it’s not the case that} \( \varphi \) — in other words, \( s[\text{if it had been the case that } \varphi , \text{ then it would have been the case that } \psi ] \) is defined only if \( K \cap \llbracket \varphi \rrbracket = \emptyset \).

Now, we have to make room for the singly marked conditional. We can do so as follows:

- A singly marked conditional \textit{If it were the case that} \( \varphi \) \textit{, then it would be the case that} \( \psi \) presupposes \textit{it’s unlikely that} \( \varphi \) — in other words, \( s[\text{if it were the case that } \varphi , \text{ then it would be the case that } \psi ] \) is defined only if \( E \cap \llbracket \varphi \rrbracket = \emptyset \).

\textsuperscript{33}This strategy of alluding to expectations and beliefs is also suggested in Schulz (2012).
\textsuperscript{34}Or rather, given what the speaker believes to know. See Veltman (1996) and Portner (2009).
Figure 4.1: Indicative (non-CF Marked) Conditional

Figure 4.2: Singly Marked CF Conditional
Given these stipulations, a singly marked conditional cannot be properly used when the antecedent is likely. In such a case one has to use the indicative (cf. 281a). On the other hand, it is allowed to use an indicative conditional when the antecedent is consistent with what is known but not with what is expected (cf. 281b). And one can also use a singly marked conditional when it is known that the antecedent is false (cf. 281c).

(281)  

a. # John may very well come to the party, and if he came, we would have a great time.

b. It’s unlikely that John will come to the party, but if he comes, we will have a great time.\footnote{Stressing ‘if’ makes it sound even better.}

c. I know that he’s not coming back. If he were coming back, Mommy wouldn’t be crying.

The above does not in itself explain the observation we made in connection with (279) and (280). How come that in these examples and in many other cases the use of an indicative suggests that the antecedent is not unlikely? Here we need to appeal to pragmatics. The singly marked conditional presupposes that the antecedent is unlikely. The indicative does not. So when you use the indicative in a context in which the antecedent is unlikely, you have to explicitly mention this. Given this, when you use the indicative without explicitly saying that the antecedent is unlikely, the addressee will infer not just that according to you the antecedent might be true, but that it may very well be true. In short: even though the indicative does not presuppose that the antecedent is not unlikely, it does at least implicate this.
In a similar way we can explain why the typical context for using a singly marked conditional is one in which the antecedent is unlikely, but not known to be false. The doubly marked conditional presupposes that the antecedent is false, the singly marked only presupposes that the antecedent is unlikely. Given this, when you use a singly marked conditional rather than a doubly marked conditional in a context in which the antecedent is false, you have to explicitly say so — if at least this is not known by the addressee. Otherwise, the addressee will think it is just unlikely.

One wonders how Leahy or other proponents of a pragmatic theory of presupposition would extend their account to incorporate singly marked conditionals. This will not be straightforward. One cannot make both the falsity inference of doubly marked conditionals and the unlikelihood inference of singly marked conditionals anti-presuppositions of one and the same indicative presupposition.

In the above I have restricted myself to singly marked conditionals with antecedents pertaining to possible future events. But people not only have expectations about the future, they also have expectations about the present and the past. What do they say to express that in the unlikely case that $\varphi$ is/was true, $\psi$ is/was true? Can they use singly marked conditionals in these cases, too?

Here, things get tricky. Iatridou (2000:253 (69a)) provides (282a) as an example showing that one can use a singly marked conditional also in cases in which the antecedent refers to the present. One wonders, however, if it would not be appropriate to use a plain indicative here. The same can be said about (282b) and (282c).

(282)  
  a. I don’t know if he’s rich, but if he were rich, he would be popular with that crowd.  
  b. Obama a Muslim? Even if he were, so what?  
  c. I don’t know what he does for a living. But even if he were a carpenter, I would marry him.

The fact is that the examples above sound better if you use the plain indicative. The fact is also that singly marked conditionals pertaining to the present are often used in contexts in which the antecedent is not just unlikely, but plainly false.

(283)  
  a. If I were a carpenter, would you marry me anyway?  
  b. If I were you, I would leave him. (Schulz 2007:89 (45b))

Can one use a singly marked conditional to convey that the antecedent refers to an unlikely past event? Here, things are even less clear. It looks like

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36 We use epistemic modal markers to express these, saying things like ‘That’ll be the milkman’, ‘John must be ill’, ‘Presumably, Peter did it’.

37 Many variants of this can be found on the internet.
singly marked conditionals pertaining to the past either come with the falsity inference (consider (284a)) or express something that is better expressed by an indicative (consider (284b)).

(284) a. (?) I don’t know who killed Mary, but it’s unlikely it was John. If he killed her, he would have used an axe.

b. (?) I don’t know who killed Mary, but it’s unlikely it was John. If he were to have done it, what would have been his motive?

It will be clear that what we said about singly marked conditionals with antecedents that pertain to the future, can only be extended to singly marked conditionals pertaining to the present and the past if the singly marked conditionals in the examples given in (282) and (284) leave the possibility open that the antecedent is true. Given that native English speakers disagree here, it seems wise to postpone a conclusion until more and clearer empirical data have been collected.

4.5.2 English versus Dutch and Palestinian

Let’s now turn to Dutch. Just like in English, singly marked conditionals referring to the future in Dutch presuppose unlikelihood rather than falsity of the antecedent, as in (285).

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Special thanks to Cleo Condoravdi for sharing her insights and doubts about this issue with me via long correspondences and many more intriguing examples that unfortunately I could not discuss at length here. Regarding the example in (284b), Condoravdi notes that it is also possible to reason along the following line in which case unlikelyhood would not be necessarily implied. For instance, (1).

(1) Yesterday John was killed. We have no idea who did it and why. Anyone could have done it. If Bill were to have done it, it would have been because of their long-standing dispute. If Ed were to have done it, it would have been because of ... If Steve were to have done it, it would have been because of ... Cleo Condoravdi (p.c.)

Another interesting example of CF morphology used by someone who is agnostic without necessarily implicating unlikelihood is the following in (2).

(2) If dinosaurs have lived in this area, they would have made their nests in these caves (so let’s see if we can find any evidence in the caves). Cleo Condoravdi (p.c.)

For Condoravdi this “would have” seems to be the past version of epistemic “will”/“will have”, as in (3) and (4).

(3) If John left work early, he will be at home now.

(4) If John arrived yesterday, he will have talked to Bill already.

It is no coincidence then that such examples are better expressed by an indicative as we mention.
Counterfactuality of Antecedent, Real or Fake?

(285) Als ze me een baan aanboden, zou ik meteen ja zeggen. 'If they offered me a job, I would accept it right away.'

And just like in English, it is a lot easier to find (or construct) singly marked conditionals in which the antecedent refers to a possible (but unlikely) event in the future than examples in which the antecedent refers to a possible (but unlikely) event in the present or in the past. Perhaps this is so because speakers of Dutch have other constructions available allowing them to express that in the unlikely case that $\varphi$ is/was true, $\psi$ is/was true. In such a case the modal auxiliary mocht is often employed. An example is given in (286).

(286) Het lijkt me sterk dat hij wel eens in China is geweest. Maar als hij er ooit geweest mocht zijn, dan is het vrij snel weer teruggekomen. 'I doubt he has ever been in China. But if he ever “might” have been there, he must have come back very quickly.'

Note that you cannot use mocht when the antecedent is inconsistent with what you know, as is illustrated by (287).

(287) *Als ik jou mocht zijn, dan zou ik bij hem weggaan. 'If I were to go away.'

In Palestinian the situation is clearer, as Palestinian provides the slots into which tense and aspect morphemes can occur to express the real tense and aspect of the situation in addition to stacking strategies that allow the NAV morphology to yield counterfactuality. This means that Palestinian has no problem expressing unlikelihood of a present situation. This is because in Palestinian one can use the special-if law, or the default if $iza$ with one NAV morpheme which is not interpreted temporally. This is illustrated in (288).

(288) ma ba3raf iza b-ihib is-samak, bas iza kan-no NEG know if $b$-love.3SM the-fish, but if be.PST.3SM-SUBJINC b-ihibb-o, b-ikuun mkayyef bi-qaryet is-sayyadeen. b-love.3SM-it.M, b-be.IMPFV.3SM overjoyed in-village the-fishermen ‘I don’t know if he likes fish, but if he does, he’s delighted at the fishermen’s village!’

39Note that in English too, there is a special construction that expresses something similar to the Dutch ‘mocht’ construction to be introduced next and that is the ‘should’ construction as in ‘If I should fall behind, wait for me.’
40Note that unlike the singly marked conditional, the mocht construction has indicative morphology in the consequent.
Similarly, Palestinian has no problem expressing unlikelihood of a past situation as one can use the special-if law and the NAV morpheme kaan, or the default if iza with two NAV morphemes, one saturating the temporal interpretation and the other interpreted modally, as exemplified in (289).

(289) b-astab{b}ed inno ykuun daa?  
b-find.far.IMPFV.1SG SUBJINC be.IMPFV.3SM taste.PST.PFV.3SM  
il-herring, bas iza kan-no daa{-}o, kaan  
the-herring, but if PST-SUBJINC.3SM taste.PST.PFV.3SM-it.M, PST  
?akiid ma ‘aad-ha!  
sure NEG repeat.PST.PFV.3SM-it.F  
‘I doubt that he ever tried herring. But if he did, I’m sure he never did it again.’

Note that the English paraphrases of (288) and (289) are in the indicative.

So what we said about the future in English and Dutch, we can also say about the past and present in Palestinian without a problem – namely Palestinian has no problem expressing the unlikelihood of the antecedent whether it refers to the past, present or future.

We have in the above restricted ourselves to a discussion of the presuppositions and implicatures of various kinds of conditionals. Let me now indicate how this can be extended to a full semantics. In a dynamic framework this amounts to giving a recipe describing how a hearer should incorporate the new information in his or her information state. Informally, the recipes for the various kinds of conditionals are the following.

A conditional with (non CF) morphology presupposes that the antecedent is consistent with everything one knows and invites the hearer to test whether the proposition conveyed by the consequent follows in case the antecedent is true. To perform the test, the hearer updates his or her information state with the antecedent, and checks whether the result supports the consequent.

The above leaves two cases: (a) the antecedent is consistent with everything one knows but not consistent with ones expectations. As we saw above in that case one should explicitly say so (to cancel the implicature that the antecedent is not unlikely) or use a singly marked CF instead. (b) the antecedent is consistent with everything one expects. In that case the consequent will often have form it will be the case that \( \chi \), expressing that one expects \( \chi \) to be true.

Double CF marking presupposes that the antecedent is inconsistent with everything one knows, and invites the hearer to test whether the proposition conveyed by the consequent follows had the antecedent been true. To perform the test, the hearer “substracts” the negation of the antecedent from his or her information state, updates the resulting state with the antecedent and checks whether the result supports the consequent.

To see how exactly this substraction operation works the reader can best consult the literature on Premise Semantics for counterfactuals. There are several

\[41\] This is the semantics for indicatives proposed in Gillies 2004.
variants on the market, and it is still a matter of debate which is best (see Veltman 2005, Schulz 2007, Kratzer 2012.)

Single CF marking presupposes that the antecedent is inconsistent with ones expectations, and invites the hearer to test whether the proposition conveyed by the consequent follows in case the antecedent were true.

If this presupposition is satisfied there are two cases. (a) The antecedent is unlikely but consistent with everything one knows. In this case the hearer updates his or her information state with the antecedent, and checks whether the result supports the consequent. (b) The antecedent is inconsistent with everything one knows. In this case the hearer “substracts” the negation of the antecedent from his or her information state, updates the resulting state with the antecedent and checks whether the the result supports the consequent.\footnote{Note that the operation under (b) also works for (a). If the antecedent is consistent with everything one knows then substracting its negation will not make any difference, because there is nothing to substract.}

We wish we could say that (a) is the normal case, and (b) the exception, but as we saw above this holds only for languages like Palestinian Arabic. For Dutch and English and probably many other languages there are too many exceptions to be explained away.

\subsection{Conclusions}

In this chapter, we have been concerned with the falsity inference of counterfactual conditionals. We attempted to answer how this inference comes about from a morpho-syntactic perspective as well as from a semantic-pragmatic one.

We reviewed different accounts that attempted to answer these questions. The formal accounts presented in this chapter look for a unified account of the nature of falsity and argue that the falsity inference is of one type across the board. Nevins (2002) would dispute this. As we also saw in previous chapters, he suggests that languages are split such that there are languages in which falsity is a presupposition across the board (languages that use dedicated CF markers), while in others falsity is an implicature across the board (languages that use temporal/spatial morphemes). I have attempted to show that in all the languages we have looked at, there is evidence for two types of counterfactuals: a strong one, which comes with the presupposition that the antecedent is false, and a weaker one, which comes with the presupposition that the antecedent is unlikely. Evidence shows that the stronger counterfactuals include some sort of extra grammatical marking: a dedicated CF or irrealis morpheme (cf. Zulu), an extra NAV morpheme in addition to the choice of a marked aspect (cf. Arabic), the choice of a marked mood (cf. Italian), wide scope (cf. Turkish\footnote{See Ippolito 2004.}), or movement (cf. English) – hence our terminology ‘doubly marked CF conditionals.’
I have taken a semantic approach. Nevertheless, I am aware of the fact that there is one advantage to pragmatic accounts and that is that pragmatic accounts seek to explain how the presupposition comes about whereas in the semantic account this is a mere stipulation. Those accounts which really want to calculate the implicature actually arrive at the conclusion that it is an implicated presupposition. As such their starting point is to consider indicative and counterfactual conditionals to be members of a set of lexical alternatives. We have seen, however, that such accounts fail to deal with the third type, namely ‘singly marked CF conditionals’. Note that taking the indicative and counterfactual to be lexical alternatives is only possible if one assumes a bi-partition of conditionals: it is impossible to make the falsity inference of doubly marked conditionals and the unlikelihood inference of singly marked conditionals anti-presuppositions of one and the same indicative presupposition.

When we ran the hallmark diagnostic tests for presupposition status in section §4.3, we were inclined to conclude that the falsity inference must be a presupposition because it passed all the tests. There remained only one obstacle in the face of a non-hesitant conclusion that this inference is indeed a presupposition and this was the arsenic type of examples.

However, when we took a dynamic turn we were able to maintain that falsity is a presupposition and at the same time account for these special examples. All we had to do was reckon with the fact that the state that matters is the state that is updated. In dynamic semantics, this state does not represent the information shared by the discourse participants, but the information state that is being updated, which usually is the state of the addressee. Note that this is in contrast with the notion of common ground.

Within the dynamic view that we have adopted in this chapter, we argued that it is instructive to consider the fact that when there is disagreement between the speakers, it is more helpful to take the hearer’s perspective (the hearers information state) in an attempt to make her change her mind before abandoning cooperative efforts and withdrawing to the speaker’s own state or from the conversation all together. We have exemplified that this phenomenon is not restricted to conditionals and can be found elsewhere.

In section §4.5, I have presented a sketch of a theory that would account for the three types of conditionals: indicatives, singly marked CFs and doubly marked CFs by alluding to information states that express relations between propositions’ compatibility with knowledge and expectations. According to this sketch, an indicative conditional presupposes that $K \cap \llbracket \varphi \rrbracket \neq \emptyset$; that is to say $\varphi$ is consistent with the knowledge. A singly marked CF conditional presupposes that $E \cap \llbracket \varphi \rrbracket = \emptyset$; that is to say that $\varphi$ is not consistent with the expectations. And a doubly marked CF conditional expresses that $K \cap \llbracket \varphi \rrbracket = \emptyset$; that is to say $\varphi$ is not consistent with the knowledge. This means that it takes two steps to get from an indicative to a counterfactual (in the strong sense). The first brings you to situations that are unlikely, the second to situations that are excluded. This dissertation has shown that morpho-syntactically this is reflected by the number of what we have called NAV-morphemes, in chapters 2 and 3. As we
saw, the stacking of NAV morphemes gets you to a stronger falsity inference, but so do other morpho-syntactic operations. We have also seen, however, that the ideal picture can be, and often is, blurred by the interplay between morpho-syntax and pragmatics and we have introduced a couple of complications and conjectures in this regard in §4.5.1 and 4.5.2.\textsuperscript{44}

Nevertheless, from the crosslinguistic picture presented, the conclusion that follows is that regardless of whether languages employ special counterfactual morphemes or NAV morphemes, they find a way to distinguish between those CF conditionals that pertain only to $E \cap \llbracket \varphi \rrbracket = \emptyset$ and come along with a weak falsity inference from those that pertain to $K \cap \llbracket \varphi \rrbracket = \emptyset$ and come along with a strong falsity inference. As we have seen, these tools can be morphological or syntactic, depending on the language. Further, it is up to the dialogical situation to facilitate the choice as to which form is used. Sometimes, this goes hand in hand with a trade off at the expense of transparency especially when the real tense factor comes into play and one has less morpho-syntactic tools at one’s disposal.

\textsuperscript{44}See also §5.4 in the next chapter for a bit more on this point.