

ON THE ACCESSIBILITY OF POSSIBLE WORLDS:
THE ROLE OF TENSE AND ASPECT

A Dissertation presented

by

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ABSTRACT

This dissertation deals with the interpretation of tense and aspect morphology in *would*-conditionals. These are conditionals headed by the modal *would*. *Would*-conditionals have been widely discussed in the philosophical literature, usually in the context of counterfactual reasoning. In this dissertation I propose a linguistic analysis that seeks to derive properties of *would*-conditionals from the compositional interpretation of tense and aspect morphology. I argue that tense and aspect affect the nature of the worlds accessible to the modal for quantification.

In *Chapter 1* I present an introduction to the main problems, and discuss some aspects of the theoretical framework that I will be adopting.

In *Chapter 2* I present an analysis of the interpretation of past tense morphology in *would*-conditionals. In dealing with *would*-conditionals, we are usually interested in worlds that are very similar the actual world up to the time corresponding to the event described by the antecedent clause. I propose to account for this by analyzing *would*-conditionals as *de re* claims about the past. I characterize the semantics of the modal *would* in terms of quantification over worlds that contain counterparts of the actual-world past.

In *Chapter 3* I present an analysis of ‘backtracking’ conditionals. These are *would*-conditionals that manage to quantify over worlds that differ from the actual world at some time before the antecedent clause event. I claim that this is because in backtracking counterfactuals there is an extra layer of auxiliaries that gives particular relevance to laws.

In *Chapter 4* I present an analysis of the difference between *would*-conditionals with simple past tense morphology in the antecedent clause and *would*-conditionals with past perfect morphology in the antecedent clause. Some simple *would*-conditionals appear not to allow for a counterfactual interpretation, and this militates against a unified analysis of *would*. However, I show that a unified analysis can be maintained, and the differences explained in terms of the interpretation of tense and aspect morphology. The crucial piece of my analysis will be a characterization of perfective aspect as a deictic aspectual head.

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Chapter 1

INTRODUCTION

1.1 Setting the stage

This dissertation is about the interpretation of *would*-conditionals. At least, about some aspects of the interpretation of *would*-conditionals. *Might*-conditionals will be invoked from time to time, but they will not be discussed separately.

Would-conditionals are conditional sentences headed by the modal *would*. They have been the subject of much debate by philosophers and linguists. In this dissertation I will be concerned with explaining how the choice of tense and aspect morphology affects their interpretation.

The most influential analysis of *would*-conditionals is to be found in the work of David Lewis and Robert Stalnaker. Though there are important differences amongst their proposals (and some will be discussed below), there are enough similarities to allow us to talk about a Lewis-Stalnaker analysis. The intuition underlying their analysis is to be found at the very beginning of Lewis's book *Counterfactuals*:

(1) *"If kangaroos had no tails, they would topple over" seems to me to mean something like this: in any possible state of affairs in which kangaroos have no tails, and which resembles our actual state of affairs as much as kangaroos having no tails permits it to, the kangaroos topple over."*
(Lewis 1973: 1)

According to the intuition reported by Lewis, the interpretation of *would*-conditionals requires that we consider what happens in states of affairs that differ from the actual one. If we conceive states of affairs as possible worlds, the semantics of *would*-conditionals requires that we find out what happens in other possible worlds.

There are many possible worlds. The truth value of a *would*-conditional crucially depends on how we figure out which possible worlds are relevant to the interpretation of

the conditional. In this dissertation I argue that tense and aspect play an important role in identifying the relevant worlds.

Below I present some examples of types of *would*-conditionals that will be discussed in later chapters:

(2) a. If Nixon had pushed the button, there would have been a nuclear holocaust.
b. If John had asked Jack for help yesterday, there would have to have been no quarrel the day before.
c. If your plants died next week, I would be very upset.

The conditionals in (2) have slightly different flavors. In (2a) we have a classic ‘counterfactual’ conditional. In (2b) we have a morphologically more complex counterfactual, that Lewis calls a ‘backtracking’ counterfactual. In (2c) we have a *would*-conditional that does not appear to be counterfactual at all.

Variation in the interpretations of *would*-conditionals have been considered problematic for a unified analysis (Lewis himself was skeptical about the possibility of a unified analysis). However, I argue that it is possible to have a unified analysis for *would* and derive the differences we observe in (2) from properties of the interpretation of tense and aspect.

Following Lewis and Stalnaker, I take as a starting point an analysis of the modal *would* in terms of quantification over possible worlds. I then show that we can explain the variation we observe in examples like (2) in terms of restrictions on the domain of quantification of the modal. If we think of the quantificational domain of the modal as the set of worlds *accessible* to the modal, we can think of the variation in (2) as responding to differences in the set of accessible worlds. The central thesis of this dissertation is that semantic properties of tense and aspect affect the accessibility of possible worlds.

The structure of the dissertation is as follows:

In *Chapter 2* I present an analysis of the interpretation of past tense morphology in *would*-conditionals. In dealing with *would*-conditionals, we are usually interested in worlds that are very similar the actual world up to the time corresponding to the event

described by the antecedent clause. I propose to account for this by analyzing *would*-conditionals as *de re* claims about the past. I characterize the semantics of the modal *would* in terms of quantification over worlds that contain counterparts of the actual-world past.

In *Chapter 3* I present an analysis of ‘backtracking’ conditionals. These are *would*-conditionals that manage to quantify over worlds that differ from the actual world at some time before the antecedent clause event. I claim that this is because in backtracking counterfactuals there is an extra layer of auxiliaries that gives particular relevance to laws.

In *Chapter 4* I present an analysis of the difference between *would*-conditionals with simple past tense morphology in the antecedent clause and *would*-conditionals with past perfect morphology in the antecedent clause. Some simple *would*-conditionals appear not to allow for a counterfactual interpretation, and this militates against a unified analysis of *would*. However, I show that a unified analysis can be maintained, and the differences explained in terms of the interpretation of tense and aspect morphology. The crucial piece of my analysis will be a characterization of perfective aspect as a deictic aspectual head.

In what remains of this chapter I will present some background material that will be relevant throughout the remaining chapters. I will begin by illustrating some of the peculiarities of the interpretation of tense and aspect morphology in *would*-conditionals. An important assumption, that will be upheld throughout this work, is that what looks like tense and aspect morphology in *would*-conditionals really is tense and aspect morphology. In §1.2 I will make reference to some grammars of English that favor this view. I will then very briefly note some aspects of the Lewis-Stalnaker analysis of conditionals. In §1.3 I will present an overview of some similarities and differences in their proposals. I will then say something about what it takes to adopt their ideas within a linguistic framework for natural language semantics. Part of my objective in this section is to make clear where I will follow Lewis and Stalnaker and where I will simplify, and slightly depart from their ideas. I also want to be clear about linguistic issues that have been set aside and will not be dealt with. Finally, I will turn to the semantics of tense and

aspect. In §1.4 I will spell out some of my basic assumptions. These issues will be further developed in later chapters.

1.2 The tense and aspect issue

Would-conditionals are part of a category of conditionals that *The Cambridge Grammar of the English Language* (2002) calls ‘remote’. The classification of conditionals as remote is based on intuitions regarding the nature of the condition expressed by the antecedent clause, and on the interpretation of tense and aspect morphology. *The Cambridge Grammar of the English Language* offers us the following examples of remote conditionals:

(3) Remote conditionals

- a. If he was here, he would be upstairs.
- b. If you went tomorrow, you would see Ed

The intuition is that the condition expressed by remote conditionals is unlikely, and this can come about either because it is doubtful or false. The examples in (3) illustrate this point. We could utter (3a) in a context in which we knew he was not here, but wanted to make a hypothesis about what would have happened if he had been. We could utter (3b) to make a hypothesis about what would happen if you went tomorrow, however unlikely that might seem.

According to *The Cambridge Grammar of the English Language*, there is past tense morphology in (3), even though temporal reference is made to the speech time or to the future. Clearly, past morphology does not receive the standard past interpretation. This is one of the distinguishing features of remote conditionals. The authors of the grammar claim that in remote conditionals, tense expresses a modal rather than temporal meaning, and they refer to the meaning of past tense in conditionals like (3) as *modal remoteness*.

The *Oxford Companion to the English Language* makes a similar distinction between conditionals. Instead of the name *remote*, they use *hypothetical*:

(4) Conditions may be open or hypothetical. Open conditions are neutral: they leave open the question of the fulfillment of the condition. Hypothetical conditions imply that the fulfillment is doubtful or has not taken place. They have a past or past perfect in the conditional clause and a modal (usually *would*) in the past or past perfect in the main clause.

(*The Oxford Companion to the English Language*, 1992: 255)

A Comprehensive Grammar of the English Language also makes use of a similar classification, and elaborates on the interpretation of tense in the following manner:

(5) “The verbs in hypothetical conditional clauses are backshifted, the past tense form being used for present and future time reference and the past perfective form for past time reference. When these forms have such hypothetical implications we term them HYPOTHETICAL PAST and HYPOTHETICAL PAST PERFECTIVE.”

(*A Comprehensive Grammar of the English Language*, 1985: 1010)

The grammar provides the following examples (op cit 1092):

(6)

	conditional clause	matrix clause
present and future reference	PAST If I were younger,	PAST MODAL I would study Classical Greek
past reference	PAST PERFECTIVE If I had seen you,	PASTPERFECTIVE MODAL I would have invited you home

However, the *Comprehensive Grammar* is not exactly right. It is not the case that past perfect morphology in the antecedent clause refers to the past. The correct picture is that simple past morphology can refer to the present and future, and past perfect morphology

can refer to the past, present and future. This observation is found in Dudman (1984), who offers us the following table and examples (Dudman 1984: 150):

(7)

V-ed	future	If Grannie <u>missed</u> the last bus tomorrow, she <u>would</u> walk home.
	present	If Her Majesty <u>was</u> here now, she <u>would</u> be revolted.
had V-en	future	If Grannie <u>had missed</u> the last bus on Friday (next Friday), she <u>would</u> have walked home (<i>she is actually dead</i>).
	present	If Her Majesty <u>had been</u> here now, she <u>would</u> have been revolted.
	past	If Grannie <u>had missed</u> the last bus on Friday (last Friday), she <u>would</u> have walked home (<i>luckily, she caught it</i>).

As the examples show, *if*-clauses with simple past (V-ed) morphology can be interpreted as making a hypothesis about events going on at the speech time or at some future time. *If*-clauses with past perfect morphology (had V-en) can be interpreted as making a hypothesis about events going on in the past, at the speech time, or in the future. This last point is illustrated by the example *If Grannie had missed the last bus on Friday, she would have walked home*. We can interpret the sentence as making reference either to last Friday or next Friday. Suppose that Grannie has passed away, and we are discussing how independent and full of energy she used to be. We know that she had planned to take the bus next Friday, and we have no doubts as to what would have happened if she had missed it: if she had not managed to catch that bus, she would just have walked home. The example shows that past perfect morphology in the antecedent can be used to make a hypothesis about an event in the future. So, the table in (6) is not completely accurate: it needs to be modified to include the possibility that past perfect morphology make reference to the present and future (this point will become very important in Chapter 4). I hope that by inspecting the discussions found in grammars of English, the following points will have become clear: (1) there is something intuitively appealing about thinking that what looks like past tense morphology in *would*-conditionals simply is past tense

morphology, (2) the interpretation of tense and aspect morphology in this context is not standard, and (3) the particular interpretation of tense and aspect morphology is tied to semantic peculiarities found in *would*-conditionals. These points will be taken up in later chapters.

1.3 A Lewis-Stalnaker analysis with a linguistic twist

The proposal I will argue for relies crucially on the work of Lewis and Stalnaker. In this section we will briefly review some of their basic assumptions. In doing so, we will come across some of the problems I should deal with. We will also gain some idea about the issues I will set aside. The last section is dedicated to spelling out some of the specifically linguistic problems facing anyone who wants to talk about the interpretation of conditionals.

1.3.1 The ingredients

Both Stalnaker and Lewis concerned themselves with the interpretation of conditional statements.¹ They proposed interpreted logics for conditional connectives that are meant to elucidate the meaning of English sentences. Both authors present the interpretation of the conditional connective in the framework of possible world semantics, and they both follow the same basic intuition: a conditional statement with α as antecedent and β as consequent (Stalnaker: $\alpha > \beta$, Lewis: $\alpha \Box \rightarrow \beta$) will be true in a world w iff β is true in some (to be specified) set of worlds where α is true (in the non-vacuous case).

The proposals made by Stalnaker and Lewis differ in various respects. One important difference has to do with the class of English sentences that they consider has an interpretation matching the conditional operator. Stalnaker considers that the semantics of the $>$ operator corresponds to the semantics of English conditional statements in general. Lewis considers that the $\Box \rightarrow$ operator provides an appropriate account of English counterfactual conditionals, but not of other types of conditionals.

¹ Stalnaker (1968), Lewis (1973)

The classification of conditionals is in itself a complicated matter. I have chosen to simply talk about *would*-conditionals, easily identified by the fact that they are headed by the modal *would*. *Would*-conditionals are often called ‘subjunctive’ in the philosophical literature. My goal is to present a unified account of *would*-conditionals, including both the counterfactual variety and some more ‘indicative’-like versions.² In a sense, the position I have taken an intermediate position between Stalnaker and Lewis.

There are (at least) two kinds of examples that have been considered problematic for a unified account of *would*-conditionals: (a) *would*-conditionals with antecedents that are not false, and (b) *would*-conditionals that make hypothesis about the future. A successful unified account needs to explain both cases. I present examples below:

(a) In arguing for a distinction between the concepts of ‘subjunctive conditional’ and ‘counterfactual conditional’, Anderson (1951) came up with a type of example in which a subjunctive conditional, with the morphological form typically associated with a counterfactual conditional, is understood to have a true antecedent. A version of his examples is given below:

(8) If she had taken arsenic, she would be showing these symptoms.

To see the point more clearly, let us consider the conditional in (8) in two different contexts:

(8a) A: She didn’t take arsenic.
B: Good! But if she had taken arsenic, she would be showing exactly these symptoms.

(8b) A: I don’t really know what happened, but if she had taken arsenic, she would be showing exactly these symptoms.
B: Oh! Didn’t I tell you? She did take arsenic.

² This will be explained in Chapter 4

The conditional in (8) is used in (8a) to make a hypothesis about a state of affairs that we know does not hold in the actual world (let us grant that A is right). It is false that she took arsenic. The conditional says something about how things would have been otherwise. This is a case that we would happily classify as a counterfactual.

The example in (8b) shows that a speaker can use the conditional in (8) to make a hypothesis about a state of affairs without knowing whether it holds or not. And there is nothing odd about finding out later that the antecedent proposition is actually true. There is something different about this case. We would be reluctant to classify the conditional in (8b) as a counterfactual, it has more of an ‘epistemic’ flavor.

However, I do not think that Anderson’s example really counts against a Lewis-Stalnaker account of *would*-conditionals. The Lewis-Stalnaker semantics does not presuppose that the antecedent is false in the evaluation world. The possibility that the evaluation world itself be the most similar world in which the antecedent is true is quite acceptable. Even though we might be reluctant to call the conditional in (8b) a counterfactual conditional, it seems to me that the Lewis-Stalnaker semantics gives the right truth conditions. That is all we need. The fact that we can utter the conditional in (8) both in contexts in which we know that the antecedent is false and in contexts in which we are not sure does not in itself argue in favor of semantic ambiguity. So I will proceed under the assumption that a Lewis-Stalnaker semantics is adequate for *would*-conditionals that have antecedents known to be false and for *would*-conditionals about whose antecedents we are uncertain.

(b) There is a second type of example that appears problematic for a unified account of *would*-conditionals. It is the case of *would*-conditionals with simple past tense morphology in the antecedent clause that make a hypothesis about future events. An example of this kind was mentioned by Lewis himself as a reason to restrict his proposal to the case of counterfactual conditionals ‘proper’, and not try to apply it to *would*-conditionals in general. Lewis’s example is given in (9):

(9) If our troops entered Laos next year, there would be trouble.

(Lewis 1973: 4)

The problem with the example is that we would never utter it if we knew the antecedent was false. Consider the utterance of (9) in the context of (10):

(10) A: Our troops will be recalled by Christmas.
B: Well, that's a good thing. *#If our troops entered Laos next year, there would be trouble.*

The utterance of (9) in the context provided in (10) is clearly infelicitous. But this is hard to explain if the conditional in (9) is treated in the same way as clearly counterfactual conditionals. Consider what happens with the conditional in (11):

(11) A: Our troops will be recalled by Christmas.
B: Well, that's a good thing. *If our troops had entered Laos next year, there would have been trouble.*

In (11) we find a *would*-conditional that has no problem being counterfactual. It is hard to see how to give a unified semantics to this *would*-conditional and the one in (9/10). This is (one of) the reason that Lewis did not propose his semantics as a unified account of *would*-conditionals. However, I will argue that in spite of the differences between the examples in (10) and (11), it is still possible to have a unified semantic account of the modal *would* and derive the differences we observe between the conditionals on the basis of other differences arising from the interpretation of aspect. I will argue for this point in Chapter 4.

Another difference between the proposals put forward by Stalnaker and Lewis has to do with the set of antecedent-worlds that is relevant to the evaluation of the conditional. Both authors agree that the antecedent worlds relevant to the evaluation of the conditional will be some set of worlds in which the antecedent is true that differ minimally from the evaluation world according to some contextually established criteria for similarity. But the authors differ with respect to the exact characterization of the set.

According to Stalnaker, there is a single antecedent world that is relevant for the evaluation of a conditional. In Stalnaker's formal proposal for the interpretation of $>$, this

is captured by making the truth value of $\alpha > \beta$ in a world w be dependent on a selection function f . The selection function f is a function that takes as arguments the evaluation world w and the antecedent proposition α , and yields as value a possible world.³ The conditional asserts that β is true in w' . The truth conditions for $>$ are given below:

(12) $\alpha > \beta$ is true in w if B is true in $f(\alpha, w)$
 $\alpha > \beta$ is false in w if B is false in $f(\alpha, w)$
 (Stalnaker 1968: 103)

The intuitive understanding of Stalnaker's proposal is that the function f picks out the world most similar to the evaluation world in which the antecedent is true (strictly speaking, Stalnaker's views about the resolution of the value of f do allow for ties in similarity, but I am setting this issue aside here). The precise value for f is supplied by the context of utterance of the conditional, thus making the relevant notion of similarity context-dependent.

The proposal for the semantics of *would*-conditionals that I will adopt departs from Stalnaker's position in that it allows the set of antecedent worlds to be larger than a singleton set. That is, I will assume that there can be more than one antecedent world relevant for the evaluation of a conditional and that there can be ties in similarity.

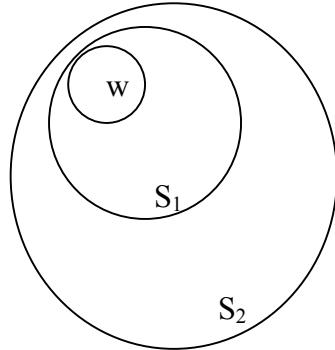
Lewis differs from Stalnaker in claiming that there can be more than one antecedent world relevant to the evaluation of a $\Box \rightarrow$ conditional. Lewis's account of how the relevant antecedent worlds are identified is technically more complex than Stalnaker's. According to Lewis the interpretation of $\Box \rightarrow$ is established relative to a (context-dependent) function that takes as argument a possible world and yields as value a set of sets of possible worlds, called a 'system of spheres', that is 'centered' around the argument world. The system of spheres encodes the context-dependent relation of comparative similarity amongst worlds. There are various conditions that a set of sets of possible worlds must fulfill in order to count as a system of spheres around a world w (see Lewis (1973) for details). Here I will just mention two: the set must be 'centered' on

³ Stalnaker places some formal constraints on the value of f which I will set aside here, see Stalnaker (1968), pp.103-104).

w , that is, the singleton set $\{w\}$ must be a member of the system of spheres; and the set must be ‘nested’, that is, for any two sets A and B in the system of spheres, it must be the case that either $A \subseteq B$ or $B \subseteq A$.

When a set of sets of possible worlds forms a system of spheres around a world w , the sets in the system are related to each other in the manner illustrated by (13):

(13) S_w



In this toy example, the system of spheres around w [S_w] consists of two sets, S_1 and S_2 , where presumably $S_1 = \{w\}$ (because of the centering requirement), and $S_1 \subseteq S_2$.

The context-dependent system of spheres that is established around the evaluation world provides information about the similarity of worlds with respect to the evaluation world: The truth conditions of the $\Box \rightarrow$ operator can then be given relative to a context-dependent system of spheres:

(14) $\phi \Box \rightarrow \psi$ is true at a world i (according to a system of spheres S) iff

- (1) no ϕ -world belongs to any sphere S in S_i , or
- (2) some sphere S in S_i does contain at least one ϕ -world, and $\phi \rightarrow \psi$ holds at every world in S .

(Lewis 1973: 16)

Alternative (1) in (14) gives the conditions in which a counterfactual is vacuously true: if it is true at no world, or at no world corresponding to one of the spheres set up by S . Alternative (2) says that a counterfactual is non-vacuously true if some sphere set up by S does contain world(s) in which the antecedent is true, and moreover, the consequent is true in all worlds in that sphere in which the antecedent is true.

In setting up the semantics of the $\Box \rightarrow$ operator in the way he does, Lewis rejects the *Limit Assumption*. The Limit Assumption is the assumption that for any world i and antecedent proposition α , there is a smallest α -permitting sphere:

(14) *It is the assumption that as we take smaller and smaller antecedent-permitting spheres, containing antecedent worlds closer and closer to i , we eventually reach a limit: the smallest antecedent permitting sphere, and in it the closest antecedent worlds.*

(Lewis 1973: 20)

The system proposed by Lewis does not make valid the Limit Assumption. This is because nothing in Lewis's proposal blocks the case in which a system of spheres around a world w contains a sequence of smaller and smaller spheres without end, so that there isn't such a thing as 'the smallest sphere around w '. According to Lewis, this is a virtue of the system, since there are cases in which we cannot suppose that there is such a thing as the smallest antecedent-permitting sphere. Lewis (1973) gives the example of a counterfactual about a line: let us say that in the actual world there is a line that is just under one inch long and let us consider the counterfactual *If the line had been longer than one inch, ...*. There is no such thing as the most similar world in which the line is longer than one inch. For any x such that there is a world where the line is $1 \text{ inch} + x$, there will be some smaller y such that there is a world where the line is $1 \text{ inch} + y$, and that world will be more similar to the actual world than the first one.

There is obviously much more to be said with respect to the Limit Assumption (see Lewis 1973). What is important for me is to note that by rejecting the Limit Assumption, Lewis makes it impossible to talk, in the general case, about "the most similar worlds in which the antecedent is true". Within his system we cannot, in the general case, identify such a set. However, I will set aside the concerns behind Lewis's rejection of the Limit Assumption, and assume that we can specify the set of antecedent worlds.

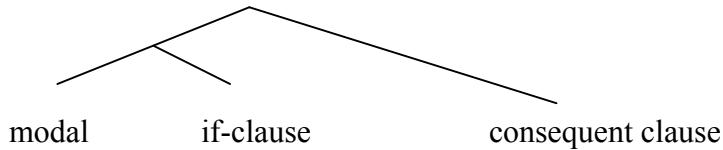
1.3.2 A linguistic twist

In seeking to elucidate the meaning of conditionals, philosophers have typically set up conditional logics with conditional connectives that match our intuitions about the interpretations of English sentences. As we have seen, this is what Lewis and Stalnaker did. However, linguists will typically take another route. This is because linguists are usually interested in the problem of the compositionality of meaning. We want to explain how it is that the meaning of the entire sentences derives from the interpretation of its parts. In approaching the interpretation of *would*-conditionals from a linguistic perspective, the goal is to provide an interpretation of the individual words as well as an explanation of how they combine.

There are various problems to be dealt with in carrying out this program, and I will only attempt to address a few of them in this dissertation. In this section I will try to clarify the scope of the work, pointing out problems that I have set aside.

Following Lewis (1975) and Kratzer (1977, 1981, 1991) I will treat modal verbs (in particular, *would*) as expressions that relate two sets of possible worlds. The first set is (partly) identified by the antecedent clause, and the second set by the consequent clause. Somewhat abstractly (tense and aspect information will be incorporated later), modal verbs appear in tri-partite logical forms like the one in (15):

(15)



According to the syntactic structure in (15), the modal combines first with the *if*-clause, and then with the consequent clause.

It is well known that the proposal in (15) fails to account for a number of important issues. One problem has to do with compositionality itself. In the surface structure of English conditionals, the *if*-clause appears first, preceding the modal, which is followed by the consequent clause. The problem has been addressed by various linguists, in different ways. von Fintel (1995), for example, provided a ‘static’ solution in term of hidden domain variables, whereas von Fintel (2001) provided a ‘dynamic’

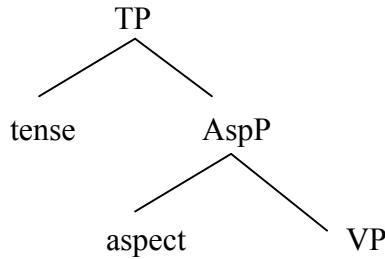
solution in terms of context change semantics. Other authors that have offered dynamic accounts of the interpretation of conditionals include Heim (1982), Chierchia (2000), etc

A dynamic approach appears necessary to give a satisfactory account of the interaction between *if*-clauses and modals. However, I will not adopt a dynamic route in this dissertation. It seems to me that the problems I am interested in can be fruitfully discussed within the (slightly distorted) setting of a static account. I will only refer to some advantages of a dynamic account briefly in Chapter 3. It will take further work to set things fully in motion.

1.4 Some assumptions about the semantics of tense and aspect

I will take as a starting point the following syntactic hierarchy: a structure containing a tense phrase (TP), an aspect phrase (AspP) and a verb phrase (VP) will order them in the following way:

(16)



Given this syntactic structure, tense c-commands AspP, and aspect c-commands the VP. We now need to worry about the interpretation of these pieces. Here I will only discuss some rather general assumptions. More will be said in later chapters.

There are many ways of thinking about the characterization of tense in natural languages. Many proposals are to be found in the linguistic literature, and even in the philosophical literature.⁴ In this dissertation I will adopt a referential theory of tense. Such a view was originally defended by Partee (1973), where the similarity between tenses and pronouns was first pointed out. Kratzer (1998) developed the proposal, extending it to deal with sequence of tense data, as well as the semantics of *de se* belief.

⁴ The reader is referred to Kusumoto (1998) for an overview and comparison.

According to the theory spelled out in Kratzer (1998), past and present tense morphology in English may correspond to a deictic past or present tense. In certain circumstances, both kinds of morphology may also correspond to a 'variable tense'. According to Kratzer the past tense denotes a contextually salient past time, and the present tense denotes a contextually salient present time:

(17) $[[\mathbf{present}]]^C =$ a contextually salient time that includes the speech time
 $[[\mathbf{past}]]^C =$ a contextually salient time that precedes the speech time
(Kratzer 1998)

Kratzer (1998) argues that as well as having a deictic interpretation, English present and past tense morphology may correspond to a zero tense interpreted as a temporal variable (Kratzer's proposal builds on the theory presented in Partee (1973) according to which tense may be characterized as a temporal variable). According to Kratzer, English zero tense is unspecified for morphological features, it bears the same morphological features as the nearest c-commanding tense. Tense morphology simply reflects the features on the nearest c-commanding tense, it is semantically vacuous. The interpretation of zero tense depends on the standard assignment to variables:

(18) $[[\emptyset_i]]^g = g(\mathbf{i}) = t_i$ (Kratzer 1998)

Since the interpretation of zero tense depends on variable assignments, zero tenses can function as bound tenses. This will be important when we discuss the interpretation of tense morphology in *if*-clauses. As we will see, tense morphology in the *if*-clause of *would*-conditionals is interpreted as a variable tense.

Let us now turn to aspect. Kratzer (1998) treats aspectual heads as functions that map properties of events into properties of times. Basically, aspectual heads are responsible for relating events to a time at which they occur (Kratzer's proposal is inspired by Klein's discussion of the relation between events and reference time (Klein 1994)). According to Kratzer's proposal, perfect aspect locates the running time of an event before the reference time and perfective aspect locates it within the reference time.

A more thorough presentation of the semantics of aspectual heads will be given in Chapter 4, where the distinction between perfective and perfect aspect is used to explain variations in the interpretation of *would*-conditionals.

Lastly, I will make the assumption that perfective aspect is the default aspectual head in English. An argument in favor of this position is to be found in Bennett and Partee (1978). Consider the examples in (19)

(19) a. Sara drinks milk.
b. Sara takes the bus.

The examples in (19) do not receive a single-event interpretation. They are most easily interpreted as habituals. It is a well-known fact that in English eventive verbs in the present tense tend to receive a habitual or dispositional reading. Bennett and Partee (1978) proposed an analysis of this fact. Their intuition was that, in order for a present tense sentence to be true, the running time of the eventuality in question must be identical to, or included within, the moment of speech, which they characterized as an instant (an interval of the smallest possible kind). It is clear that for most events it will be the case that the running time cannot be located at the speech time. Take (19b) for example: the running time of an event of Sara taking the bus cannot fit into the speech time, nor is identical to the speech time. It is much bigger. The conclusion is that we could never use (19b) to truthfully assert that Sara is currently taking the bus. There is a fundamental incompatibility between the running time of the event and the time we are trying to fit it in. Since the sentence could never be true under that interpretation, we do not even consider it a possible interpretation. A hearer faced with (19b) will simply take for granted that there is generic or habitual operator. For this reason the sentence typically receives a habitual interpretation.

The crucial ingredient in Bennett and Partee's analysis is the intuition that the present tense in English requires that the running time of an eventuality be included within the evaluation time, which is the instantaneous speech time. I have followed up on this insight by interpreting simple tense morphology as corresponding to tense plus a

default perfective aspect. Perfective aspect locates the running time of an event *within* the evaluation time.⁵ This point will become crucial in Chapter 4.

Let me end this discussion by briefly mentioning a potential objection and stumbling block to the idea that perfective aspect is the default aspectual head. How would such a proposal explain past tense cases, where simple eventive verbs can receive a single-event interpretation? After all, in the past tense a habitual interpretation is not necessary:

(20) a. Sara drank milk.
b. Sara took the bus.

This fact in itself does not argue against Bennett and Partee's view, nor the idea that the default aspectual head is perfective. When dealing with the past tense, the time denoted by tense can be fairly large. It is not problematic to think that it actually does include the event time, even for long events.

⁵ For a longer discussion, that takes into account data from quantificational statements and deals with the interpretation of present tense in more detail, the reader is referred to Arregui (2000).

Chapter 2

THE IMPORTANCE OF THE PAST

2.1 Introduction

Counterfactual conditionals provide us with information about our world. This is because the truth value of a counterfactual conditional in the actual world depends on what is happening in the actual world. Consider a famous example:

(1) *If Nixon had pushed the button, there would have been a nuclear holocaust.*
(Fine, 1973)

Many people believe this conditional to be true. But they also believe that if things in the actual world had been different, it could have been false.

At first glance, the informativity of counterfactuals could seem slightly curious. After all, Nixon didn't actually push the button. The conditional doesn't seem to be about things that have actually happened. So why does it provide us with information about the actual world? How can the truth value of the conditional depend on what has actually happened?

According to a Lewis-Stalnaker style semantics for (counterfactual) conditionals, the interpretation of sentences like (1) involves quantification over possible worlds. Actual world facts affect the truth-value of sentences like (1) because they determine which worlds are quantified over. In a Lewis-Stalnaker semantics, the domain of quantification is made up of the most similar worlds to the actual world in which the antecedent is true. Similarity with the actual world is crucial in determining whether a world will get into the domain of quantification or not. So, it is properties of the actual world that are responsible for identifying the domain of quantification.

In discussing the relevance of possible worlds, and of a theory of possible worlds, Lewis 1986 makes the following statement:

Here is our world, which has a certain qualitative character. (In as broad a sense of 'qualitative' as may be required – include irreducible causal relations, laws, chances, and whatnot if you believe in them.) There all the various A-worlds, with their various characters. If some (A-and-C)-world is closer to our world than any (A-and-not-C)-world is, that's what makes the counterfactual true at our world. Now, whether or not this closeness ought to be called similarity, still somehow it's a matter of the characters of the worlds in question. So, after all, it's the character of our world that makes the counterfactuals true. (Lewis 1986: 22)

My objective in this chapter is the following: I want to argue that the reason the truth value of counterfactual conditionals (and *would*-conditionals in general) depends on actual world facts is that *would*-conditionals are about the actual world past (actual world past = $past_0$). I want to shift the role played by the relation of overall similarity in the Lewis-Stalnaker analysis to similarity in the past. I will provide two kinds of arguments for this move: I will show that it gives us better insight into the criteria deployed in identifying the quantificational domain of modals in *would*-conditionals, and I will show that it gives us an understanding of the presence of past tense morphology.

The structure of the chapter is the following. In §2.2 and §2.3 I will describe various reasons why we should be interested in the past when we worry about the interpretation of *would*-conditionals. In §2.4 and §2.5 I will present a proposal for making sense of the special role of the past and the interpretation of past tense morphology. Finally, in §2.6 I will discuss two previous proposals about the role of past tense morphology and semantics in modal contexts.

In this chapter I will set aside the difference between simple *would*-conditionals and those with past perfect morphology in the antecedent clause. For this reason, some of the characterizations will be termed "preliminary". The issue will be taken up in Chapter 4.

2.2 Past tense morphology in counterfactual conditionals

Let me start by making the case that understanding the role of the past is important when thinking about *would*-conditionals. There are two reasons to think we

should worry about the past: (1) we make counterfactual hypothesis using past tense morphology (and this is not an accident of English), and (2) we give the past special importance when judging the truth value of counterfactuals. These are two different kinds of reasons, to be approached in different ways. I will deal with them in this section and in §2.3.

We begin with the morphology question. In addition to the past marking on the modal, some *would*-conditionals appear to bear simple past tense morphology in the antecedent clause, while others appear to have past perfect morphology. Illustrations are provided in (2):

(2) a. She doesn't love him. If she loved him, she wouldn't marry him.
b. She didn't smile at him. If she had smiled at him, he would have smiled back.

The verbal morphology that we see in the antecedent clauses in (2) looks like past tense morphology (2a), with perfect aspect (2b). However, the typical past and past perfect meanings appear to be missing. The antecedent in (2a) makes a hypothesis about the speech time, not the past. The antecedent in (2b) seems to lack the typical past-in-the-past interpretation of the past perfect. The examples below further illustrate this point:

(3) a. She finally decided to kiss him yesterday. If she had kissed him tomorrow, he would have been very confused.
b. I am sure she is arriving today. If she arrived next week, she would have sent us an email.

In spite of the presence of past and past perfect morphology, the antecedent clauses in (3) make hypothesis about future times. This is indicated by the future adverbials *tomorrow* and *next week*.

Evidence of the difficulty of explaining the nature of tense morphology in *would*-conditionals can be found in the literature. Philosophers have often been happy to favor a *mood*-approach, and talk about *subjunctive* conditionals (a.o. Chisholm (1946), Anderson

(1951)), ignoring questions about tense (amongst the exceptions: Dudman (1984) who talks about 'back-shifted tenses', and Bennett (1988)). Grammarians often do not agree with each other:

"If he heard, he gave no sign (heard and gave past time); and if he heard, how angry he would be! (heard and would be, not past time, but utopia, the real of non-fact or imaginary); the first heard is indicative, the second subjunctive. (Fowler's Modern English Usage, 1965: 597))⁶

yet

"If we were to say that all verbs had a preterite-irrealis distinction we would be claiming that the massive coalescence of realisational forms that has taken place in the development of English has not produced a change in the system of verb inflection itself, but merely large-scale syncretism. It is much more plausible to say that irrealis "were" is an unstable remnant of an earlier system - a system which has otherwise been replaced by one in which the preterite has expanded its use in such a way that it now serves to express modal remoteness as well as past time."

(The Cambridge Grammar of the English Language. 2002: 88)

Some linguists have suggested that we see modal agreement morphology in *would*-conditionals, without saying anything about tense (a.o. Heim (1992), von Fintel (1999)); others have argued for subjunctive and tense features (Portner 1992). Others yet have focused on tense and temporal relations, setting aside the issue of subjunctive mood (Iatridou (1999), Ippolito (2003), Condoravdi (2001)).⁷

There is an obvious appeal to the idea that the morphology we see in (2) really is past tense morphology. It looks like past tense morphology. The conclusion that there are

⁶ Quoted in Edgington (1995), pp. 240.

⁷ Alternative proposals will be presented in §6.

two distinct allomorphic paradigms⁸, a past tense paradigm and a subjunctive mood paradigm, should really be a last-resort conclusion. It is not supported by common sense (as the *Cambridge Grammar* points out). It is also disfavored by cross-linguistic considerations, since, as we will see below, languages other than English appear to show past tense morphology in the antecedent of *would*-type conditionals. Of course, the possibility of defending this common sense approach depends on making correct predictions about the interpretation. The idea that we are looking at past tense morphology faces an obvious challenge:

Question 1:

How does the semantics of past tense fit into the interpretation of *would*-conditionals?

2.2.1 Tense morphology in *would*-conditionals is not just mood agreement

As I mentioned above, the issue of tense has often been set aside in the literature on *would*-conditionals. The morphology in the antecedent clause has been characterized as 'mood morphology', and the question of tense has been ignored. In this section I would like to present data from Spanish showing that we do not solve the tense problem by switching to mood.

Spanish differs from English in having a productive and clearly identifiable subjunctive paradigm. Within this paradigm, it is possible to distinguish both past and present tense forms. Examples are provided in (4):

(4) a. Dudo que esté acá.
doubt-PresInd that be-PresSubj here
I don't think he/she/it is here'

b. Dudo que estuviera acá.
doubt-PresInd that be-PastSubj here
I don't think he/she/it was here'

⁸ Except for the third person singular, where we observe the *was/were* alternation.

The verb *dudar* ('doubt') selects for subjunctive in its complement clause. If the complement clause has a present subjunctive (4a), the doubt is about something going on at the speech time. If the complement clause has a past subjunctive (4b), the doubt is about something having taken place before the speech time. The examples illustrate that the past/present distinction in the subjunctive mood has (or at least can have) the expected temporal consequences.

Subjunctive morphology is obligatory in the antecedent clause of counterfactual conditionals in Spanish. I do not have anything to say about the interpretation of subjunctive mood itself. Of interest to us here is the fact that in Spanish it has to be past subjunctive morphology:

(5) No está acá.
 not be-PresInd here
 '*He/She/It is not here*'

a. Si estuviera acá (ahora), te diría lo mismo.
 if be-PastSubj here (now), you say-would the same
 '*If he/she/it was/were here, she would tell you the same thing*'

b. *Si esté acá (ahora), te diría lo mismo.
 be-PresSubj

Even though tense morphology in (5a) is past, it does not receive a 'past interpretation'. The antecedent clause in (5a) makes a (counterfactual) hypothesis about something going on at the speech time: if she were here now, she would tell you the same thing. The example in (5b) shows that a present subjunctive is unacceptable (even in the absence of the context sentence in (5)).

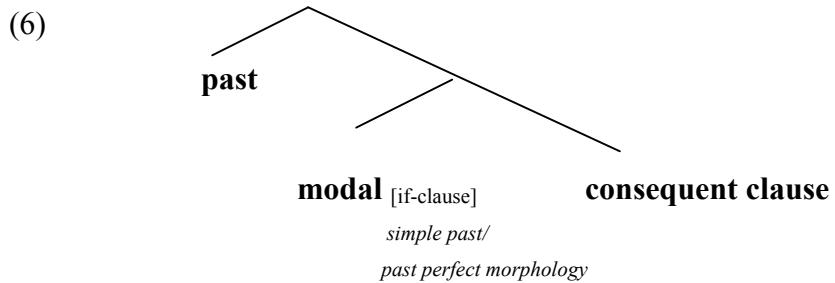
The examples show that we do not solve the tense problem by appealing to mood agreement. Languages that have mood agreement in counterfactual conditionals (such as Spanish) may still have a non-standard interpretation of past tense morphology. So even if we were to characterize the morphology we see in English *would*-conditionals as

subjunctive morphology, it would still be necessary to say something about tense. It is tempting to conclude that we should just accept the idea that there is past tense morphology in English counterfactuals, and face the task of explaining how it is interpreted.

2.2.2 On the relation between *if*-clauses and tense

In this section, I will discuss the interpretation of the *if*-clause and its relation to past tense. As I mentioned in the introduction, I will largely ignore specific details about the combinatorics that relate the *if*-clause to the rest of the sentence. For the sake of concreteness, I adopt a tripartite structure analysis where the *if*-clause and main clause are arguments of the modal (see a.o. Heim (1982)). However, as I mentioned before, I believe a dynamic view is probably needed (see a.o. Heim (1982), von Fintel (2001), Bhatt and Pancheva (2001) for discussion).

In this dissertation I argue for the presence of a real past tense in *would*-conditionals. Specifically, in my analysis the past tense found in *would*-conditionals is the past tense corresponding to the (past) modal *would*. The structure I propose is the structure in (6) (the interpretation will be discussed in §2.4). Past tense c-commands the modal, resulting in a modal bearing past tense morphology.



We need a semantic account of the interpretation of the higher past tense. This will be the topic of §2.4. But we also need to say something about the interpretation of tense morphology within the *if*-clause. I want to discuss this last point here, and address the following two questions: (a) what is the interpretation of past tense morphology in the *if*-clause? and (b) how is it that *if*-clauses appear to make hypothesis about future (or non-past) events?

Let us start with (a). Examples like (7) indicate that there is no real semantic past tense within the *if*-clause:

(7) a. If she lived in California, she would be tanned.
b. If she smiled at him, he would smile back.

We (can) understand (7a) as making a hypothesis set at the speech time. And we understand (7b) as making a hypothesis set in the future. Tense morphology clearly does not correspond to a deictic past tense interpreted as part of the antecedent clause. The antecedent clause hypothesis are not set in the past.

The examples in (8) further illustrate this point. As we have already seen, in these examples a futurate temporal adverbial explicitly indicates that the antecedent clause makes a hypothesis set in the future:

(8) a. She kissed him yesterday. If she had kissed him tomorrow instead, he would have been confused.
b. I am sure she is arriving today. If she arrived next week, she would have sent us an email.

To account for this 'mismatch', I will propose an analysis according to which tense morphology in the *if*-clause corresponds to a 'variable' tense, not a real, deictic, past tense.

As mentioned in the introduction, I adopt a referential theory of tense. According to this view, tenses refer to temporal intervals, and function much like temporal pronouns. Past tense morphology may be interpreted either as a deictic past tense or as a variable tense. A deictic past tense makes reference to a contextually salient past time:

(9) $[[\mathbf{past}]]^c = t$, where t is a salient past time

We find a deictic interpretation of past tense morphology in simple examples like (10b):

(10) a. A: What happened then?
 b. B: She laughed.

In (10b) past tense morphology denotes a salient past interval. The statement claims that the laughing event is included within that interval.

Not all past tense morphology is interpreted as a deictic past tense. It has been claimed that in *sequence of tense* contexts, tense morphology simply copies the features of a higher tense (a.o. Enc (1987), Stowell (1995), Ogihara (1996), Kratzer (1998)). In such contexts tense morphology does not receive a deictic interpretation. An example is given in (11): the verb in the embedded clause bears past tense morphology, but the temporal interpretation is of overlap.⁹.

(11) She said that she loved him.

The matrix past tense in (11) fixes the saying event in the past, and the embedded tense is interpreted as dependent on the matrix tense. The morphological features of the embedded tense simply copy the features of the higher tense. 'Copy' tense morphology is interpreted as a temporal variable. The variable interpretation is spelled out in (12):

$$(12) \quad [[\mathbf{t}_1]]^g = g(\mathbf{t}_1) = t_I$$

According to (12), a variable tense simply refers to whatever interval is assigned to the variable by the assignment function of the interpretation.

My idea is that tense in the antecedent clause is a variable tense, and that *if*-clauses function as sequence-of-tense examples. Tense in the *if*-clause surfaces with past morphology because it bears the morphological features of the higher past tense, commanding the modal. The tense features in the antecedent clause are the result of agreement, similarly to the tense features in standard sequence of tense cases.

⁹ This is one of the views in the sequence of tense literature. There are others. I am simply adopting it here for the sake of exposition.

Semantically, *if*-clauses denote properties of times: tense in the antecedent clause is a variable tense bound by a lambda operator. As we will see in §2.4, properties of times constitute the first arguments of the modal. A preliminary denotation is given in (13a):¹⁰

(13) Preliminary:

- a. If she kissed him, he would kiss her back.
- b. $[[\mathbf{If \, she \, kissed \, him}]] = \lambda t \lambda w [\text{she-kissed-him at } t \text{ in } w]$

The antecedent clause denotes a property of times that is true of a time in a world if the time includes an event of her kissing him in that world.

Let us now turn to (b): how is it that antecedent clauses typically make hypothesis about non-past events? I suggest that it is the modal that is responsible for shifting the time of the antecedent clause towards the future. The modal combines with the property of times that is the denotation of the antecedent clause and claims that the property holds of a non-past time (other people who have held the modal to be responsible for the future orientation of the antecedent clause include Enç (1990), Condoravdi (2001), etc.). The proposition corresponding to the antecedent clause will be the proposition in (14) (more details will be given in §2.4 and §2.5):

(14) Preliminary

Where t is some non-past time,
 $\lambda w [\text{she-kissed-him at } t \text{ in } w]$

The proposition in (14) holds in a world if there is a kissing event that has a running time that follows the speech time. This is the proposition corresponding to the antecedent clause in (13a).

¹⁰ This is preliminary, and somewhat informal, and will be revised in Chapter 4, after we discuss the role of aspect.

Summing up, I have adopted a structure that recognizes the presence of a real past tense in *would*-conditionals. Past tense in *would*-conditionals is found c-commanding the (past) modal *would*. I have argued that past tense morphology in the antecedent clause is a case of agreement morphology, like the one found in (standard) sequence of tense cases. Morphology in the antecedent clause simply reflects the morphological features of the higher c-commanding past tense. The possibility of defending this view depends on being able to make semantic sense of the idea that in *would*-conditionals a 'real' past tense c-commands the modal. I will turn to that in §2.4 .

2.3 The importance of the past

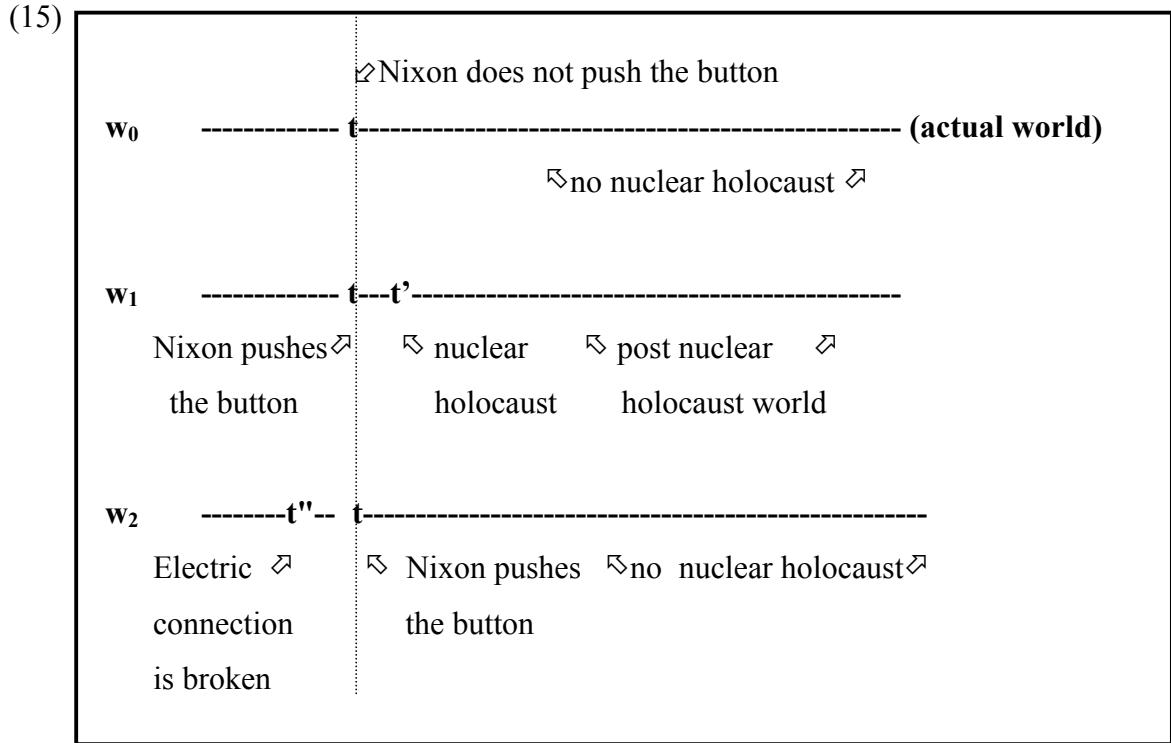
As we have seen (Chapter 1, §1.3), the notion of similarity is a crucial part of the analysis of counterfactuals defended in Lewis (1973). However, some authors have found Lewis's use of the similarity relation in the truth conditions of counterfactuals to be problematic (a.o. Slote (1988), Bennett (1984), Fine (1975)). In his review of *Counterfactuals*, Kit Fine makes the following observation:

(14) *The counterfactual 'If Nixon had pressed the button, there would have been a nuclear holocaust' is true or can be imagined to be so. Now suppose that there never will be a nuclear holocaust. Then that counterfactual is, on Lewis' analysis, very likely false. For given any world in which antecedent and consequent are both true it will be easy to imagine a closer world in which the antecedent is true and the consequent false. For we need only imagine a change that prevents the holocaust but that does not require such a great divergence from reality.*

(Fine1975: 452)

The counterfactual *If Nixon had pressed the button, there would have been a nuclear holocaust* is (usually) judged true. The modal quantifies over worlds in which Nixon pushes the button. The statement is true if the most similar such worlds are worlds in which there is a nuclear holocaust. Since (14) is true, this means that the modal quantifies over worlds like w1 in (15) below. The problem, according to Fine, is that Lewis's use of similarity in establishing the quantificational domain of the modal makes incorrect

predictions: the most similar worlds in which Nixon pushes the button should be worlds in which there is no nuclear holocaust. One kind of 'counterexample-worlds' mentioned by Fine are worlds like w_2 in (15):



In worlds like w_2 , Nixon pushes the button, but the electric connection was broken beforehand, and the signal does not go through. Fine considers that a world like w_2 , which differs from w_0 only with respect to the connection being broken before the button is pushed, is more similar to w_0 than a world like w_1 , in which there is a nuclear holocaust.

Fine's objection is that in numerous cases (maybe even in most) the similarity clause in Lewis's analysis leads to predictions that clash with our intuitions. It is very easy to find a world in which the antecedent is true and the consequent is false that intuitively differs less from the actual world than one in which both the antecedent and consequent are true.

Lewis's reply (Lewis 1979) is to question the notion of similarity that Fine takes for granted. Even though Fine is correct in claiming that in some sense worlds like w_2 are

more similar to w_0 than worlds like w_1 , this is not the notion of similarity that is responsible for identifying the quantificational domain of the modal in the counterfactual, according to Lewis. For Lewis, the similarity relation that identifies the quantificational domain of the modal obeys constraints that together favor spatio-temporal match with the past in the actual world. Worlds like w_2 differ from the actual world at some time before the evaluation time of the antecedent clause (the electricity was disconnected before the time at which Nixon pushed the button). Given the special notion of similarity, worlds like w_1 will be more similar to w_0 than worlds like w_2 , because w_1 and w_0 are more similar in the past (before the button-pushing time) than worlds like w_2 and w_0 . This gives rise to the next important question about the past:

Question 2: In identifying the quantificational domain of the modal, similarity in the past seems to count for more. Where does the past requirement come from?

2.3.1 The Adams examples and their consequences

Before moving on to my analysis, let us take a brief detour through an observation made by Ernest Adams. In a 1970 paper, Adams argued against a unified analysis for conditionals. He used the examples below:

(16) a. If Oswald didn't kill Kennedy, somebody else did.
b. If Oswald hadn't killed Kennedy, somebody else would have.

Adams pointed out that our judgments about the conditionals in (16) differ. While most people agree with (16a), many disagree with (16b). Given that Kennedy has been shot, but unsure as to who did it, we are prepared to accept that if Oswald didn't do it, it must have been somebody else. We accept the truth of (16a). However, this chain of reasoning does not lead us to accept that (16b) is true. Entertaining the hypothesis that Oswald might not have killed Kennedy, we do not conclude that the somebody else would have done it. We are happy to consider the non-actual possibility that Kennedy would not have

been shot at all. This difference in judgments led Adams to conclude that (16a) and (16b) cannot be given a unified analysis.

The obvious superficial difference between (16a) and (16b) is the presence of a past tense modal (*would*) in (16b). This difference seems to correlate with the difference between conditionals that allow us to quantify over worlds that differ from the actual world (in which Kennedy was not shot) (16b), and conditionals that don't (16a).

Looking only at these examples, it may appear as if the crucial feature of (16b) is simply the presence of a modal. However, I would like to argue that the important difference is not simply the modal, but the past tense morphology on the modal. To see this, consider the examples in (17):

(17) a. He is not living in her house. *#If he is / has been living in her house, she will have told her parents.*

b. He is not living in her house. *If he were / had been living in her house, she would have told her parents.*

As (17a) illustrates, a conditional with *will* cannot be used to make a counterfactual hypothesis. As the example in (17b) shows, the past tense form *would* must be used.

The difference between *will* and *would* does not arise only with hypothesis about past events. Edgington (1995) discusses similar examples where the hypothesis are set in the future:

(18) “You think that such-and-such will happen. You can distinguish the questions: *But what if it doesn't?* (i.e. what if you are wrong in thinking it will?); and *But what if it were not going to?* (retaining your belief that it will). For instance, there are two prisoners, Smith and Jones. We have powerful evidence that one of them will try to escape tonight. Smith is a docile, unadventurous chap, Jones just the opposite, and very persistent. We are inclined to think that it is Jones who will try to escape. We have no reason to accept:

(3c) If Jones were not to try to escape tonight, Smith would.

However, we could be wrong in thinking that it is Jones who will escape:

(3d) If Jones doesn't try to escape tonight, Smith will."
(Edgington 1995)

It is interesting to see that the presence of a past tense is necessary to license a hypothesis that goes contrary to the facts. In contemplating the importance of the past, we have focused on the fact that we pay particular attention to 'sameness' in the past when evaluating *would*-conditionals. As we have noted, similarity in the past seems to count for more. The discussion above shows that *pastness* is also important in a different way: past tense is responsible for allowing us to deviate from the actual world, and consider hypothesis that depart from actual world facts.

This makes sense. The criteria for identifying the domain of quantification of the modal is similarity. And the similarity requirement, in a way, has two sides. Given that the worlds quantified over must be similar to the actual world, they must share as many (relevant) properties as possible with the actual world. And given that the worlds quantified over need only be similar to the actual world, they may have properties that differ from those of the actual world.

The proposal that I will develop in this chapter deals with both sides of the similarity coin. The proposal connects the presence of past tense morphology to the particular importance of the past in evaluating similarity (the domain of quantification of the modal is made up of worlds that are similar to the actual world in the past). The proposal also connects the presence of past tense morphology to the possibility of allowing for differences (the domain of quantification may include worlds that are different from the actual world in the past).

2.4 A *de re* analysis of *would*-conditionals

My concern in the last two sections has been to argue that we should take past tense morphology seriously, and that we should pay attention to the fact that we grant the past special importance when evaluating similarity. In this section I will lay out the

pieces of an analysis that aims at bringing these two issues together. The analysis claims that *would*-conditionals make *de re* claims about the past. The proposal leans heavily on Lewis's 'counterparts' solution to the problem of trans-world identity of individuals. For further details, the reader is referred to Lewis's own work (especially Lewis 1986). It seems relevant to note, however, that even though I make use of Lewis's counterpart theory, my proposal is not necessarily tied to Lewis's views on metaphysics.

2.4.1 Counterpart relations amongst individuals

According to Lewis, individuals are parts of possible worlds. In Lewis's use of the term, this has very particular consequences. As parts of possible worlds, individuals are found in only one world. An individual cannot be part of two or more worlds.

In a way, this is puzzling. As semanticists, we (standardly) make sense of modal talk in terms of possible worlds. When we say that some actual world individual might have been different, we are saying that in some other possible world, the individual is different. But Lewis claims that an actual world individual does not inhabit any possible world other than the actual one. How can we then make sense of modal talk about individuals?

Lewis's idea is that modal claims about individuals should be understood in terms of non-modal claims about counterparts of individuals. When we claim that some actual world individual might have been different, we are claiming that some other individual, in another world, who is a counterpart of the actual world individual, is different. Modal talk about individuals is understood in terms of non-modal claims about counterparts of individuals.

Let's say (using standard terminology) that when we make a modal claim about an actual world individual, we are making a *de re* modal claim about that individual. Lewis's proposal is that modal claims made *de re* should be interpreted as non-modal claims made about counterparts.

Imagine a modal claim made *de re* about the actual world winner of the last presidential elections. An example is given in (19):

(19) The winner of the last presidential elections could have lost.

From Lewis's perspective, the interpretation of (19) is such that it is true only if in some possible world a counterpart of the actual world winner has the (non-modal) property of losing.

The example in (19) is very helpful in that it is easy to see that the descriptive content of the noun phrase is not part of the modal claim. That is, (19) does not claim that in some possible world the winner in that possible world lost in that possible world. The role of the description is to identify the individual the claim is about in the actual world.

Counterpart relations between individuals in different worlds depend on similarity. Two individuals are considered counterparts of each other if they are similar enough.¹¹ Intuitively put, a counterpart of an individual is another individual that, as far as we are concerned, could have been the person we are talking about in the actual world.

The similarity relations that underlie counterpart relations depend on the context of utterance. Different parameters can be relevant in figuring out whether two individuals are similar enough to be considered counterparts of each other. For example, we will judge (19) true only if we find some individual in another possible world, that we consider sufficiently similar to the actual world winner to 'count' as his counterpart, and that individual lost. An example of an individual who might count as similar enough to be a counterpart is given in (20):

(20) <u>actual world</u>	<u>another possible world</u>
1	<---counterpart of ---
won the last elections	lost the last elections
has brown hair	has brown hair
has a dog	has a dog
is Republican, etc.	is Republican, etc.

¹¹ I am setting aside technicalities about the counterpart relation that are not really relevant here. See Lewis (1971).

If we fail to find a suitable counterpart, we judge the modal claim false. Let's look at an example:

(21) The winner of the last presidential election could have been vegan.

Suppose we understand (21) as a *de re* modal claim made about the actual winner of the last presidential elections (not as the *de dicto* claim that in some possible world whoever won the elections in that possible world is vegan). We will judge (21) true only if we find some vegan individual in another possible world who we consider similar enough to the actual world winner to be his counterpart.

Imagine now that the actual world winner is a strong supporter of the beef industry, and we are in a context where similarity with respect to political alliances is of great importance. Any individual that counts as a counterpart of the actual world winner will be similar to him with respect to his support for the beef industry, and fail to be vegan:

(22)	<u>possible world 1</u>	<u>actual world</u>	<u>possible world 2</u>
	$\pmb{1}_2$ is counterpart of \rightarrow	$\pmb{1}_1$ \leftarrow is not counterpart of $\pmb{1}_3$	
	is president	is president	is president
	is Republican	is Republican	is Republican
	is not vegan	is not vegan	is vegan
	has black hair	has brown hair	has brown hair

Given the contextual requirements on similarity, there isn't a counterpart who is vegan, and (21) is false.

2.4.2 Modal claims about the past

We use *would*-conditionals to make hypothesis about what would have happened if things had been different. What things? My answer is: past things. We use *would*-conditionals to make *de re* modal claims about the past.

Let us start by noting the idea that we are living at a particular time in the history of our world. Let us grant that there is nothing special about the present except the fact that it is now. The part of the world that precedes now, we call 'the past', the part that follows, we call 'the future'.¹²

Would-conditionals make claims about what would have been the case if the past in the actual world had been different. In my analysis, the claims have the following shape: *if the past had preceded a time with a certain property X, it would also have preceded a time with a certain (other) property Y.*¹³ This proposal about the role of the past will be central in explaining both the presence of past tense morphology and the particular importance we grant the past for the purpose of evaluating similarity.

Let us consider an example:

(23) She doesn't love him. If she loved him, she wouldn't have married him.

The conditional in (23) is a counterfactual conditional. The hypothesis that she loves him goes against actual world facts. However, it seems to be a hypothesis set in the present. Why say that the conditional is about the past?

This conditional is about the past in the sense that, according to my analysis, it makes a claim as to what would have happened if the past had been different. If the past had led to this: *she loves him*, it would also have led to this: *she won't marry him*. In other words, if the past had preceded a time at which she loves him, it would also have preceded a time at which she has refused to marry him.¹⁴

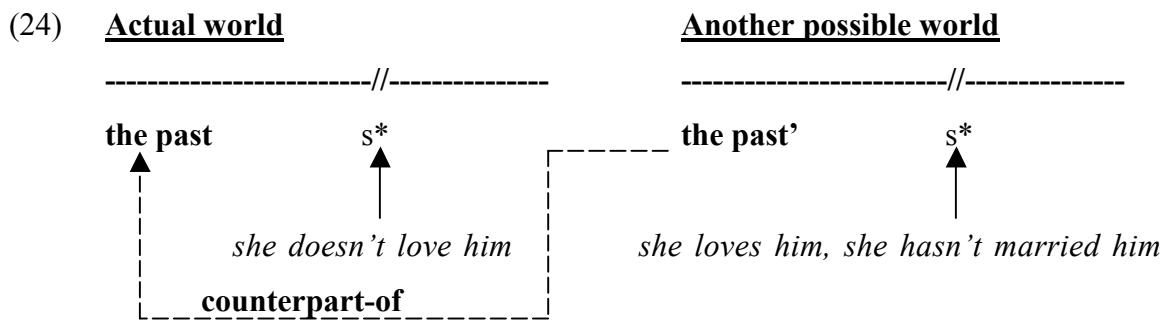
In the case in (23), the *would*-conditional makes a counterfactual de re hypothesis about the past. The actual world past does not actually lead up to a time at which she loves him. It doesn't have that property. How do we make sense of the idea that the past

¹² I am (secretly) making metaphysical assumptions here: the past, present and future all exist; there is nothing ontologically special about the present, etc. As the philosophical literature shows, the view is not uncontroversial. But I won't defend it here.

¹³ An alternative would be to say: *if the past had caused X, it would also have caused Y*. In many ways, this would be a more intuitive way of understanding what is going on. However, Lewis wanted to provide an analysis of causation in terms of counterfactuals, and I am trying very hard to avoid getting into that debate.

could have had properties different than the ones it actually has? From a Lewis-style perspective, the actual world past is part of the actual world, and of no other world. In that sense, it is similar to ordinary individuals. Modal claims about the past have to be understood in terms of counterparts, the same as modal claims about more ordinary individuals.

To make a *de re* hypothesis about the actual world past, we look for a counterpart of the past in worlds in which the antecedent clause proposition is true (in the case of (23), these are worlds in which she loves him). To find out if the *would*-conditional is true, we then check whether the consequent clause is true in such worlds (does she marry him?). As with all counterpart relations, similarity will play a big role in figuring out how to identify the past in other worlds.



The conditional in (23) claims that the worlds in which a counterpart of the actual world past precedes a time at which she loves him are also worlds in which she hasn't married him.

According to my analysis, the modal operator quantifies over worlds that include a counterpart of the actual world past. Similarity in the past is predicted to be of great importance. But diversity will be allowed. The domain of quantification may include worlds that differ from the actual world in the past. And this is important. The flexible nature of the counterpart relation will ultimately explain why we use the past tense to make hypothesis that are counterfactual. We look for versions of the past similar enough

¹⁴ In terms of cause: *If the past had caused her to love him, it would also have caused her not to marry him.*

to the actual world past, but the notion of counterpart allows us to accommodate differences.

Before spelling out more details, let me point to some of the advantages of thinking of *would*-conditionals as *de re* modal claims about the past. The approach explains why past facts matter so much. It explains the presence of past tense morphology. And it explains why these conditionals allow us to deviate from actual world facts. We are not forced to restrict the domain of quantification to worlds that are identical to the actual world (we could end up with an empty set!). The weaker constraint of similarity is all that is required for counterpart relations.

2.4.3 Putting the pieces together

Let us take stock of where we are. We have established that the antecedent clauses in *would*-conditionals do not include a deictic tense. They contain a variable tense that is abstracted over, denoting a property of times. This is the first argument of the modal. We have also argued out that there is a real past tense c-commanding the modal, that ‘anchors’ the interpretation of the conditional to the actual world via the relation of similarity (counterparts of the past). I propose to combine these pieces as in (25):¹⁵

(25) $[[\mathbf{woll-} t_i]]^g: \lambda P_{<i, <s, t>} \lambda Q_{<i, <s, t>} \lambda t \forall w [t < w \ \& \ P(g(t_i))(w) \rightarrow Q(g(t_i))(w)]$

where g is an assignment function, and $g(t_i)$ is restricted to non-past times

According to (25), the modal comes with a temporal index, whose denotation is restricted to non-past times. The modal takes as its first two arguments two properties of times. It shifts the evaluation of such properties to some (salient) non-past time. As a result, propositions corresponding to antecedent and consequent clauses make claims about non-past times.

The c-commanding past tense found above *would* does not provide the temporal parameter for the temporal properties corresponding to the antecedent and consequent clauses. That parameter comes from the index associated with the modal itself. Instead, the past tense saturates the temporal argument of the modal. According to (25) the

¹⁵ I am grateful to an anonymous source for advice on this proposal.

temporal argument of the modal has the role of restricting the domain of quantification: the modal quantifies over possible worlds to which the temporal argument bears the *part-of* relation (\lessdot).

In a Lewis-inspired mode, I will flesh out the referential theory of tense, and assume that tenses denote times construed as parts of worlds. In a fairly standard way of thinking about times, they are conceived as 'slices' of world history. In our examples, a real past tense denotes $past_0$ (the past slice of the actual world).

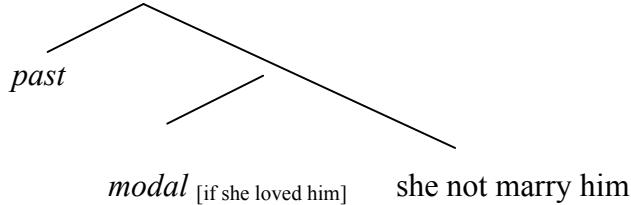
The symbol \lessdot in (25) represents the *part-of* relation. I have said earlier that *would* quantifies over worlds that include the past. I mean to say that it quantifies over worlds such that the past is part of them. I will not elaborate on the *part-of* relation, and will treat it as a primitive.¹⁶ Intuitively, we can think of it in the following way: the actual world past ($past_0$) is *part-of* another possible world only when the history of that possible world matches the past in a sufficiently close manner. That is, when the actual world past has a counterpart in that other possible world. So, for any world w' , the claim that $past_0 \lessdot w'$ will be true iff there is a counterpart of $past_0$, let us call it $past_0'$, that is part of w' . To claim of the actual world past that it is part of another possible world is to make a modal claim about the past piece of the actual world. And, as all modal claims about pieces of the world, it should be understood in terms of counterparts.

According to the proposal in (25), the modal combines with the temporal interval corresponding to the past tense, yielding the truth value *true* iff all worlds that contain (counterparts of) the actual world past in which the antecedent clause proposition is true are also worlds in which the consequent clause proposition is true. The proposal claims that the modal quantifies over worlds that contain a counterpart of the actual world past. For this reason, I say that past tense affects the nature of the worlds accessible to the modal.

To see (25) in action, let us work through an example:

¹⁶ Discussions of the *part-of* relation are to be found in the philosophical literature dealing with the mereological composition of individuals.

(26)



(27) a. If she loved him, she wouldn't marry him

b. *Preliminary*

$$[[\mathbf{if she loved him}]] = \lambda t \lambda w [\text{she-loved-him at } t \text{ in } w]$$

c. *Where t is a non-past time,*

$$[[\mathbf{if she loved him, she wouldn't marry him}]]^{w^0} = 1 \text{ iff}$$

$$\forall w [[\text{past}_0 < w \& \text{she-loved-him at } t \text{ in } w] \rightarrow$$

$$[\text{not she-marries-him at } t \text{ in } w]]$$

According to the proposal in (27), (23) is true iff all possible worlds in which the proposition that she loves him is true that contain a counterpart of the actual world past (past_0), are also worlds in which the proposition that she does not marry him is true.

2.4.4 A difference

According to the proposal I have spelled out above, the domain of quantification of the modal is made up of the possible worlds that contain a counterpart of the past (under the contextually relevant similarity relation) in which the antecedent clause is true. This idea differs from the original Lewis-Stalnaker proposal, according to which the quantificational domain of the modal is made up of the most similar possible worlds in which the antecedent clause proposition is true.

The two views diverge in the following way:

Suppose we are evaluating a *would*-conditional “if A, would B”. According to the Lewis-Stalnaker analysis, the domain of quantification of the modal will be made up of the most similar worlds in which A is true. Whatever the contextually salient similarity

relation turns out to be, there will be some such worlds. The truth value of the conditional will depend exclusively on the truth value of the consequent in such worlds.

The proposal I have spelled out here could have a potentially different outcome. According to my proposal, the contextually salient similarity relation determines what counts as a counterpart of the actual world past. The domain of quantification of the modal is then made up of worlds that include a counterpart of the past in which the antecedent clause proposition is true. But suppose there are no such worlds? After all, the antecedent clause proposition could be incompatible with some of the features that context requires should be similar in the past counterparts. The domain of quantification of the modal would then be empty.

I don't think this difference will be relevant in practical terms. It would be really odd if the contextually relevant counterpart relation were such that the domain of quantification of the modal turned out to be empty. For this reason, I think the difference in the approaches won't have bad practical consequences. Still, it is something worth exploring further, in future work.

2.5 Identifying the past in other worlds: the similarity requirement

According to my proposal, the quantificational domain of the modal is not made up of the most similar worlds in which the antecedent is true. It is made up of the worlds in which there is a counterpart of the past in which the antecedent is true. Contextually given similarity relations are invoked in both cases, so what is the big deal?

I think that the approach I defend here has an intuitive advantage. It is often striking that the similarity relation relevant for counterfactual reasoning is not really an ordinary similarity relation. In some cases, it is difficult to explain, in an intuitive way, why some option is considered more similar than others, or as similar as others. The approach I take here shifts the problem slightly. It is not a matter of finding the most similar cases, but of finding cases that are similar enough. To argue that some world is in the quantificational domain of the modal, it is not really necessary to say that it is amongst the most similar worlds in which the antecedent is true. Rather, it is necessary to say that it is similar enough (in the past) to count as a relevant case. This shift is not

going to solve all the puzzles raised by the way we figure out similarity, but it gives us a little more flexibility, and results in an insightful approach.

In this section I will discuss some of the parameters that affect our judgments of similarity, putting emphasis on the role of the past. The objective is to gain a better understanding of how we find counterparts of the actual world past in other worlds. I will show that we do not seek to blindly match the actual world past. The nature of the claim made by the consequent clause actually affects the way we figure out counterpart relations (this raises many issues regarding the notion of causation, that I will not be able to deal with). I will begin by presenting Lewis's discussion of constraints on the similarity relation [§5.1]. I will then discuss an objection raised by Slote (1978) and present more examples that illustrate some of the peculiar features of the relevant notion of similarity [§5.2, §5.3]. I will then argue for the sensitivity of the relevant notion of similarity to consequent clause [§5.4]. Finally, I will return to a temporal example, and show that the way we identify counterparts of the past in other worlds is actually affected by what we want to say [§5.5].

2.5.1 Lewis's constraints

According to Lewis, the notion of similarity relevant to the evaluation of counterfactuals is subject to several constraints. These constraints are operative in determining which worlds make up the quantificational domain of the modal:

- (28) (1) It is of first importance to avoid big, widespread, diverse violations of the law.
- (2) It is of the second importance to maximize the spatio-temporal region throughout which perfect match of particular fact prevails.
- (3) It is of the third importance to avoid even small, localized, simple violations of the law.
- (4) It is of little or no importance to secure approximate similarity of particular fact, even in matters that concern us greatly.

(Lewis 1979, quoted from Lewis 1986: 48)

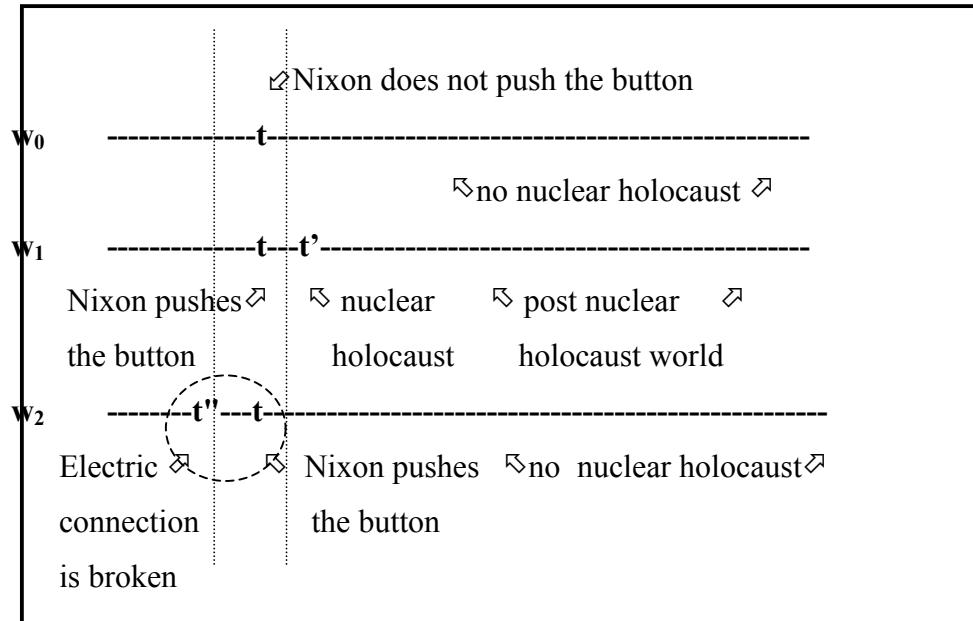
The constraints do not single out the past as having special importance. However, the interaction between the constraints is such that, when evaluating a counterfactual conditional in the actual world, the worlds quantified over by the modal end up being similar to the actual world in the past. Of particular interest to us is constraint number 2, which plays a crucial role in Lewis's rebuttal of Fine's counterexample. Let's see how it works. Consider Fine's example again:

- (1) If Nixon had pushed the button, there would have been a nuclear holocaust.

As Fine pointed out, worlds in which somebody cut the cable seconds before Nixon pushed the button and in which there is no nuclear holocaust appear, intuitively, more similar to the actual world than worlds in which the cable remained intact and there was a nuclear holocaust. How are such worlds kept out of the quantificational domain of the modal?

According to Lewis's constraints, the similarity relation favors spatio-temporal match with the actual world. The quantificational domain of the modal is made up of the worlds in which there is a maximum of spatio-temporal match with the actual world (in subordination to the first constraint). Worlds that differ from the actual world in that somebody cut the cable before Nixon pushed the button have a smaller extension of spatio-temporal match than worlds in which nobody cut the cable and Nixon pushed the button. The worlds in which the cable has been cut differ from the actual world at an earlier stage (see circle in picture below):

(29)



Of course, the worlds in which the cable was cut are much more similar to the actual world in that there is no nuclear holocaust. Shouldn't that count for something? No, says Lewis. Things may be somewhat similar after the cable has been cut and Nixon has pushed the button, but they will never again perfectly match what is going on in the actual world (unless there is some enormous miracle and total reconvergence is achieved, which is ruled out by Constraint 1). But approximate similarity with the actual world does not count for much. So worlds in which the cable was cut before Nixon pushed the button are discarded from the domain of quantification of the modal because they are less similar than worlds in which the cable was not cut (the extent of spatio-temporal match is smaller). They do achieve greater approximate similarity after Nixon pushes the button, but that does not count for much.

The constraint to maximize spatio-temporal match plays a crucial role in Lewis's solution to the problems raised by Fine's example. The constraint seems to give us clear instructions on what should count as 'similarity in the past': the quantificational domain of the modal should be made up of worlds in which the past matches the actual world past as closely as possible. Which means that the past should match the actual world past for as long as possible.

There have been objections to Lewis's maximize-match constraint (Slote 1978, Bennett 1988). I will add to the concerns by arguing that the maximize match constraint

actually does not always give us the right results. The similarity relation at play in identifying counterparts of the actual world past in other worlds is not always subject to that constraint. To some degree, the requirement to maximize spatio-temporal match seems to depend on the consequent clause.

2.5.2 Things should happen as late as possible

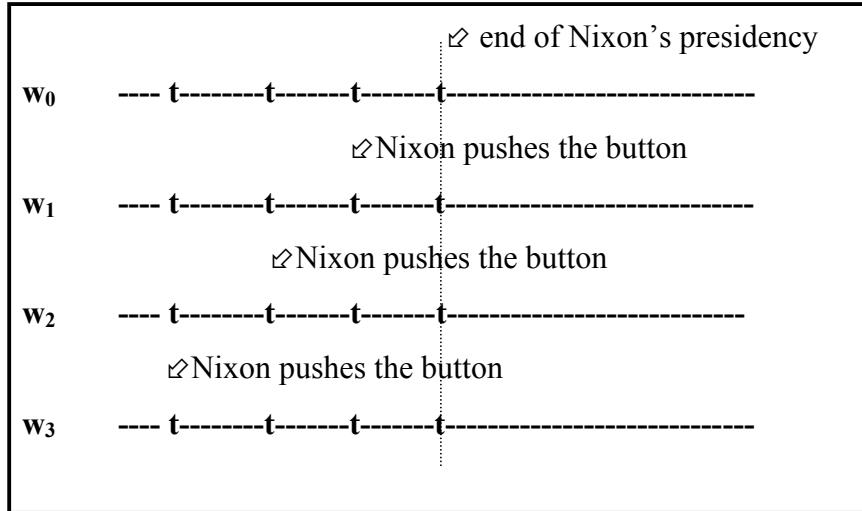
Slote (1978) raised an objection to Lewis's constraints. Following up on Slote's discussion, I will conclude that we do not always look for worlds in which the past perfectly matches the actual world past for as long as possible. The constraint to maximize spatio-temporal match does not operate blindly in looking for counterparts to the past in other worlds. The discussion of Slote's examples will be useful in making the point that we do not look for the most similar worlds that satisfy the antecedent, but only for those that are similar enough. We will see that the measure to which the similar-enough worlds match the actual world in the past can vary depending on the consequent.

Slote's objection to Lewis's constraints is that they appear to predict that divergence from the actual world history should take place as late as possible. To see why this is the case, let us go back to Nixon:

(30) If Nixon had pushed the button, it would have happened towards the end of his presidency.

According to Slote, the problem arising from the interaction of Lewis's constraints is that they predict that examples like (30) should be automatically true. This is because the drive to maximize spatio-temporal match will favor worlds in which divergence from actual world events happens as late as possible. The quantificational domain of the modal will be made up of worlds like w_1 , in which Nixon pushed the button towards the end of his presidency.

(31)



However, we do not judge examples like (30) trivially true. We seem to consider a range of possible times for the antecedent clause event. Intuitively, these are the times at which the event had a chance of occurring.

Examples like this suggest that we are not really interested in the most similar worlds, but rather in those that are similar enough. Faced with a world in which Nixon pushed the button on a Wednesday, we ask ourselves: is the past in this world similar enough to count as a counterpart of the past in the actual world? If the answer is 'yes', the world goes into the quantificational domain. Faced with a different world, in which Nixon pushed the button on a Thursday, we ask ourselves the same question. And again, if the answer is yes, we put the world in the quantificational domain. The example suggests that we are ready to set aside a fairly intuitive (and stricter) notion of similarity (one that prioritizes spatio-temporal match), and consider a range of alternatives that count as relevant.

Slote's example concerns event times, but the issues raised by the apparent disregard for obvious parameters of similarity are not restricted to temporal matters. Kratzer (1989) discussed an example that involves zebras:

(32) "Consider the following scenario: Last year, a zebra escaped from the Hamburg zoo. The escape was made possible by a forgetful keeper, who forgot to close the door of a compound containing zebras, giraffes, and gazelles. A zebra felt like

escaping and took off. The other animals preferred to stay in captivity. Suppose now counterfactually that some other animal had escaped instead. Would it be another zebra? Not necessarily. I think it might have been a giraffe or a gazelle. Yet if the similarity theory of counterfactuals were correct, we would expect that, everything else being equal, similarity with the animal that actually escaped should play a role in evaluating this particular piece of counterfactual reasoning. Given that all animals in the compound under consideration had an equal chance of escaping, the most similar worlds to our world in which a different animal escaped are likely to be worlds in which another zebra escaped. That is, on the similarity approach, the counterfactual expressed by (8) should be false in our world:

(8) If a different animal had escaped instead, it might have been a gazelle.

However, I don't think I would make a false claim if I uttered (8), given the circumstances described above. The fact that overall similarity with the actually escaped animal seems to be irrelevant in this case, suggests that the similarity involved in counterfactual reasoning is not our everyday notion of similarity. It must then be a very special sort of similarity. In fact, this has been the usual reaction to examples of this kind (Lewis 1979). "

(Kratzer 1989: 625-626)

As Kratzer's example shows, we do not care about similarity with the actual world escaped animal. When we make a hypothesis about an alternative escaped animal, all the alternative animals that had a chance to escape have to be considered in turn. In terms of the proposal I am sponsoring here, we would say that alternative pasts in which different animals escaped count as similar enough to be relevant.¹⁷

Nixon's example is similar to Kratzer's zebra case. In one case we consider a range of temporal settings for the event of Nixon pushing the button. In the other, we

consider a range of escaped animals. In both cases, we seem to be willing (obliged) to set aside some parameter of similarity in favor of considering a range of options. Why do we bother to consider a range of options? Why don't we narrow down the domain of quantification with a stricter notion of similarity?

It is tempting to think that the presence of an indefinite is important in Kratzer's zebra example. *A different animal* brings to mind a whole range of alternatives (a gazelle, a water buffalo, etc.). Should we be paying special attention to indefinite arguments?

The answer is 'yes, one should always pay attention to indefinites'. However, it seems to me that we do not want a theory that makes the presence of an indefinite argument a necessary condition for the drive to ensure that the quantificational domain of the modal include a range of alternatives in disregard of a stricter notion of similarity.¹⁸ The main reason for this comes from the behavior of *would*-conditionals that contemplate differences in the manner and place of events. While manner and place are easily discussed as parameters of events, they are not (according to the conventional wisdom) syntactically represented as arguments. If the presence of an indefinite arguments were crucial to the disregard for strict similarity, we would not expect *would*-conditionals about manner and place to invoke a wide range of alternatives. Yet, even in these cases, we tend to ignore strict similarity, and consider a range of alternative options. We will start by examining an example with manner:

¹⁷ Kratzer (1990) proposed an analysis to explain the zebra example, and others. Here, I will not be able to go into the consequences of Kratzer's proposal for the temporal cases I am exploring.

¹⁸ At times, actual world facts seem to impose themselves.. Suppose the zoo keeper left open an enclosure containing a zebra and a gazelle. The zebra escaped, but the gazelle stayed put. Suppose that the zoo contains also lions, hyenas and tigers, but the zoo keeper did not forget to lock any of their enclosures. Consider now the following dialogue:

A: Thank god that only a zebra escaped. If a different animal had escaped instead, people could have been attacked.

B: No, if a different animal had escaped instead, it would have been a gazelle. So, if a different animal had escaped instead, people would not have been attacked.

B's rejection of A's conditional rests on the rejection of the possibility that the zoo keeper could have forgotten to lock any other of the enclosures (which could be questioned!). Similarity with respect to the actual facts about the zoo keeper's forgetfulness overrides the possibility of contemplating all other zoo animals as alternatives.

(33) Jim and Jack danced very romantically all night. If Jim had danced with Joe, he would have danced very romantically too.

We do not judge (33) as trivially true. When we contemplate an alternative dancing event, with Jim and Joe as participants, we do not automatically assume that the manner of the dance is the same as the manner of the actual world dance. Just because Jim danced romantically with one person in the actual world, it doesn't mean he would have danced romantically with anybody else. (Of course, we may judge (33) true in case Jim always dances romantically, or was determined to dance romantically on that evening, or something like that.)

From the example in (33) we see that the similarity requirement is not necessarily sensitive to the manner of the event. On the contrary, we are required to consider a range of manners. Yet, presumably, there is no indefinite manner argument.

We turn now to place. Again, Jim is dancing:

(34) Jim has spent the evening dancing with Jack by the fireplace. If Jim had danced with Joe, he would have danced by the fireplace (too).

The counterfactual in (34) may or may not be true. It definitely doesn't follow simply from the fact that Jim danced with Jack by the fireplace. The domain of quantification of the modal is not made up of worlds in which the dancing takes place in the same place as in the actual world. Similarity with respect to place doesn't seem to be relevant. Yet, again, we may feel some reluctance to conclude that there is a place argument saturated by a non-overt place indefinite.

The conclusion is that domain of quantification of the modal includes a range of possibilities that are similar enough to count as relevant alternatives to the actual world. In our terms, their past is similar enough to the actual world to count. The required diversity does not depend on the presence of indefinites in the antecedent clause. The proposal to identify the domain of quantification of the modal in terms of worlds that include a counterpart of the actual world past helps understand why the quantificational

domain is not restricted to the most similar worlds in which the antecedent is true (in a narrow sense), but rather, includes all worlds that are similar enough.

2.5.3 Claims vs. assumptions

In this section I will discuss some examples that show there is a difference between the claims we are prepared to accept as true and the assumptions we are willing to play long with. This is a corollary to the discussion above, and will become relevant again in the next chapter.

In our discussion so far, we have considered examples in which the consequent draws an inference about the kinds of participants, place, time or manner of an event. We came to the conclusion that similarity with respect to such parameters does not decisively determine what counts as a relevant option. Possibilities that differ from what has actually happened with respect to the participants, time, place or manner of an event can still be similar enough to count, and end up in the quantificational domain of the modal. In this section we will see that if that similarity may be more decisive if it is assumed instead of asserted. Consider a place example:

(35) Suppose Jim has spent the evening dancing with Jack by the fireplace. We speculate on what would have happened if instead Jim had danced with Joe (he is allergic to smoke).

If Jim had danced with Joe instead, Joe would have complained about the smoke.

We may be willing to judge (35) true simply because Joe is allergic to smoke. This judgment reflects an interpretation according to which the domain of quantification of the modal is made up of worlds in which the alternative dancing also takes place by the fireplace. In this case, the similarity requirement is sensitive to the actual world location of the dancing event. In considering alternative scenarios in which the dancing took place with somebody else, the location of the dance is kept the same as in the actual world. (Contrast (35) with (34)).

It is interesting to note that similarity with respect to the location of the dance can easily be over-ridden:

(36) A: It's a good thing that Jim danced with Jack. If he had danced with Joe instead, Joe would have complained about the smoke.

B: No, if Jim had danced with Joe, he wouldn't have danced by the fireplace. So, if Jim had danced with Joe, Joe wouldn't have complained about the smoke.

The same trick we have played with the location of the event can be played with the manner. Consider the examples in (37):

(37) Jim is slow dancing with his sister. Present at the party is also Joe, Jim's ex, and Jack, Jim's current interest.

A: It is a good thing Jim is dancing with his sister. If he had been dancing with Joe, Jack would have been jealous.

B: No, if Jim had been dancing with Joe, he wouldn't have been dancing like that. So, even if Jim had been dancing with Joe, Jack wouldn't have been jealous.

The examples in this section show that we are prepared to accommodate similarity of place and manner as an assumption. If the consequent is such that the conditional would only be true if such similarity were respected, we may be willing to play along and grant it. However, actual world facts could compel us to cancel the assumption.

2.5.4 A non-temporal example

In this section I will discuss an example that shows that the similarity relation that determines which worlds include a counterpart of the past is affected by the claim made

by the consequent. Although my example here is not a strictly speaking a temporal example, the same point will be made in the next section with respect to time.

Consider (38):

(38) If Susan hadn't been born, the world would be a better place.

The example doesn't speak well of Susan. It tells us that, for whatever it is that makes the world good, the balance would be more positive if Susan were absent.

The extent of the claim made by an utterance of (38) depends on the types of Susan-less worlds that are quantified over. There are many worlds that differ from the actual world in which Susan wasn't born. They may be worlds in which:

- plagues destroyed humanity in the Middle Ages
- Susan's parents didn't have sex that night, or they had sex but no conception took place
- Susan's parents never met
- Susan's mom died during pregnancy
- Susan's mom had a miscarriage
- Susan's mom had an abortion
- instead of sperm 23, it was sperm 24 that met the egg, and a different little girl was born, Mary, who was nicer than Susan
- instead of sperm 23, it was sperm 25 that met the egg, and a different little girl was born, Katy, who was worse than Susan
- Susan's parents didn't have sex that night, or they had sex but no conception took place. Susan's mom had been really hoping to get pregnant that night, and her disappointment was so bad that she poisoned the water supply of her town, killing thousands.

Some kinds of worlds are irrelevant when we judge (38) true. Worlds where plagues destroyed humanity don't appear to count. The standard Lewis-Stalnaker analysis rules them out because they are 'too far out', too different from the actual world to count as

members of the set made up of the 'most similar worlds' in which the antecedent is true. In terms of the proposal here, we would say that the past in such worlds does not count as a counterpart of the actual world past, so the worlds do not enter the quantificational domain of the modal.

When we judge (38) true, we are usually thinking of worlds that are very much like the actual world, except that maybe Susan's parents didn't have sex, or there was no conception, or they had a child with different properties (Mary). Any such worlds would intuitively count as relevant antecedent worlds. In a sense, we don't really choose whether it was the case that Susan's parents didn't have sex, or there was simply no conception, or whether they had a slightly different child instead, who was nicer. Any of these intuitively count as antecedent worlds, suggesting that the past in these worlds is similar enough to count as a counterpart of the actual world past.

We can access intuitions about what sort of differences are contextually relevant by putting (38) in a discourse:

(39) Oh! I wish Susan's parents hadn't had sex that night! If Susan hadn't been born, the world would be a better place.

Or:

(40) Oh! I wish Susan's parents had had a different child! If Susan hadn't been born, the world would be a better place.

Or, rather artificially:

(41) Oh! I wish Susan's parents hadn't had sex that night, or that there had been no conception, or that a different child had been born, or If Susan hadn't been born, the world would be a better place.

The contexts help us see what kinds of differences we are willing to tolerate when we judge (38). Some options are unreasonable (and make for 'bad' discourses):

(42) Oh! I wish humanity had been destroyed by a plague in the Middle Ages. If Susan hadn't been born, the world would be a better place.

About some cases, our intuitions are a little vague. What about the possibility that Susan's parents didn't meet? Is the past in such worlds a counterpart of the actual world past? Are such worlds in the quantificational domain of the modal?

(43) Oh! I wish Susan's parents hadn't met. If Susan hadn't been born, the world would be a better place.

Our intuitions about (43) seem to depend on what else is going on. Suppose that Susan is actually an only child. Imagine now worlds that are like the actual world in the past but differ minimally in that Susan's parents didn't meet, and Susan wasn't born. If the similarity relation that identifies past counterparts tells us that the past in those worlds is similar enough to count as a counterpart, those worlds will be in the quantificational domain of the modal. In the situation described above, where Susan is an only child, this seems a reasonable way of departing from the actual world, and we would probably be willing to accept (43).

Suppose now that Susan is one of many children, and that her brothers and sisters have actively bettered the lot of humanity. In these circumstances, if the quantificational domain included worlds in which Susan's parents did not meet, an utterance of (38) would probably result in a false statement. However, in these circumstances, the similarity relation would probably not output such a domain. We would probably resolve (38) according to a different similarity relation than the one described in the previous scenario. And we would surely judge (43) false. We could judge (38) true and disagree with (43) if the similarity relation picked cases in which Susan's parents didn't have sex that night, or they had a different child, etc. but set aside worlds in which they didn't meet.

The example and scenarios discussed above suggest that the similarity relation that identifies past counterparts is sensitive to the claim made by the consequent. Let's

look at another scenario. Consider worlds in which the past is similar to the actual world past except that Susan's mom chose to have an abortion, and worlds with similar pasts in which she had a miscarriage. Are these worlds relevant antecedent worlds when we evaluate (38)? Is the past in these worlds similar enough to count as a counterpart of the actual world past?

The answer depends on how the abortion and miscarriage have affected the balance of goodness, and how evil we consider Susan to be. Suppose that, in the most similar miscarriage worlds, Susan's mom was terribly upset and suffered greatly all her life. It could be the case that the miscarriage adds to the sadness in the world to a greater degree than an abortion does. Consequently, we might be willing to accept the (crude) discourse in (44) but not the (crude) discourse in (45):

(44) Oh! I wish Susan's mother had had an abortion. If Susan hadn't been born, the world would be a better place.

(45) Oh! I wish Susan's mother had had a miscarriage. If Susan hadn't been born, the world would be a better place.

Could 'naïve' similarity explain why we would accept abortion worlds as antecedent worlds for (38), but not miscarriage worlds? It doesn't seem very likely. Let's push the issue. Suppose that in the abortion worlds under consideration, Susan's mom had an abortion at home. She drank a special herb-tea that she knew would cause her to lose the fetus. Suppose that in the miscarriage worlds, the miscarriage came about because Susan's mom accidentally drank that tea. She thought it was ordinary tea. What notion of similarity could distinguish between these cases?

There is an obvious sense in which the two kinds of worlds are very similar. But they are also different in many ways. In the abortion worlds, Susan's mom wanted to lose the fetus. In the miscarriage worlds, she didn't. From the perspective of the desires of Susan's mom, the miscarriage worlds appear more similar to the actual world than the abortion worlds (let's agree that in the actual world, Susan's mom did not wish to lose the fetus). If similarity with respect to the desire to lose the fetus were relevant in identifying

past-counterparts, worlds in which Susan's mother had a miscarriage would be relevant antecedent worlds, whereas worlds in which Susan's mom had an abortion wouldn't be. But our intuitions do not coincide with this, suggesting that similarity with respect to the desire to lose the fetus is not relevant in finding past counterparts.

Let us turn to another difference between the abortion worlds and miscarriage worlds. In the miscarriage worlds, Susan's mom is sadder than in the abortion worlds. In the miscarriage worlds, the emotional state of Susan's mom adds to the amount of bad/sad things. This does not happen in the abortion worlds, nor in the actual world. The similarity relation appears to pay attention to this. The worlds in which Susan's mom gets sadder do not enter into the quantificational domain of the modal. So, it seems that the way we identify past-counterparts is sensitive to the claim made by the consequent clause: the consequent claim is about amounts of badness/sadness in the world, and the similarity relation favors worlds in which the contribution to sadness/badness made by individuals other than Susan are the same as in the actual world.

The examples make a general point indicating that the way we identify the quantificational domain of the modal is sensitive to the claim made by the consequent clause. In the next section we will see that this also applies to the degree of spatio-temporal match in the past: the extent to which we keep the past the same when identifying the quantificational domain of the modal depends, to some extent, on the consequent clause.

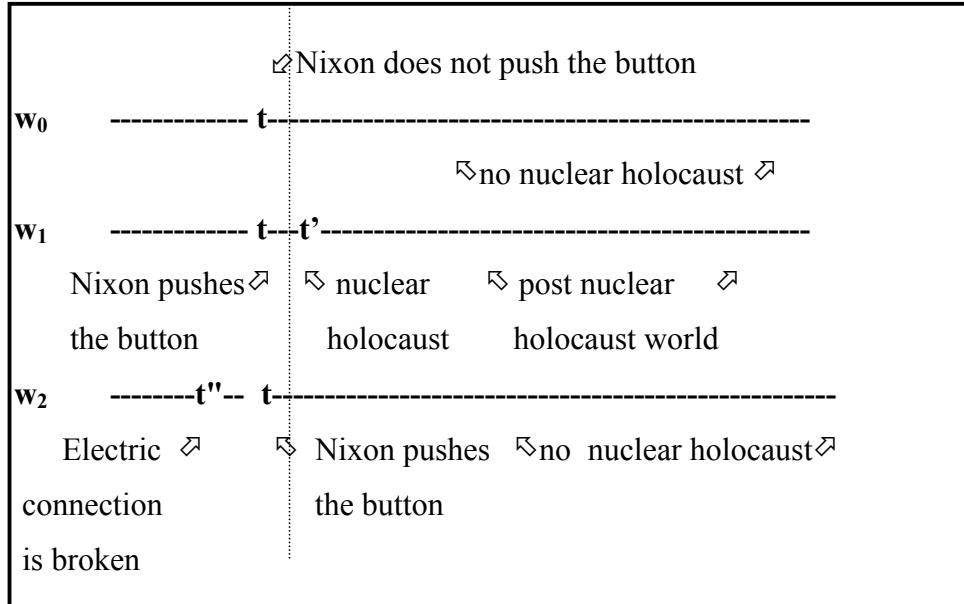
2.5.5 Differences in the past

Let us go back to Fine's Nixon example:

- (1) If Nixon had pushed the button, there would have been a nuclear holocaust.

Lewis's constraints on the similarity relation ensure that worlds like w_2 in (15) do not make it into the quantificational domain of the modal.

(15)



However, we have seen from the discussion of Slote's examples that a constraint that simply pushes divergence as late as possible is not necessarily a good idea. Moreover, we have seen from the discussion in the previous section that the similarity relation that identifies the quantificational domain of the modal appears to be sensitive to the choice of consequent. In this section I will make the point that the choice of consequent can indeed affect whether we tolerate early divergence in the past or not.

Part of the point has already been made. When discussing the conditional in (38) *If Susan hadn't been born, the world would be a better place*, we included within the domain of quantification of the modal both worlds in which Susan's parents did not meet and worlds in which they met but Susan was not conceived, etc. So we have already discussed cases of 'early divergence'. In this section I will turn to a last example. Consider (46), in comparison with (1):

(1) If Nixon had pushed the button, there would have been a nuclear holocaust.
(46) If Nixon had pushed the button, he would have been a bastard.

Let us grant that we judge both conditionals true. What kinds of possibilities are relevant? Are we quantifying over the same possible worlds in both conditionals? Consider the following possibilities:

- * In worlds like w5, Nixon pushed the button accidentally and the cable was fully functional
- * In worlds like w6, Nixon pushed the button on purpose and the cable was fully functional
- * In worlds like w7, Nixon pushed the button accidentally and somebody had cut the cable
- * In worlds like w8, Nixon pushed the button on purpose and somebody had cut the cable.

Are worlds like w5-w8 similar enough to the actual world in the past to count as worlds in which Nixon pushed the button in (1) and (46)? That is, are worlds like these in the quantificational domain of the modal in both conditionals?

Our intuitions tell us that the choice of consequent matters. As far as (1) is concerned, it doesn't matter whether Nixon pushed the button accidentally or on purpose. But it does matter that nobody cut the cable. When we judge (1) true, we include in the quantificational domain of the modal worlds like w5 and w6, but not worlds like w7 and w8.

The example in (46) is different. We would consider Nixon to have been a bastard if he had decided to start a nuclear war. When we judge (46) true, it is Nixon's decision to push the button that makes him a bastard. Whether somebody cut the cables before he pushed the button doesn't matter. Both worlds like w6 and w8 will end up in the quantificational domain of the modal. And we will ignore the possibility that he might have pushed the button accidentally.¹⁹

¹⁹ Unless somebody draws our attention to it:

A: If Nixon had pushed the button, he would have been a bastard.
B: Not really, he was so clumsy. He might have pushed the button accidentally.

We can track our assumptions about the make-up of the modal's quantification domain by looking at examples in which speakers appear to contradict each other. Consider the dialogues below:

(47) A: If Nixon had pushed the button, there would have been a nuclear holocaust.

B: No, no. Didn't you hear? Somebody cut the cable.

(48) A: If Nixon had pushed the button, he would have been a bastard.

B: #No, no. Didn't you hear? Somebody cut the cable.

B's statement appears to contradict A in (47), but not in (48). B's statement in (48) is somehow deviant. We can explain the contrast as follows: in (47), A assumes that the domain of quantification is made up of worlds that are like the actual world in the past with respect to the status of the cable, and believes that the cable has not been cut. B points out that A is making a mistake about the status of the cables in the actual world, and given similarity with respect to the actual world status of the cable, A's statement is false. B's response in (48) is deviant because the status of the cable is irrelevant to the truth of A's claim. Nixon is considered a bastard because of his decision to push the button. The quantificational domain of the conditional in (48A) can be taken to include worlds in which somebody cut the cable before Nixon pushed the button (as long as Nixon didn't know). B's statement does not contradict A's claim, and the deviance arises because it is strange that B appears to think it does.

2.5.6 Conclusion

The main goal of this chapter is to provide an account of the interpretation of past tense in *would*-conditionals. I have argued in favor of thinking of *would*-conditionals as *de re* claims about the past. This perspective provides us with a fairly intuitive way of understanding the role of the past tense and the importance of past events. Incorporating modal talk of *aboutness*, we can make relevant the counterpart machinery designed by Lewis to make sense of trans-world identity of individuals. The notion of counterpart

gives us the flexibility we need to understand the role of the past in identifying the quantificational domain of the modal.

It is worth saying something about my commitment to Lewis's theory of individuals and possible worlds. I have proposed that we think of individuals and possible worlds in a Lewis-style framework. However, many people find the basic assumptions in Lewis's metaphysics untenable (for example, the idea that all possible worlds exist in the same way that the actual world exists is felt by some to be unintuitive). So, it is worth asking: is the proposed analysis actually dependent on Lewis's metaphysics? The answer is that the analysis is not necessarily tied to Lewis's metaphysics. One can defend a semantics of *de re* modal claims based on counterparts even rejecting Lewis's views about the metaphysics of possible worlds. The notion of counterpart is useful in understanding modal claims independently of what we think about the constitution of possible worlds. So, my analysis does not fall (or rise) with Lewis's metaphysics.

In this chapter I have argued that the criteria for identifying counterparts of the actual world past in other worlds depends on the claim made by the conditional. If we are concerned about whether there would have been a nuclear holocaust or not, we are not willing to consider worlds in which somebody cut the relevant cables before Nixon pushed the button. If we only care about Nixon's moral character, such worlds could end up in the quantificational domain of the modal. It is clear that we do not tolerate arbitrary early divergences with respect to things that matter, but we are more flexible with things that do not matter. The notion of causality is looming in the background. But a theory of what kinds of things matter, given the claim made by the consequent clause, is beyond the scope of this work.

2.6 The role of past tense: what do others think

The relation between *would*-conditionals and past morphology has been noted by other authors. Here I will briefly discuss the proposals made by Iatridou (2000) and Condoravdi (2001). Both authors have taken seriously the idea that there is real past morphology in *would*-conditionals. In Chapter 4 I will turn to the related proposal found in Ippolito (2003).

2.6.1 The past as exclusion: Iatridou (2000)

Iatridou 2000 investigates the interpretation of past tense morphology in counterfactual contexts. According to Iatridou, the information provided by tense morphology varies depending on the context. In some cases tense provides information about the temporal location of eventualities, and in others it provides information about the world-location of eventualities. Iatridou's proposal seeks to derive this variation on the basis of a single vague meaning in interaction with distinct domains of interpretation (times vs. worlds).

Iatridou's proposal falls within a tradition of work that has tried to link our intuitions about the 'distance' of past times to the 'distance' of other worlds. Palmer 1986, commenting on the cross-linguistically robust relation between past tense and mood, was not very hopeful:

(49) *The relation between past and unreality has often been noted, but the explanations seem to be largely circular. Joos (1964: 121-2), for instance, suggests that the essential common feature is remoteness, in time or reality. Similarly, James (1982: 396) speaks of 'remoteness from reality' and Langacker (1978: 855) uses the label 'distal'. But this may be no more than giving a single label to two quite different meanings, and so be uninformative. Steele (1975: 217), too, argues for the 'semantic primitive of disassociative', past time being disassociated from present time and unreality from reality. However, the problem remains.*

(Palmer 1986: 211)

By presenting tense data from different languages, Iatridou supports the view that the presence of a past tense in English *would*-conditionals cannot be discarded as an accident of mood agreement morphology.

2.6.1.1 The proposal

Iatridou 2000 presents an analysis of past tense morphology in various kinds of 'counterfactual constructions', concentrating on conditionals. Although the majority of

Iatridou's data comes from Modern Greek, Iatridou points out that past tense morphology (with or without accompanying subjunctive morphology) is found in counterfactual conditionals in numerous languages²⁰. Her proposal should be considered a general proposal for the non-standard interpretation of past tense morphology in 'counterfactual' contexts.

Past counterfactuals in Modern Greek (like in English) have past perfect morphology in the antecedent clause:

(50) An iχ₁e pari to siropi θa iχ₁e γ₁ni kala
 if had taken the syrup FUT had become better
'If he had taken the syrup, he would have gotten better' (Iatridou 2000:233)

The sentence in (50) is a past counterfactual, and has as part of its meaning that the speaker believes that the patient has not taken the syrup at some time in the past. The following two conditionals do not have this meaning:

(51) An pari afto to siropi θa γ₁ni kala
 if take/NPST/PRF this syrup FUT become/NPST/PRF well
'If he takes this syrup, he will get better'

(52) An eperne afto to siropi θa γ₁notan kala
 if take/PAST/IMPRF this syrup FUT become/PST/IMPRF well
'If he took this syrup, he would get better' (Iatridou 2000: 234)

Both (51) and (52) are 'realizable' (they could still 'happen'). The sentences could, for example, be used as instructions to a patient's caretaker. The difference between the choice of a non-past perfective (51) or a past imperfective (52) has to do with how likely the speaker considers the antecedent to be. A speaker would choose (52) over (51) if she believed that it was unlikely that the patient would take the syrup.

²⁰ see Newton (1979), who argues that imperfect appears in general in cases of 'binding' by temporal adverbs, modals, etc.

Iatridou calls conditionals about the future with past imperfective morphology *Future less vivid conditionals* (FLV), and informally characterizes them as in (53):

(53) *Future less vivid conditionals*

Assertion: a standard semantics for neutral conditionals (like (17)) ‘if p, q ’

Implicature: the actual world is more likely to become a non- p world than a p -world. (Iatridou 2000: 234)

The task is to explain the relation between tense (and aspect) morphology and the counterfactual meaning. Iatridou’s strategy is to propose a basic meaning for the interpretation of past tense, and explain variations in the interpretation as corresponding with variations in the domain of application of the basic meaning. Iatridou proposes to interpret the past tense morpheme as providing a ‘skeletal meaning’ of the form in (54):

(54) $T(x)$ excludes $C(x)$

(Iatridou 2000: 246)

‘ $T(x)$ ’ stands for the topic, *the x that we are talking about*, and ‘ $C(x)$ ’ stands for *the x that for all we know is the x of the speaker*. The basic meaning of the past tense morpheme is one of ‘exclusion’: the x that we are talking about excludes the x that for all we know is the x of the speaker. As we’ll see below, this meaning can be applied to different domains. Iatridou claims that, applied to the domain of tense, it results in a past tense interpretation, and applied to the domain of modality, it results in a counterfactually-flavored interpretation.

When we apply (54) to the domain of tense, we obtain something like (55):

(55) The topic time excludes the utterance time.

Under the assumption that tense proper can only be past or present (Iatridou considers that the future is modal), and that the speaker is to be found in the present, Iatridou claims

that (55) derives the past tense interpretation of past tense morphology. By excluding the present, we are left with the past.

When we apply (54) to possible worlds (modality), we obtain something like (56):

(56) The topic worlds exclude the actual world.

The claim in (56) does not, strictly speaking, derive counterfactuality. According to Iatridou, the counterfactual flavor associated with past imperfect conditionals is an implicature (and as such, it can be cancelled).²¹ Suppose that we are talking about worlds where the proposition *p* is true. The use of a past imperfect requires that the *p*-worlds that we are talking about not include the actual world. It does not require that the *p*-worlds *simpliciter* not include the actual world.

2.6.1.2 Discussion

Iatridou's proposal has the advantage of seeking to provide a unified account of the interpretation of tense morphology. Her paper provides evidence from a wide variety of unrelated languages suggesting that past tense and imperfective aspect do have an important role to play in 'counterfactual' contexts (both conditionals and *wish*-type verbs).

However, it is difficult to evaluate the full contribution of Iatridou's ideas in the absence of concrete assumptions regarding the overall composition of the interpretation of the sentences. For example, it is unclear why a modal interpretation arises in a restricted set of contexts (i.e. in the presence of modals or *wish*-type verbs), or why tense morphology seems to impose a restriction on temporal variables at times, and on world variables at other times.

²¹ "It has often been argued that the counterfactuality of conditionals is conversationally implicated and not asserted. (...) We can cancel the counterfactuality without producing a contradiction.

2.6.2 Past possibilities: Condoravdi (2001)

Condoravdi 2001 defends a proposal according to which ‘counterfactual’ possibilities are possibilities ‘in the past’. The proposal is very carefully worked out, and is based on the strong intuition that counterfactual possibilities are possibilities that are not currently available, but once were. I cannot do justice to the details and subtlety of Condoravdi’s proposal here. I will focus on the issue of the relative scope between HAVE and modals. The reader is referred to Condoravdi’s work for an important discussion about the structure of possibilities.

Condoravdi (2001) does not put forward a theory of the interpretation of conditionals. The proposal is designed to explain the interpretation of plain modals (i.e. modals in simple sentences, not in conditionals). However, it seems promising to think that it could be extended to deal with conditionals, and in my discussion I will present one way of doing that.

2.6.2.1 The proposal

Condoravdi is interested in providing an account of what she calls epistemic and counterfactual readings of modals in combination with *have*. Her proposal is made for both *will/would* and *might (may)*, but she exemplifies it with *might*. The proposal seeks to explain data like the following:

(57) a. He might have won the game. (Condoravdi 2001: 4)
b. He might have won the game. However, he didn’t.
c. He might have won the game. We’ll soon find out.

Condoravdi argues that *might* in combination with a perfect (57a) is ambiguous. It can receive a *counterfactual* interpretation, or an *epistemic* interpretation. The interpretations are teased apart in (57b) and (57c) respectively. Condoravdi characterizes the counterfactual interpretation as claiming that some possibility was available in the past,

(i) If the patient had the measles, he would have exactly the symptoms he has now. We conclude, therefore, that the patient has the measles.” (Iatridou 2000: 232, adapted from Anderson 1951)

and the epistemic interpretation as claiming that according to what we know now, something (may have) happened in the past.

Condoravdi's goal is to derive the interpretations in a compositional manner from the semantics of the modal and the perfect. According to Condoravdi, the perfect may scope above or below the modal, and the different scope options correlate with different types of modal interpretation (*metaphysical modality*, for the counterfactual interpretation, or *epistemic modality*). When the perfect scopes below the modal, only an epistemic interpretation is available. When the perfect scopes above the modal, both an epistemic and metaphysical interpretation are available. The relation between the relative scope of the perfect and modal and the type of modality is not hardwired into the semantics, but follows from assumptions about the structures of possibilities and felicity conditions (this is carefully worked out in Condoravdi's proposal, but I will not say much about it here).

I will begin by spelling out the truth conditions proposed by Condoravdi for the different scope options. In the epistemic interpretation, the modal takes scope over the perfect. Condoravdi proposes the representation in (58):²²

(58) PRES(MAY_{MB} (PERF(he win the game)))

Given Condoravdi's treatment of modals and the perfect, the representation in (57) will obtain the truth conditions in (59):

(59) $\lambda w \exists w' \exists t' [w' \in MB(w, \text{now}) \ \& \ t' < (\text{now}, _) \ \& \ \exists e [[\text{he win}](w')(e) \ \& \ \tau(e, w') \subseteq t']]$

Let us clarify the different parts of (59). $MB(w, \text{now})$ is the set of worlds corresponding to the modal base associated with the evaluation world at the speech time. The modal base determines the set of worlds that is accessible for quantification. Quantification over the worlds in the modal base is existential because we are dealing

²² MB makes reference to the Modal Base associated with the modal, which determines the type of modality.

with the existential modal *might*. $\exists e [[he\ win](w')](e)$ indicates that we are interested in a world in which there is an event of his winning, and $t' < (now, _)$ together with $\tau(e, w') \subseteq t'$ indicate that the event has a running time within an interval that is past with respect to the speech time. According to (59), (58) denotes the proposition that is true in a world iff some world in the modal base available in that world at the speech time contains an event of his winning with a running time before the speech time.

In the counterfactual interpretation, the perfect takes scope over the modal. Condoravdi proposes the representation in (60):

$$(60) \quad \text{PRES(PERF(MAY}_{\text{MB}}(\text{ he win the game))))$$

The representation in (60) is given the truth conditions in (61):

$$(61) \quad \lambda w \exists w' \exists t' [t' < \text{now} \ \& \ w' \in \text{MB} (w, t') \ \& \ \exists e [[he\ win](w')](e) \ \& \ \tau(e, w') \subseteq [t', _]]]$$

According to (61), (60) denotes the proposition that is true in a world iff some world in the modal base available in that world at some past time includes an event of his winning that has a running time included in the interval that begins at that past time and extends into the future.

As we have seen, the different scope options for the modals correlate with a difference in the type of modality expressed by the modal. This is not something that is hard-wired into the truth conditions for the sentence. Condoravdi argues that it follows from general properties of the structures of possibilities and felicity conditions on the association between modals and modal bases.

2.6.2.2 Supporting evidence from adverbs and other languages

Condoravdi supports her decompositional account of epistemic and metaphysical interpretations of *might have* with data from adverbs. She provides data from *already*, *still*, and *yet*. Condoravdi also draws on evidence from German, a language that she claims disambiguates scope relations at surface structure. In this section I will review her

argument, focusing mostly on the adverb *already*. I will also introduce data from Spanish, in an attempt to show that the cross-linguistic picture is actually more complicated than one might have hoped.

Condoravdi begins by pointing out that the adverb *already* is incompatible with eventive predicates,²³ but it is compatible with perfects. Examples are provided in (62):

(62) a. He (?*already) returned.
b. He has already returned. (Condoravdi 2001: 8)

The contrast in (62) can be explained by saying that *already* cannot felicitously scope over an eventive predicate, but that it can scope over a perfect. The scope relations in (62) would be as in (63):

(63) a. *He already returned.
*ALREADY (he returned)
b. He has already returned.
ALREADY (PERFECT(he returned))

The example in (64) shows that *already* cannot scope over the modal *might/may*:

(64) *He may already win. (Condoravdi 2001: 18)

The examples in (65) illustrate that *already* is felicitous with an eventive verb when there is both a modal and perfect:

(65) a. He must/should/might/may have already returned.
b. He must/should/might/may (*already) return.
(Condoravdi 2001: 8)

²³ My informants do not actually agree with this judgment, which might be the reason why they accept examples that argue against Condoravdi's point.

Given the previous examples, Condoravdi's conclusion is that in cases like (65a) the relative scope of the modal, adverb and perfect is as in (66):

(66) MODAL(ALREADY(PERFECT(*he return*)))

Given the relative scope of the modal and perfect, the proposal in (66) predicts that *already* should be compatible only with an epistemic interpretation, not with a counterfactual interpretation (remember that the counterfactual interpretation arises when the perfect scopes over the modal).

Condoravdi provides data from German to support her view. She notes that in German the relative scope of the modal and perfect can vary overtly:²⁴

(67) a. Er könnte (*schon*) gewonnen haben.
 he could already won have
'He might have (already) won.'

b. *Er hätte schon gewinnen können.
 he had already won could
'He might have already won' (Condoravdi 2001: 18)

According to Condoravdi, (67a) has only an epistemic reading. This is a case in which the modal scopes over the perfect, and the adverb *schon* (*already*) scopes in between. A sentence like (67b), in which the perfect scopes over the modal does not allow for *schon*. German thus provides supporting evidence for Condoravdi's claim that the counterfactual interpretation is available when the perfect scopes over the modal.

To get a better picture of the full force of Condoravdi's adverb argument, let us say a few words about *still*. *Still* is like *already* in that it does not combine with eventive predicates. But it differs from *already* in that it can scope over a modal:

(68) He may still win. (Condoravdi 2001: 18)

²⁴ Angelika Kratzer (p.c.) notes that (67b) is indeed ungrammatical if *schon* is interpreted as *already*, but it is grammatical if it is interpreted as an emphatic discourse particle.

Still also differs from *already* in that it does not scope over the perfect. This is illustrated by the contrast in (69):

(69) a. He has already won.
 b. *He has still won. (Condoravdi 2001: 19)

Given all these differences between *still* and *already*, we might expect a difference in the behaviour of German *still* (*noch*) and German *already* (*schon*) [other things being equal]. The data provided by Condoravdi bear out this prediction:²⁵

(70) a. Er hätte (noch) gewinnen können.
 he had still won could
'He might (still) have won.'
 b. *Er könnte noch gewonnen haben.
 he could still won have
'He might still have won' (Condoravdi 2001: 18)

The sentence in (70a) allows only for a counterfactual reading. This is expected given that the perfect scopes over the modal. *Noch* scopes in between (remember that *still/noch* can scope over a modal but cannot scope over a perfect). When the scope is reversed, as in (70b), *noch* is not possible.

2.6.3 An extension of Condoravdi's proposal

Condoravdi (2001) does not analyze conditionals. However, her proposal about the interpretation of modals is very interesting, and it is worth thinking about what happens when we try to apply it as is to the case of *would*-conditionals. That is, should

²⁵ The example in (70b) is not ungrammatical. It is perfectly fine as an epistemic conditional. It simply cannot be counterfactual. (thanks to Angelika Kratzer for pointing this out).

we think of *would*-conditionals as an example of a modal that receives a counterfactual interpretation à la Condoravdi (2001)? Are they special simply in that there is an overt *if*-clause restricting the modal? I will argue that the answer is ‘no’. The counterfactual interpretation in conditionals does not arise by having the perfect scope over the modal.

Let me begin by describing what I think would be an intuitively straightforward way of extending Condoravdi’s proposal to the case of conditionals. We have seen that Condoravdi assigns the sentence in (71a) the logical form in (71b), with the truth conditions in (71c) [repeated from (60) and (61)]:

(71) a. He might have won the game.
b. PRES (PERF (MIGHT_{MB} (he win the game)))
c. $\lambda w \exists w' \exists t' [t' < \text{now} \ \& \ w' \in \text{MB} (w, t')] \ \&$
 $\exists e [[\text{he win}](w')(e) \ \& \ \tau(e, w') \subseteq [t', __]]$

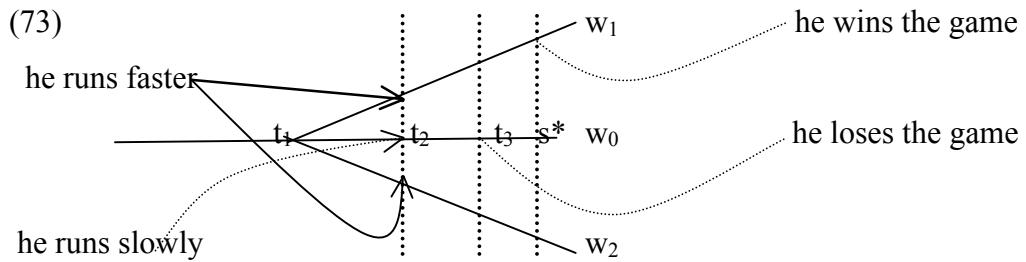
When the perfect takes scope over the modal, the sentence is true if some world in the set of worlds that are like the actual world up to some past time is such that he wins the game after that past time.

I am contemplating a simple extension to the case of conditionals, that keeps the ingredients of Condoravdi’s account and allows the modal to be restricted by the *if*-clause. Under this extension, the sentence in (72a) would obtain the truth conditions in (72c):

(72) a. If he had ran faster, he might have won the game.
b. PRES (PERF (MIGHT_{MB/he ran faster} (he win the game)))
c. $\lambda w \exists w' \exists t' [t' < \text{now} \ \& \ w' \in \text{MB/he ran faster} (w, t')] \ \&$
 $\exists e [[\text{he win}](w')(e) \ \& \ \tau(e, w') \subseteq [t', __]]$

Angelika Kratzer has also pointed out that (70b) would be acceptable in a scenario like the following: Everything is not lost yet. If they found out that Lance used drugs, it would still be possible for Paul to have won the race.

The modal base associated with the modal is restricted by the antecedent clause (MB/*he ran faster*). In the case of metaphysical modality, we could say that the modal base is made up of the worlds in which he runs faster than are like the evaluation world up to some past time and differ minimally from then on. The conditional will be true if amongst this set of worlds there is some in which he wins the game. The picture below is intended to clarify this point:



Before turning to issues about the adequacy of the truth conditions described above, let me say something about the requirement that the worlds quantified over differ minimally from the evaluation world. As we have seen in Chapter 1, similarity plays an important role in the Lewis-Stalnaker semantics for counterfactuals. In my simple extension of Condoravdi's proposal to the case of conditionals, I have incorporated similarity by claiming we only quantify over worlds that are like the actual world up to some past time and are then minimally different from the actual world (this view obviously recovers Lewis's intuitions in setting up the constraints in (28)).

It is worth noting that some context dependent parameter needs to be included even in the cases of simple modals discussed by Condoravdi. It is not an issue that arises exclusively with counterfactual conditionals. To see this, consider the (non-conditional) example in (74):

(74) She might have studied the piano.

Imagine (74) said of a musical person who has just suffered a serious accident, and will be unable to use her hands for the rest of her life. We could well judge it true. Imagine it

now said of a person who had the same accident but was also born with a hearing impairment. We would probably judge it false.

In the first case, we probably interpret the modal in (74) as quantifying over worlds that are like the actual world except for the fact that she did not have an accident (similar to the modal in *if she hadn't had an accident, she might have studied the piano*). Following Condoravdi's proposal, we'd say that we interpret (74) as true because we can go back in the history of the world to some time before the accident, and continue along the branch of some historic alternative in which she (does not have an accident and) studies the piano.

What about the second case, when (74) is about somebody who has a hearing impairment? Clearly, if we go back to some time shortly before the accident and branch off, we will not find worlds in which she (did not have an accident and) studied the piano (presumably, the hearing impairment would have ruled that out anyway). But we could also, in principle, go back to some past time before she is born, and then continue along the branch corresponding to some historic alternative in which she was not born with a hearing impairment, did not have an accident, and studied the piano.

The fact that we do not judge (74) true when it is about a person with a hearing impairment suggests that there are restrictions in the way we find a past time from which the histories branch off. We tend to interpret even simple *might*-sentences with some contextually given implicit restrictions.

Similarity could be of help in figuring out how to restrict the domain of *might* even in the case of simple modals. However, it seems to me that using similarity to do this job renders part of the truth conditions proposed by Condoravdi rather trivial. The perfect *have* would not do much work. After all, it appears rather trivial to find some past time from which to branch off into alternative worlds. If we incorporated similarity, what would really matter would be whether there were alternative worlds similar enough to the actual world to count.

The conclusion is that existential quantification over the past time from which we branch off (often) results in a very weak condition. By itself, it doesn't explain differing judgments with respect to examples like (74). If we prop it up by adding a similarity requirement (as I did above), the condition appears rather trivial.

2.6.4 Discussion

In this section I will present some arguments against the idea that the counterfactual interpretation for modals in *would*-conditionals arises when the perfect scopes over the modal. I am not arguing against the idea that counterfactual possibilities are possibilities that were available in the past. That may (or may not) be the case. I am arguing against the idea that the composition of the meaning of the sentences reflects this by having *have* scope over the modal, shifting the modal's accessibility relation to the past. Towards this end, I will present further discussion of the adverb data (§2.6.4.1), and present also data from sequence of tense examples (§2.6.4.2), and stative predicates (§2.6.4.3).

2.6.4.1 Adverbs

I would like to review the evidence that adverbs and German provide in favor of Condoravdi's scope-based account. We'll begin with *already*. Is it true that in English a counterfactual interpretation is not available for the combination of modal, *already* and a perfect (see (65a))?

If we simply look at examples like (75), we would be tempted to conclude that the answer is 'yes':

(75) He isn't home yet. #But he might have already returned.

The sequence is definitely odd, and might lead us to conclude that the modal sentence cannot receive a counterfactual interpretation. However, the same sequence without *already* is also odd:

(76) He isn't home yet. #But he might have returned.

The oddness of this example is not predicted. Nothing prevents *have* from scoping over *might* with a perfectly acceptable counterfactual interpretation.

Why is (76) odd? It could be that we tend to interpret *might* as compatible with our knowledge, and carry out the revisions needed for a counterfactual interpretation only in face of clear evidence that they are required.²⁶ If so, examples like (75) would not tell us anything about adverb interaction. Let us turn to a different kind of example:

(77) The police haven't put out a warrant yet. But they might have done so. You were right to take precautions.

In this example there is a direct contrast between what the police did(n't) do and the possibility we are contemplating. We are immediately clued in to the fact that we will have a counterfactual interpretation, and the sequence is not odd. A sequence with *already* is similarly acceptable:²⁷

(78) The police haven't put out a warrant yet. But they might have already done so. You were right to take precautions.

Another example is given in (79):

(79) Luckily nothing has happened yet. But the princess might have already kissed the frog. You were right to be worried.

The examples in (80) are interesting because the temporal modifier *by the time that* is only possible in combination with the perfect (**They solved the mystery by the time the trial started*). The examples show that *already* is compatible with eventive predicates, the modifier *by the time that*, and a counterfactual interpretation.

²⁶ There is some reason to think that in the absence of an clear restriction, the default interpretation is epistemic. Note that *would* is much worse in these cases:

(i) He isn't home yet. #But he would have returned. (thanks to Angelika Kratzer for pointing this out). Of course the restriction doesn't have to come from an *if*-clause. In some cases, context is enough:

(ii) George failed the exam, but his brother would have passed. (Kaspers 1992)

²⁷ The argument is confounded by the fact that some people find *They already put out a warrant* to be fine.

(80) a. They might have already solved the mystery by the time the trial started, but they hadn't.

b. They might have already drunk all the whiskey by the time we got there, but they hadn't.

c. The books might have already arrived by the time the classes started, but they didn't.

It seems to be the case that at least in English, *already* is compatible with a counterfactual interpretation when there is a modal and a perfect. This suggests that the perfect does not scope over the modal when the interpretation is counterfactual.

The case of German is interesting because it seems to provide clear and direct evidence that relative scope is responsible for the differences in interpretation. However, let me point out that the German examples in (67) differ in two ways: in terms of the linear scope between the perfect and modal, and in terms of the mood morphology in the perfect and modal. The reason I am bringing this up is that Spanish is also a language that allows both scope options overtly. But the interpretation depends on the choice of tense and mood morphology. The options are spelled out below [Ind = indicative, Past = simple past, Inf = infinitive, Part = participle, Pot = potential/considered by traditional grammars to be a tense/mood classification on its own, usually translated into English with *would*]:

(81) a. Pudo haber llegado temprano.
 can-IndPast have-Inf arrive-Part early

b. Podría haber llegado temprano.
 can-Pot have-Inf arrive-Part early

c. Hubiera podido llegar temprano.
 have-SubPast can-Part arrive-Inf early

d. Habría podido llegar temprano.
 have-Pot can-Part arrive-Inf early

'He/She/It could have arrived early'

Although the English gloss is the same for all the examples, there are differences in the information conveyed by (81a-d). We could felicitously utter (81b) if we know that she did not arrive early, but she had a chance to do so. We would not utter (81a) in such scenario. We would use (81a) if we did not know whether she arrived early or not, but consider it to be a possibility. The difference between (81c) and (81d) is very subtle, and in many (most) contexts they appear to be identical. One context that allows us to distinguish between the two options is provided by *at least*:

(82) a. Aunque sea, hubieras podido llegar temprano.
b. Aunque sea, habrías podido llegar temprano.
at least,

'At least, you could have arrived early'

The English sentence *At least, you could have arrived early* can be interpreted in the sense of “at least, you would have been able to arrive early” or “at least, you should have arrived early/ the least you could have done was arrive early”. There is a slight difference between the Spanish sentences. One could more easily use (82a) to reproach somebody (*at least, you should have arrived early*) than (82b).

This section remains rather inconclusive, but I would like to rescue the following points: one is that *already* in English is more flexible than Condoravdi’s proposal would lead us to expect, and the other is that the German data does not conclusively show that Condoravdi’s proposal for the interaction between the interpretation of the modal, *already* and the perfect is correct. I have given counterfactual English examples to support the first point. And I have given Spanish examples with different combinations of scope and mood to support the second. The point is important to me because I have argued that the availability of a counterfactual interpretation depends on the presence of past tense, not the auxiliary *have*. I will discuss the role of *have* in detail in Chapter 4.

2.6.4.2 Agreement

Sequence of tense examples provide evidence in favor of the idea that the modal in counterfactual in counterfactual constructions is c-commanded by a past tense, not perfect *have*. The hypothesis that the modal is c-commanded by a perfect does not explain the tense agreement phenomena.

Consider (83):

(83) It's a pity women could never stand George. A woman who loved him might have been able to improve his table manners.

In this example there is an indefinite in the scope of the modal. The indefinite includes a relative clause with past tense morphology. However, there is no past tense interpretation. The hypothesis can be understood as being about a woman who hypothetically loves George at the speech time. Tense morphology in the relative clause does not correspond to a semantic past tense. It can be understood as a case of morphological agreement, suggesting that there is a higher c-commanding past tense.

As the example in (84) shows, a perfect itself does not trigger tense agreement:

(84) A woman who loved George has never been able to improve his table manners.

Past tense in the relative clause in (84) is interpreted as a real past tense. We are talking about a woman who loved George in the past, who is still unable to improve his table manners. And as the example in (85) illustrates, tense agreement is present even in the absence of a perfect:

(85) It is a pity that women could never stand George. A woman who loved him might be able to improve his table manners.

Tense agreement facts support my proposal that in *would*-conditionals, a past tense c-commands the modal.

2.6.4.3 **Stative verbs**

It seems to be a mistake to attribute the possibility of obtaining a counterfactual interpretation for a modal in *would*-conditionals to a wide-scope perfect *have*. One of the reasons is that it is possible to obtain a counterfactual interpretation without *have*. The trick is that the verb must be stative.

The proposal in Condoravdi (2001) agrees with our basic intuitions about simple examples like (86), which can only receive an epistemic interpretation (hence the oddity of the continuation):

(86) He might be happy. #But he isn't.

The reason that the sequence in (86) is odd is that an epistemic interpretation is incompatible with the simple negation of the statement.

However, when *might* appears in a conditional construction, a counterfactual interpretation is available even in the absence of a perfect:

(87) If she were here, he might be happy. But she isn't.

Examples like these are not directly problematic because Condoravdi's proposal is not designed to deal with conditionals anyway. But the examples do suggest that the perfect is not responsible for the availability of a counterfactual interpretation.

Chapter 3

BACKTRACKING COUNTERFACTUALS

3.1 Introduction

In this chapter we will investigate the interpretation of *backtracking counterfactuals*. These are counterfactuals that assert that if the past, present or future were different, some earlier time would have been different too.

A brief discussion of backtracking counterfactuals made its way into David Lewis's 1979 paper *Time's Arrow*. His examples are given below (we will return to these examples in §3.2):

- (1) Jim and Jack had a terrible quarrel yesterday. Jack is still very angry.
 - a. If Jim asked Jack for help today, there would have been no quarrel yesterday.
 - b. If Jim asked Jack for help today, there would have to have been no quarrel yesterday.

The judgments surrounding the examples in (1), and backtracking counterfactuals in general, are not always clear. Backtracking counterfactuals are usually judged false. But not always. As we will see later, contextual support can help a lot in shifting our intuitions to the point where we are prepared to judge a backtracking counterfactual as true. Moreover, backtracking counterfactuals are usually helped by a special, characteristic syntactic structure. But this is not always necessary.

My goal is to identify the properties that distinguish backtracking counterfactuals from others, and to figure out how their characteristic syntax affects their interpretation.

3.2 Preliminaries: Lewis 1979

In his 1979 paper *Time's Arrow*, David Lewis defends a temporally asymmetric view of counterfactual dependencies. He argues that the way things are later depends counterfactually on the way things are earlier, and not the other way around. The future

depends counterfactually on the present (*If the present were different, the future would be different*), and the present depends counterfactually on the past (*If the past had been different, the present would have been different*). But the past does not depend counterfactually on the present (*If the present had been different, the past would have been different*), and the present does not depend counterfactually on the future (*If the future were different, the present would be different*). I will refer to this pattern as the *G(eneral) P(attern)*:

(2) **GP:** The way things are later depends counterfactually on the way things are earlier, and not the other way around.

Lewis's asymmetric view is challenged by the fact that some counterfactual conditionals, called *backtracking* conditionals, appear to not follow the GP. However, Lewis thinks that these counterfactuals are special, and do not constitute a real counterexample to his asymmetric view. They are special because they are usually considered false, and are usually marked by a special selection of modals and auxiliaries.

Backtracking counterfactuals make a hypothesis concerning some time *t* (past, present, or future), and then claim that it follows from that hypothesis that some time earlier than *t* would have been different. Below is an example by Lewis:

(3) *Jim and Jack quarreled yesterday, and Jack is still hopping mad. We conclude that if Jim asked Jack for help today, Jack would not help him. But wait: Jim is a prideful fellow. He never would ask for help after such a quarrel; if Jim were to ask Jack for help today, there would have to have been no quarrel yesterday. In that case Jack would be his usual generous self. So if Jim asked Jack for help today, Jack would help him after all.*

The backtracking conditional in this example has been singled out below:

(4) *If Jim asked Jack for help today, there would have to have been no quarrel yesterday.*

Let's look at it more closely. Say the actual world is w_0 :

(5) *there is a quarrel* *Jim does not ask for help*
-----**t₁**-----s*-----**t₂**----- **w₀**

In the actual world there is a quarrel, and Jim does not ask for help. In our terms (presented in Chapter 2), the counterfactual in (4) claims that worlds that contain a counterpart of the past in which Jim does ask for help today are worlds like w_1 , which differ from the actual world at some before the request:

(6) *there is no quarrel* *Jim asks for help*
-----**t₁**-----s*-----**t₂**----- **w₁**

This is the pattern that is typical of backtracking counterfactuals. We only judge them true if we accept that the worlds quantified over by the modal are worlds that differ from the actual world at some time before the *if*-clause time. For this reason, I will occasionally say that backtracking counterfactuals ask us to 'change the past'.

Backtracking counterfactuals are often marked by 'special syntax'. We see this in the example in (4), which has a special selection of modals and auxiliaries *would have to have*. In a very interesting parenthetical comment, Lewis remarks on this 'special syntax' (Lewis 1979: 34-35):

(7) *(Back-tracking counterfactuals, used in a context that favors their truth, are marked by a syntactic peculiarity. They are the ones in which the usual subjunctive conditional constructions are readily replaced by more complicated constructions: "If it were that.... then it would have to be that...." or the like. A suitable context may make it acceptable to say "If Jim asked Jack for help today, there would have been no quarrel yesterday", but it would be more natural to say "... there would have to have been no quarrel yesterday. (...))*

My goal in this chapter will be to investigate why some backtracking counterfactuals can be judged true and how the special syntax is interpreted. In §3.3 I will give a small overview of types of backtracking counterfactuals, in §3.4 I will present additional data and generalizations about the different cases, and in §3.5 I will develop a proposal to explain the interpretation of these conditionals.

3.3 A first look at the data

I will distinguish between two kinds of backtracking conditionals: *real backtrackers* and *conditionals with backtracking resolution*.

Real backtrackers are conditionals that explicitly claim that if a certain hypothesis held at time t (past, present or future), something different would have happened at some earlier time t' . Examples are given below:

(8) a. *Real backtrackers with regular syntax*

If Jim asked Jack for help, there would have been no quarrel yesterday.

b. *Real backtrackers with special syntax*

If Jim asked Jack for help, there would have to have been no quarrel yesterday.

The examples in (8) explicitly claim that if the future were different, the past would be different too. Some real backtrackers come with regular syntax (8a), and some come with special syntax (8b). As Lewis points out, it is much easier to agree to the truth of real backtrackers with special syntax than to the regular ones.

Conditionals with a backtracking resolution are different. They do not overtly violate the GP. They are special because we only judge them true if we accommodate a difference at some time earlier than the *if*-clause time. Lewis's example is given below:

(9) If Jim asked Jack for help, Jack would help him.

Given Lewis's story, the example in initially (9) is judged false. But if we follow the reasoning proposed by Lewis, and think that Jim would never ask for help if there had been a quarrel, and so if Jim asked for help there would have to have been no quarrel, and if there had been no quarrel, Jack would be helpful, then we would judge (9) to be true. That is, (9) would be judged true if we allowed ourselves to understand it as (10):

(10) If there had been no quarrel and Jim asked Jack for help, Jack would help him.

So even though conditionals with a backtracking resolution do not directly violate the GP, they are special because in order to judge them true we must be willing to accommodate some change at a time prior to the *if*-clause time.

In this chapter I will be concerned with real backtrackers. I will set aside conditionals that merely have a backtracking resolution. These seem to constitute a slightly different case, bearing some similarity to modal subordination. However, it is important to keep conditionals with a backtracking resolution in mind. The possibility of backtracking without special syntax is relevant in explaining our shifting intuitions about the truth value of backtracking conditionals.

3.4 On the possibility of changing the past

In this section we will see backtracking counterfactuals that are easily judged true without special syntax and backtracking counterfactuals that are only judged true with special syntax. The objective is to end up with generalizations about the relevant features of each case.

As an aside, it is interesting to note that not everybody agrees with Lewis that backtracking counterfactuals are somehow hard, or are usually judged false. Bennett (1984) argued against this view, giving examples that he considered very straightforward. Illustrations are provided in (11):

(11) a. If the die had fallen six uppermost, it would (have to) have been thrown differently. (Bennett 1984: 68)

b. If Stevenson were President in February 1953, he would have been elected in November 1952. (Bennett 1984: 79)
 (note: Stevenson lost the presidential elections to Eisenhower in 1952)

I will return to Bennett's examples below.

3.4.1 Examples that do not need special syntax to change the past.

We begin with backtracking counterfactuals that are intuitively felt to be straightforward (and true) without special syntax. The clearest cases are 'analytic':

(12) a. If he were a bachelor, he wouldn't have married.
 b. If she had a twin sister, her mother would have had at least two children.
 c. If she had sold a horse, she would have owned a horse.

In these examples the dependency between the state of affairs described by the antecedent and the state of affairs described by the consequent is guaranteed by the meanings of the words. In a sense, the antecedent and consequent clause describe the same state of affairs. To be a bachelor is to be somebody who hasn't married, to have a twin-sister is to have a mother who had two children at once, and to sell a horse is to exchange a horse one owns for money (assuming one only sells things one owns).

The dependency between antecedent and consequent in the examples in (12) does not hold because of properties of the evaluation world. It doesn't really matter what the evaluation world is like. Any world in which the antecedent is true will be a world in which the consequent is true. So obviously, any world that contains a counterpart of the past in which the antecedent is true will be a world in which the consequent is true. For conditionals such as these, anchoring to the actual world via similarity is not relevant to the truth value. So restrictions on similarity will have no effect.

Examples like these suggest that it is possible to change the past in a straightforward manner when there is a necessary connection between the antecedent and consequent. In such cases we do not need special syntax.

It is tempting to think that examples like these should not count as counterexamples to Lewis's asymmetric view about the history of the world. After all, the truth value of these conditionals does not depend on properties of the evaluation world. The examples are almost definitional, they are about the meanings of words, not about what is actually going on. If we understand the asymmetry described by Lewis to be about what is going on in the world, these sentences should not be considered counterexamples.

By examining the examples in (12), we come to our first generalization:

(13) **Generalization 1:** Backtracking counterfactuals with *regular* syntax can be judged straightforwardly true if the relation between antecedent and consequent is analytic / logically necessary.

The examples below, though maybe not as obvious as the ones in (12), still seem to follow the pattern in (13):

(14) a. If she were a semi-finalist, she would have won the quarter-finals.
b. If she were president, she would have won the last elections.
c. If you had been a surgeon, you would have gone to medical school.

To be a semi-finalist in a tennis tournament is to be a player who won the quarter finals, to be a surgeon is (at least) to be someone who has gone to medical school, to be a president is to be somebody who won the elections.

The example provided by Bennett that does not make use of special syntax is of this kind:

(11) b. If Stevenson were President in February 1953, he would have been elected in November 1952.

The person who is president at any given point is the person who won the last presidential elections. We would not call somebody *president* unless this were the case.

A different kind of example that is felt to be relatively straightforward concerns the arithmetic of time:

(17) a. If you were sixty years old now, you would have been born sixty years ago.
b. If it had been three o'clock one hour ago, it would have been two o'clock two hours ago.

None of the examples follow the GP, yet they are relatively straight-forward (once we do the math). In a sense, it is clear to see why. Given a certain understanding of statements about time, there is no choice in the matter (accepting that we understand that *x is sixty years old* means *x was born sixty years ago*, and not *x has been alive for sixty years*).

Let us contrast the analytic cases with some non-analytic examples that depend on natural laws. Even though natural laws express robust generalizations about the actual world (indeed, they have no exceptions in the actual world), they cannot disobey the GP with ‘regular syntax’. The examples below appeal to natural laws, but we do not straightforwardly judge them to be true. They are much better with special syntax:

(18) a. ?If the leaves had been red last autumn, it would have rained a lot the previous summer.
[vs. *If the leaves had been red last autumn, it would have to have rained a lot the previous summer.*]
b. ?If the metal strip had snapped, the circuit would have closed at some earlier time.
[vs. *If the metal strip had snapped, the circuit would have to have closed at some earlier time.*]

One of Bennett’s examples falls along these lines:

(19) a. If the die had fallen six uppermost, it would (have to) have been thrown differently.

Bennett himself notes that the conditional is much improved with special syntax. In §3.4.3 I will discuss why special syntax helps in cases like this.

Before turning to the next section, let us take a brief detour through *might*-counterfactuals. *Might*-counterfactuals are often characterized as the existential version of *would*-counterfactuals. It is possible to find backtracking *might*-counterfactuals that are easily judged true in the absence of special syntax. The relation between antecedent and consequent in such counterfactuals need not be analytic. Still, backtracking *might*-counterfactuals do not count as counterexamples to the generalization in (13). These counterfactuals rely on the conditions that make more general *would*-counterfactuals true:

(20) a. If you were sixty years old, you might have been born in Buenos Aires sixty years ago.
b. If you had been a surgeon, you might have gone to medical school in Boston.
c. If she were president, she might have won the elections in Florida.

The truth of these conditionals depends on a mixture of language-facts and world facts. Take (20b): if you had been a surgeon, you would have gone to medical school. This is something that follows from our understanding of the word *surgeon*, and this is what licenses backtracking. Whether medical school in Boston was really one of the options depends on facts about the actual world.

3.4.2 Examples that need special syntax in order to change the past

Let us turn now to backtracking counterfactuals that are judged (much) better with special syntax than with regular syntax. In these kind of examples, we are typically dealing with regularities or laws that depend on features of the evaluation world (here this is just the actual world):

We'll start with a food-related example:

(21) A: She is a very strict vegetarian. If she had eaten pudding, she would have broken her diet.

B: a. No, if she had eaten pudding, it would have been made without gelatin.

b. No, if she had eaten pudding, it would have to have been made without gelatin.

Our first reaction is to say that the conditional in (21a) is very odd, maybe even false. But we are more flexible with the conditional in (21b). It overtly invites us to consider the antecedent in situations that agree with her usual disposition to not eat animal-related products. It is much easier to judge this conditional true.

We turn now to an example involving a night guard, an alarm button, and a false alarm:

(22) A: It's lucky the guard didn't push the alarm button. It would have been a false alarm.

B: a'. ?Actually, he is a very intelligent man. If he had pushed the button, something serious would have happened.

b'. Actually, he is a very intelligent man. If he had pushed the button, something serious would have to have happened.

We judge the conditional in (22a) to be odd or false. But the conditional in (22b) makes us think about the fact that the guard would never push the button unless something serious had happened. It is easier to judge this conditional true.

Lewis's Jim and Jack example follows this pattern:

(23) He (Jim) never would ask for help after such a quarrel; if Jim were to ask Jack for help today, there would have to have been no quarrel yesterday.

The use of special syntax *there would have to have been no quarrel yesterday* makes us think about the fact that people do not usually ask for help after a quarrel. This makes it easier to judge the conditional true.

The generalization seems to be that the special syntax helps if there is a (salient) law that establishes a necessary connection between the antecedent and consequent. The presence of the modal *have* makes it clear that we are interested in cases that respect the law. The presence of the modal indicates that the law should count as relevant, and affects the kind of worlds that are relevant antecedent worlds.

(24) **Generalization 2:** Backtracking counterfactuals with special syntax can be judged true if some (salient) law establishes a relation between antecedent and consequent.

3.4.3 Examples in which the special syntax does not help.

Let us turn now to backtracking counterfactuals that are judged to be false, and that are not helped by the special syntax. An example is provided below:

(25) *The bridge wasn't completed, and the driver came to a sudden stop.*

- If the driver had kept going, the bridge would have been completed.
- If the driver had kept going, the bridge would have to have been completed.

Speakers typically judge both backtracking counterfactuals as false (the first reaction is simply that they are very odd). This is not surprising in the case of (25a). After all, there is no analytic connection between the antecedent and consequent clause. What is of interest to us here is that (25b) is also judged false. Special syntax does not help here. Intuitively, the problem seems to be that there isn't a strong enough link tying the

antecedent and consequent together. After all, it could have been the case that the driver kept going with the purpose of driving off the unfinished bridge.²⁸

What is going on? As a first hypothesis, let us consider the idea that the problem in (25b) is that the universal modal is too strong. As we said, there are other options to consider: sometimes drivers purposefully drive off half-constructed bridges.

(26) **Generalization 3 (preliminary):** Cases in which the special syntax does not help with backtracking are cases in which the universal quantificational force of *would* is excessive.

The examples below have been designed to lend plausibility to this hypothesis. We begin with another food scenario:

(27) *She loves desserts in general, but she doesn't like chocolate. She didn't even touch the chocolate mousse.*

- If she had eaten dessert today, the cook would have made a peach pie yesterday.
- If she had eaten dessert today, the cook would have to have made a peach pie yesterday.

Both (27a) and (27b) are judged to be false. Special syntax does not help us to change the past in this case.

The example seems to support the hypothesis that the problem is the excessive quantificational force of the modal. After all, there are a variety of desserts that the cook could have made that would have induced her to have dessert.

The example in (28) makes the same point:

(28) *John is making a cabinet, and in doing so he cuts the wood, drills holes, hammers in nails, etc. He is very careful, and does not get hurt.*

- a. If he were crying now, he would have hit his thumb with the hammer.
- b. If he were crying now, he would have to have hit his thumb with the hammer.

Both (28a) and (28b) are judged to be false. It could be that in this case too special syntax fails to help because of the excessive quantificational strength of the modal. After all, there were a variety of options that could have led him to cry (he might have gotten hurt with the saw, with the drill, etc.).²⁹

However, there are examples that suggest that the preliminary *Generalization 3* is not correct, and that the problem does not arise because of excessive quantificational strength of *would*. Some illustrations are given below:

- (29) *The bridge wasn't completed, and the driver came to a sudden stop.*
 - a. If the driver had kept going, the bridge might have been completed.
 - b. If the driver had kept going, the bridge might have to have been completed.
- (30) *John is making a cabinet, and in doing so he cuts the wood, drills holes, hammers in nails, etc. He is very careful, and does not get hurt.*
 - a. If he were crying now, he might have hit his thumb with a hammer.
 - b. If he were crying now, he might have to have hit his thumb with a hammer.

The (b) sentences in (29) and (30) are not better backtrackers than the (a) sentences. Special syntax does not facilitate backtracking in these cases.

The conditionals in (29) and (30) have *might* instead of *would*. In these cases, we assert that some of the antecedent worlds are worlds in which the consequent clause is

²⁸ Some speakers judge (25b) true. They think only of sensible drivers, and appeal to a law that says that drivers do not keep going unfinished bridges. Under this interpretation, this example simply obeys Generalization 2.

²⁹ The example in (32b) is judged true by speakers who assume that he only screams when he is hit by a hammer.

true. If the (only) problem in the (25, 27, 28 b) cases above had been the excessive quantificational force of the modal, the *might* examples above should have been straightforwardly true. But this is not the case.

I conclude that it isn't excessive quantificational force that is causing the problem in (25b), (27b) and (28b). I propose instead that the problem arises because there is no (salient) generalization linking the antecedent and consequent clause. That is, there is no (salient) law to be invoked by *have*. I propose the generalization in (31):

(31) **Generalization 3:** Cases in which special syntax does not help with backtracking counterfactuals are cases in which there is no (salient) law or regularity to be invoked by *have*.

3.4.4 Summary

We have come up with three generalizations that we would like to explain:

(13) **Generalization 1:** Backtracking counterfactuals with *regular* syntax can be judged straightforwardly true if the relation between antecedent and consequent is analytic/logically necessary.

(24) **Generalization 2:** Backtracking counterfactuals with special syntax can be judged true if some salient law establishes a relation between antecedent and consequent.

(31) **Generalization 3:** Cases in which special syntax does not help with backtracking counterfactuals are cases in which there is no (salient) law or regularity to be invoked by *have*.

3.5 On the availability of backtracking and the role of special syntax

In this section I present an analysis that seeks to provide a compositional account of the generalizations made above. I will start by briefly reviewing the proposal for the interpretation of *would* presented in Chapter 2.

3.5.1 Review

In Chapter 2 I proposed a *de re* analysis of *would*-conditionals. At the center of the analysis is the interpretation for the modal given in (32):

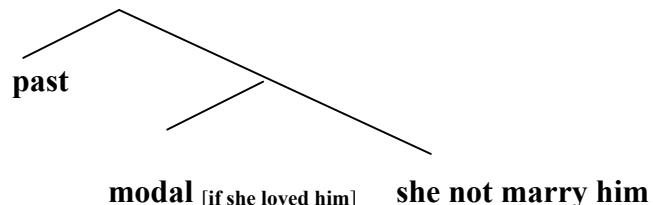
$$(32) \quad [[\mathbf{w} \mathbf{o} \mathbf{l} \mathbf{l} \mathbf{-} \mathbf{t}_i]]^g: \lambda P_{\langle i, \langle s, t \rangle \rangle} \lambda Q_{\langle i, \langle s, t \rangle \rangle} \lambda t \forall w [t < w \ \& \ P(g(t_i))(w) \rightarrow Q(g(t_i))(w)]$$

where g is an assignment function, and $g(t_i)$ is restricted to non-past times

(repeated from Chapter 2)

Given the proposal in (32), a conditional like *If she loved him, she wouldn't marry him* would receive the truth conditions spelled out in (34c)³⁰:

(33)



(34) a. If she loved him, she wouldn't marry him

b. *Preliminary*

$$[[\mathbf{if} \mathbf{she} \mathbf{loved} \mathbf{him}]] = \lambda t \lambda w [\text{she-loved-him at } t \text{ in } w]$$

c. *Where t is a non-past time,*

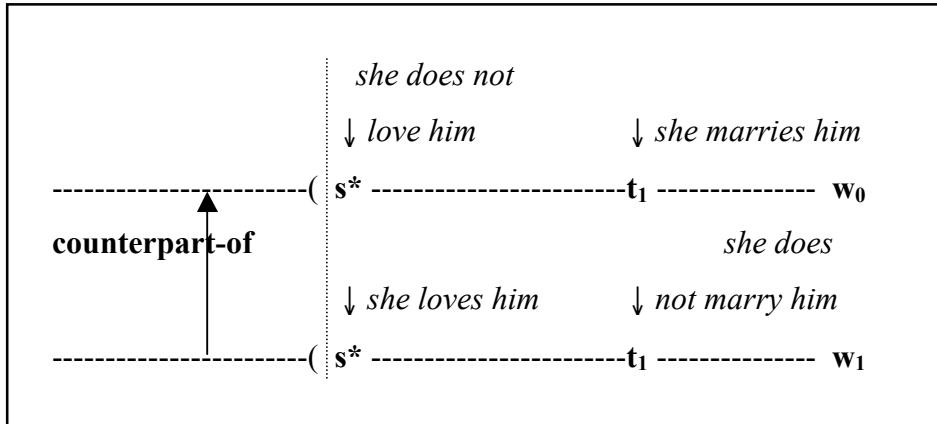
$$[[\mathbf{if} \mathbf{she} \mathbf{loved} \mathbf{him}, \mathbf{she} \mathbf{wouldn't} \mathbf{marry} \mathbf{him}]]^{w^0} = 1 \text{ iff}$$

$$\forall w [[\text{past}_0 < w \ \& \ \text{she-loved-him at } t \text{ in } w] \rightarrow$$

$$[\text{not she-marries-him at } t \text{ in } w]]$$

According to the proposal in (34c), (34a) is true iff the worlds in which she loves him that contains a counterpart of the actual world past, are also worlds in which she does not marry him. (34a) will be true if the worlds quantified over are like w_1 in (35):

(35)



3.5.2 Generalization 1: Backtracking without special syntax

We already have all the ingredients necessary to talk about cases of backtracking without special syntax. We will examine two examples here. One in which backtracking is possible (36), and one in which it is not (39). We'll start with (36):

(36) *Preliminary*

Where t is a non-past time,

$[[\text{If she were president, she would have won the last elections}]]^{w_0} = 1$ iff

$\forall w [[\text{past}_0 < w \ \& \ \text{she is president at } t \text{ in } w]] \rightarrow$

$[\text{she has won the last elections at } t \text{ in } w]]$

The modal *would* in (36) quantifies over worlds that contain a counterpart of the actual world past in which she is president. The antecedent clause proposition is the one in (37):

(37) *Where t is a non-past time,*

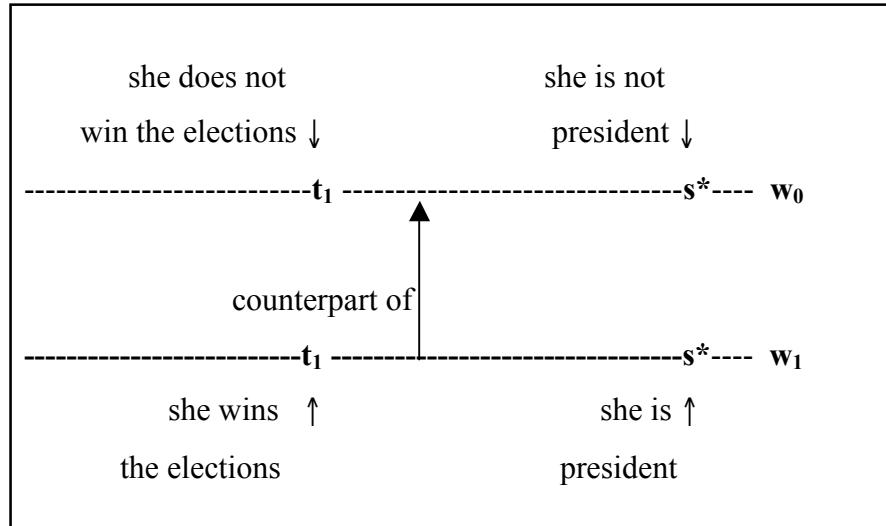
$\lambda w [\text{she-is-president}(t)(w)],$

The counterfactual in (36) is true iff the possible worlds that contain a counterpart of the past in which she is president are also worlds in which she has won the last elections.

³⁰ The proposals will be termed 'preliminary' till the discussion of aspect in Chapter 4.

Let us say that the actual world is represented by w_0 in (38) below. All worlds in which the antecedent is true will be worlds in which the consequent is true. The counterparts of the actual world past in the worlds quantified over by the modal will have to be different from the actual world past at some time before the speech time. Whatever restrictions we place on similarity, the worlds in the quantificational domain of the modal will be worlds like w_1 in (38), in which she won the last elections.

(38)



In (36) we examined a backtracking conditional that can straightforwardly be judged true. We look now at one that is judged false:³¹

(39) *Preliminary*

Where t is a non-past time,

$[[\text{If she had eaten pudding, it would have been made without gelatin}]]^{w_0} = 1$ iff
 $\forall w [[\text{past}_0 < w \ \& \ \text{she has eaten pudding at } t \text{ in } w] \rightarrow$
 $[\text{the pudding has been made without gelatin at } t \text{ in } w]]$

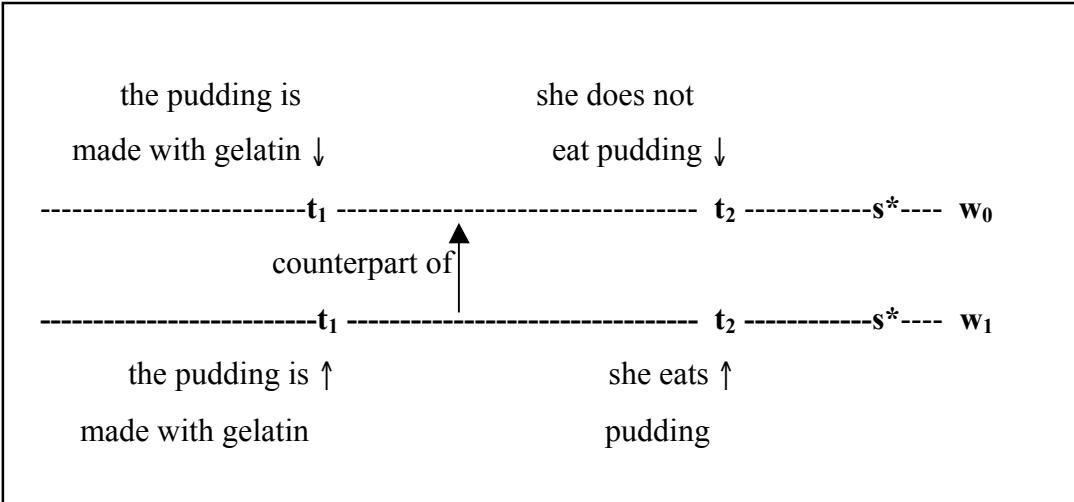
The antecedent clause proposition is the proposition that is true in a world if she has eaten the pudding at some non-past time:

³¹ There is an added complication here, as we are looking at a passive sentence. I have ignored that fact.

(40) *Where t is a non-past time,*
 $\lambda w[\text{she has eaten the pudding at } t \text{ in } w]$

The quantificational domain of the modal in (39) is made up of worlds that contain a counterpart of the actual world past in which she has eaten the pudding. The conditional asserts that such worlds are worlds in which the pudding had been made without gelatin. There isn't a necessary connection between her eating the pudding and the pudding having been made without gelatin. There is some connection: after all, as a rule, she doesn't eat animal related products. However, lots of things could have happened that would have led her to break that rule. Maybe she didn't know about the gelatin, or she was really really hungry, or she didn't want to offend the cook. Such events could have led to the breaking of the rule. The counterpart relation will favor worlds that are like the actual world in the past with respect to gelatin. The quantificational domain of the modal in (39) will include worlds like w_1 below, and the conditional will be judged false:

(41)



3.5.3 Generalizations 2 and 3: Backtracking with special syntax

We turn now to Generalizations 2 and 3. These generalizations state that special syntax helps with backtracking when a (salient) law links the antecedent and consequent

clause propositions, and only then. An example of a backtracking counterfactual that is helped by special syntax is given in (42):

(42) If she had eaten pudding, it would have to have been made without gelatin.

In the analysis I spell out below, *have(-to)* is treated as a modal. The conditional in (42) is analyzed as a conditional with two modals. The modal *would* quantifies worlds that contain a counterpart of the actual world past in which she has eaten pudding. The modal *have to* predicates a modal property of such worlds: the law-like world accessible from these worlds are such that the pudding has been made without gelatin. The goal is to provide a compositional account of the interpretation of the structure.

3.5.3.1 The interpretation of *have-to*

There are two *have*'s in (42). They appear to have quite different effects. A simple example of different *have*'s is given in (43):

(43) a. She has left.
b. She has to leave.

Have in (43a) embeds a participle. This is a standard perfect construction. In (43b), *have* embeds a *to*-infinitive. This construction has a modal meaning. Stowell (2003) refers to *have-to* as a 'semi-modal'. Here I will assume that there are two *have* auxiliaries, a perfect *have* and a modal *have_{mod}(-to)*.³² The interpretation of perfect *have* will be discussed in Chapter 4.

Following the analysis of *would*, I will treat modal *have_{mod}* as a universal quantifier over possible worlds. Statements with *have_{mod}* claim that some proposition holds in every possible world for some restricted domain. The quantificational domain of

³² It is worthwhile thinking whether there could be a unified approach to *have*, that could derive the different interpretations compositionally. I do not have an answer to this question. As far as I know, there isn't a proposal on the market. Portner (2001) has proposed a 'modal' interpretation of perfect *have*, but I do not think it (obviously) extends to the cases here.

have_{mod} is established by a contextually salient accessibility relation. The type of accessibility associated with *have_{mod}* differs from that associated with *would* [more on this in §3.4.3.2]. The worlds quantified over by *have_{mod}* are not identified on the basis of similarity in the past. Other kinds of relations come into play. Some examples are given in (44):

(44) a. She has to leave.
b. She has to know.
c. She had to pay a fine.

We can easily understand (44a) as saying that circumstances force her to leave (circumstantial/realistic modality), (44b) as saying that we have reasons to believe she knows (epistemic modality), and (44c) as saying that she has the obligation of paying a fine (deontic modality). Different contexts make salient different accessibility relations, and *have_{mod}* ends up quantifying over different kinds of worlds.

I propose to give *have_{mod}* the lexical entry in (45), which I will discuss below:³³

(45) $[[\mathbf{have}_{\mathbf{mod}-\mathbf{R}}]]^g (P_{<i, <s, t>>})(t)(w) = 1 \text{ iff}$
 $\forall w' [g(\mathbf{R})(t)(w)(w') \rightarrow \exists t' [(t=t' \text{ or } t < t') \& P(t')(w')]],$
where \mathbf{R} is of type $<i, <s, <s, t>>$ and $g(\mathbf{R})$ is a contextually salient temporally sensitive accessibility relation

According to (45), *have* comes with a free variable ranging over accessibility relations (\mathbf{R}). The felicitous use of *have_{mod}* presupposes the contextual availability of a salient accessibility relation R . R is temporally sensitive: given a time and a possible world, it returns a set of possible worlds. These make up the quantificational domain of the modal. The temporal argument of *have_{mod}* provides the accessibility time corresponding to R . According to (45), we are dealing with necessity relative to times: necessary at the speech time, in the past, etc.

³³ This proposal is arguably preliminary, as the relation between worlds and times should be better spelled out. Further work is needed.

have_{mod} combines with a property of times. It locates the property of times at some time t' non-past with respect to t . The choice of evaluation time for the clause sister to the modal ($t=t'$ or $t < t'$) depends on the type of modality associated with *have* and the aspectual properties of the embedded clause. Stative eventualities may overlap with the temporal parameter of the accessibility relation (e.g. *She has to love him* reports that according to our knowledge now, she loves him now), but eventive eventualities will follow (e.g. *She has to leave* reports that according to our knowledge now, she leaves at some time later than now)

According to the proposal in (45), the temporal argument of *have_{mod}* functions as the temporal parameter of the accessibility relation. It locates the time at which a modal property held. It does not locate the time of the event in the complement clause of the modal. Inspecting examples like (46), we realize that this is a good idea:

(46) She had to leave.

In (46) tense locates her obligation in the past. In the past it was the case that she had to leave. However, (46) does not locate a leaving event in the past. We can see this by putting (46) in a broader context, that makes clear that it is the obligation that held in the past:

(47) a. Elizabeth hesitated. She knew what she should do. She had to leave. But she decided to stay anyway.
b. They told her she had to leave. So she booked a ticket for the day after tomorrow.

It is true that we often interpret examples like (46) as informing us not only that she had an obligation, but that she actually did what she was supposed to do. This seems related to the kind of modality at stake. Consider (48), in an interpretation according to which the statement is true because of the laws of nature (in particular, gravity):

(48) The apple had to fall to the ground.

Examples like (48) teach us that it was obligatory (given gravity) that the apple fall to the ground. But they also teach us that the apple did actually fall to the ground. I propose that this is because in cases like this, the temporal parameter of the clause embedded under *have* is the same as the past temporal interval corresponding to tense on *have* (i.e. $t=t'$ in (45)). This means that in all the possible worlds that obey the law of gravity, that past tense interval included an event of the apple falling to the ground. Since the actual world is one of those worlds, the apple fell to the ground in the actual world.

3.5.3.2 On the relation between *would* and *have_{mod}*

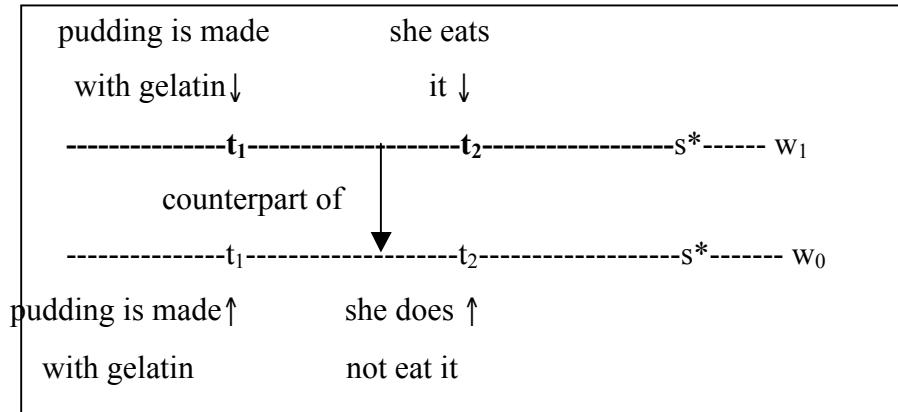
We return to the big picture. The goal is to spell out a compositional analysis of backtracking counterfactuals with special syntax. We want to understand the role played by the special syntax, in particular, why special syntax facilitates backtracking.

Example (42) is repeated below. The structure in (49) is a sketch of the LF of the consequent clause:

- (42) If she had eaten pudding, it would have to have been made without gelatin.
- (49) [would [have_{mod-R} -to [have_{perf} [the pudding been made without gelatin]]]]]

The consequent clause in (49) has two modals. One is *would*. The quantificational domain of *would* is established via anchoring to the actual world past. In the case of (49), *would* quantifies over worlds that contain a counterpart of the past in which she ate pudding. If the pudding was made with gelatin in the actual world, there will be worlds where it was also made with gelatin in the quantificational domain of *would*. *Have_{mod}* predicates a modal property of these worlds. It tells us that in the law-like worlds accessible from these worlds, the pudding was made without gelatin. The law that is relevant here is the law that she does not eat animal products. Let me try to put this in a schema:

(50)



The modal *would* quantifies over worlds that contain a counterpart of the past in which she ate pudding. The domain of quantification of *would* will include worlds like w_1 , in which she eats pudding made with gelatin. The consequent in (49) predicates a modal property of such worlds: the law-like worlds accessible from these worlds are worlds in which the pudding had been made without gelatin at some non-past time (presumably, this being a stative statement, it would have been made without gelatin at the speech time). These means that in the law-like worlds accessible from the worlds in the quantificational domain of *would*, the pudding was made without gelatin in the past.

The presence of modal *have* in the consequent clause in (42) has important consequences. The conditional does not claim that the worlds in the quantificational domain of *would* are worlds in which the pudding was made without gelatin. It claims that they are worlds where it should have been made without gelatin (according to whatever salient law establishes the quantificational domain of $have_{mod}$).

3.5.3.3 The *if*-clause

I have adopted a tri-partite structure for the modal *would*. According to that proposal, the *if*-clause in examples like (42) syntactically restricts *would*. However, I have also noted that this is probably a simplification, and that a dynamic analysis will ultimately be necessary (see a.o. von Fintel (1992), (2001)). In this section I would like to set aside the exact nature of syntactic composition, and investigate the relation between the *if*-clause in (42) and the interpretation of both modals. I will argue that the *if*-clause actually restricts the quantificational domain of both *would* and *have_{mod}*, suggesting that a

dynamic analysis is crucial to a reasonable understanding of the construction. We'll start by imagining what would be the case if the *if*-clause did not restrict both modals, and from there work on to the conclusion that it must do so.

3.5.3.3.1 Does the *if*-clause restrict *would*?

It seems fairly intuitive to think that the *if*-clause in (42) restricts *would*. Still, it is worth asking whether we actually have an argument for such idea. Why couldn't the interpretation proceed as in (51), where *would* is not restricted by the *if*-clause, but *have* is:

- (42) If she had eaten pudding, it would have been made without gelatin.
- (51) [would [have-to_{mod/ R} if-clause [have_{perf}[the pudding been made without gelatin]]]]

Granted, it is not easy to see what this would mean. Let us try to understand it by examining the following sequence:

- (52) If she had come home early, she would have eaten dinner with us. But if she had eaten dessert, it would have to have been made without gelatin.

Can we interpret the second conditional as in (53)?

- (53) [would_{/if she had come home early and she had eaten dinner with us} [have-to_{mod/ R} if she had eaten pudding [have_{perf}[the pudding been made without gelatin]]]]

According to the proposal in (53), the modal *would* is restricted by material originating in the previous sentence (i.e. *would* quantifies over worlds in which she came home early and ate dinner with us) and the modal *have* is restricted by the *if*-clause (i.e. *have* quantifies over worlds that obey the laws in which she ate pudding). Let me put this in a picture:

(54)

pudding is made	she does not come	she does not eat
with gelatin ↓	home early ↓	pudding ↓
----- t₁ -----	----- t₂ -----	----- t₃ -----
		s[*] ----- w₀
pudding is made	she comes	she does not eat
with gelatin ↓	home early ↓	pudding ↓
----- t₁ -----	----- t₂ -----	----- t₃ -----
		s[*] ----- w₁
pudding is made	she comes	she eats
without gelatin ↓	home early ↓	pudding ↓
----- t₁ -----	----- t₂ -----	----- t₃ -----
		s[*] ----- w₂

The world w_0 represents the actual world. In the actual world, the pudding was made with gelatin, she did not come home early, she did not eat dinner with us, and she did not eat pudding. According to (53), *would* quantifies over worlds in which she comes home early and eats dinner with us. That is, *would* quantifies over worlds like w_1 , which differ from the actual world in that she came home early and had dinner with us, but are like the actual world in that she did not eat pudding. *Have_{mod}* then quantifies over the law-like worlds accessible from the worlds in the domain of *would* in which she eats pudding. These are worlds like w_2 . The conditional asserts that in those worlds pudding was made without gelatin.

Can we show that the *if*-clause does not function in this way? Intuitions are not very clear on this point. Still, I think we can use examples like (55) to argue against this possibility:

(55) a. She isn't smart. If she were smart, she would be happy.
 b. I don't know whether she was smart or not. But if she was smart, she had to be happy.
 c. #She wasn't smart. If she were/ had been smart, she had to be happy.

We can easily understand (55a) as a counterfactual. She is not smart, but if she were, she would be happy. The example in (55b) shows that it is possible to link her happiness to her smartness in *have-to* indicative conditionals (note the epistemic flavor). But, as (55c) shows, it is not possible to counterfactually link her happiness to her smartness with *have-to* conditionals.

The examples in (55) teach us that we cannot use modal *have-to* to make a counterfactual hypothesis. This means that the *if*-clause in (42) has to modify *would*: *would* is responsible for taking us to 'counterfactual' worlds in which she eats pudding. The conditional then asserts that in all such worlds that obey the law, pudding was made without gelatin.

Another picture:

(56)

pudding is made	she does not come	she does not eat
with gelatin ↓	home early ↓	pudding ↓
-----t ₁ -----	-----t ₂ -----	-----t ₃ -----s*----- w ₀

pudding is made	she comes	she eats
with gelatin ↓	home early ↓	pudding ↓
-----t ₁ -----	-----t ₂ -----	-----t ₃ -----s*----- w ₁

pudding is made	she comes	she eats
without gelatin ↓	home early ↓	pudding ↓
-----t ₁ -----	-----t ₂ -----	-----t ₃ -----s*----- w ₂

The actual world is represented by w_0 . *Would* quantifies over the most similar worlds in which she comes home early, has dinner with us, and eats pudding. These are worlds like w_1 . The rest of the consequent clause asserts that the most similar law-like worlds to these are worlds in which pudding was made without gelatin. These are worlds like w_2 .

The conclusion is that *would* is necessary to evaluate the effects of laws in cases in which the *if*-clause is incompatible with the actual world. *Would* is responsible for making these worlds accessible. *Have_{mod}* then states what the laws claim about such worlds. Note that the laws that are being evaluated in such ‘counterfactual’ worlds are laws that hold in the actual world. In the case of backtracking counterfactuals we are interested in figuring out what the law-like patterns would have been if circumstances had been different.

3.5.3.3.2 Does the *if*-clause restrict *have*?

Let us turn now to the issue of whether the *if*-clause in (42) restricts *have_{mod}*. The *if*-clause is not syntactically connected to *have_{mod}*. However, in a dynamic framework, a syntactic connection between an *if*-clause and the modal it restricts would probably not be necessary. So, the question seems relevant.

It seems fairly intuitive to say that the *if*-clause does restrict *have_{mod}*. The modal appears to quantify over the law-like worlds in which she eats pudding. But it is interesting to ask whether we have arguments to back this up. After all, why can’t we say that the *if*-clause restricts only *would*? Couldn’t (57) be the correct LF for the consequent clause in (42)? It seems intuitive:

- (42) If she had eaten pudding, it would have been made without gelatin.
- (57) [would_{/if-clause} [have-to_{mod} [have_{perf} [the pudding been made without gelatin]]]]]

According to the proposal in (57), the *if*-clause associates only with *would*. *Would* quantifies over worlds in which she eats pudding. A picture is given below:

(58)

pudding is made	she does not eat
with gelatin ↓	pudding ↓
-----t ₁ -----	-----t ₂ -----s*----- w ₀

pudding is made	she eats
with gelatin ↓	pudding ↓
-----t ₁ -----	-----t ₂ -----s*----- w ₁

The actual world is represented by w_0 . *Would* quantifies over worlds that contain a counterpart of the past in which she eats pudding. These will be worlds like w_1 . Given the proposal in (57), *have_{mod}* quantifies over the law-like worlds accessible from the worlds in the quantificational domain of *would*.

I do not think this analysis coincides with our intuitions. It does not guarantee that *have_{mod}* will quantify over worlds in which she eats pudding and in which the pudding has been made without gelatin. This is because there are two kinds of law-like worlds accessible from w_1 . They are exemplified below:

(56)

pudding is made	she does not eat
with gelatin ↓	pudding ↓
-----t ₁ -----	-----t ₂ -----s*----- w ₂

pudding is made	she eats
without gelatin ↓	pudding ↓
-----t ₁ -----	-----t ₂ -----s*----- w ₃

Worlds like w_2 and w_3 are both law-like worlds. If *have_{mod}* simply quantifies over law-like worlds, it could be the case that the domain of *have_{mod}* would contain worlds like w_2 and like w_3 . But our intuitions about the truth value of (42) suggest that *have_{mod}* only

quantifies over worlds like w_3 . The only way to ensure that this is the case is to say that the *if*-clause in (42) restricts $have_{mod}$. This will make sure that $have_{mod}$ quantifies over law-like worlds in which she eats pudding. The modal asserts that such worlds are worlds in which pudding was made without gelatin.

The discussion above presented evidence in favor of the idea that the *if*-clause in examples like (42) restricts both modals independently. This in turn favors a dynamic account of the interaction between the *if*-clause and the modals. The *if*-clause may not actually be a syntactic argument of either modal, but it is able to affect the interpretation of both.

3.6 Conclusions

Lewis (1979) argued that the similarity relation responsible for fixing the quantificational domain of the modal in *would*-conditionals favored worlds that were like the actual world up to the time corresponding to the antecedent clause event. We have called this the G(eneral) P(attern). In this chapter we have investigated a type of *would*-conditional that appears to deviate from this norm. It is the case of backtracking conditionals. We differentiated between two types of backtracking conditionals: those with and without special syntax.

In the case of backtrackers without special syntax, the only cases in which the GP appears to be over-ridden involve logical/analytic necessity. I have suggested that such examples do not ‘count’ against the GP, in the relevant sense, since their truth value does not depend on properties of the evaluation world.

I have argued that backtrackers with special syntax only appear to violate the GP. What is really going on is that the special syntax adds another layer of modality, and makes it possible for us to evaluate what would have been the case if things had been different in law-like worlds that differ from the evaluation world in the past. But these worlds are not in the quantificational domain of *would*. In these examples, the similarity relation responsible for finding counterparts of the actual world past in other worlds only makes accessible worlds that are like the actual world in the past with respect to the relevant properties. It is the accessibility relation that fixes the quantificational domain of

have-to that is responsible for making accessible worlds that differ from the evaluation world at earlier times.

Chapter 4

THE PAST AND THE PERFECT

4.1 Introduction

It is now time to deal with the interpretation of aspect. So far, we have discussed the interpretation of past tense, ignoring aspectual differences. But aspect plays a crucial role in the interpretation of *would*-conditionals. The interpretation of the conditionals varies depending on whether the antecedent clause contains simple past tense morphology or past perfect morphology. Explaining this variation is the topic of this chapter. I will begin by presenting some examples.

(1) Suppose you will go on holidays next week, and ask me to look after your plants. I accept, but feel rather nervous. I am not very good with plants.

You: Could you look after my plants next week while I am away?

Me: Of course, but I am rather nervous. If your plants died next week, I would be very upset.

In this story there is a conditional with simple past tense morphology in the antecedent clause, and *would* + *infinitive* in the consequent clause. The hypothesis is a hypothesis set in the future.

Consider now the following continuation:

(2) (continuation) Suppose that your plants die before you leave on holidays, and you cancel your request. I would feel sorry, but also relieved.

You: Don't worry about looking after my plants. They died yesterday.

Me: I am sorry, but also a bit relieved. If your plants had died next week, I would have been very upset.

In this story there is a conditional with past perfect morphology in the antecedent clause and *would + have* in the consequent. In spite of the past perfect morphology, the antecedent clause again makes a hypothesis set in the future.

It would be very strange to utter the conditional we find in (1) if we knew that the plants were already dead. We would not make a hypothesis about an alternative death in the future using simple past morphology in the antecedent clause:

(3) Me: I am rather relieved that your plants died yesterday. #If they died next week (instead), I would be very upset.

The example in (3) is very odd. In this context, the conditional isn't interpreted as making a hypothesis about a contrary-to-facts state of affairs in which the plants die in the future instead of last week. We could only make sense of (3) if we accepted it as a hypothesis about the plants dying again, for a second time.

But maybe the conditional in (1) is not really a contrary-to-fact conditional. Maybe simple past conditionals just cannot be interpreted as making a hypothesis about a state of affairs that is contrary to fact...? No, this is not true. Consider the conditional in (4):

(4) Suppose you keep your plants in a dark closet in the kitchen, and are worried because they are not growing. I can see what is going wrong:

You: I am worried about my plants.

Me: Oh, they simply do not have enough light. If they had enough light, they would be fine.

There seems to be a difference between simple past tense examples with eventive verbs and examples with stative verbs. With stative verbs, we can make a hypothesis that we know to be contrary to fact with a simple past tense. This is not the case with eventive verbs. To make a 'contrary to fact' hypothesis that is contrary to fact about an event, we need past perfect morphology in the antecedent clause.

What do we learn from all these examples? Lewis (1973) reached the conclusion that there was a fundamental difference between the semantics of *would*-conditionals about the future and ‘counterfactual’ conditionals. *Would*-conditionals about the future were like indicative conditionals. Lewis said the following:

(5) The title ‘Subjunctive Conditionals’ would not have delineated my subject properly. For one thing, there are shortened counterfactual conditionals like ‘*No Hitler, no A-bomb*’ that have no subjunctives except in their –still all-too-hypothetical- deep structure. More important, 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 shall be considering.

(Lewis 1973: 4)

I would like to defend a different conclusion. I propose to give all *would*-conditionals a unified semantics, with the interpretation of *would* that we saw in Chapter 2. I will argue that the difference between (1), (2) and (3) lies in the way we restrict the quantificational domain of the modal, not in the interpretation of the modal itself. The crucial difference will be attributed to the interpretation of aspect.

Given the analysis proposed in Chapter 2, the modal in (2) quantifies over worlds in which there is an event of your plant dying next week that contain a counterpart of the actual world past. These are worlds in which the (actual world) past precedes an event of your plants dying in the future.³⁴ Arguably, given the fact that we understand that plants only die once, the only way the (actual world) past could precede an event of your plants dying in the future is if the past itself did not contain an event of your plants dying. For this reason, the relevant past counterparts will not include an event of your plants dying. The modal will quantify over worlds in which your plants die in the future and do not die in the past.

³⁴ In these cases it would be more insightful to replace the notion of temporal precedence with causation. However, here I will stick to precedence.

The modal in (3) does not quantify over the same worlds as the modal in (2). In the context given in (3), simple past tense morphology does not give the modal access to worlds that differ from the actual world with respect to the time of your plants death. We seem to be stuck with worlds in which your plants died yesterday.

I will argue that the difference between (2) and (3) lies in the fact that the propositions restricting the quantificational domain of the modal are not the same. The antecedent clause propositions are different, so the modals have access to different sets of worlds. The crucial difference between the examples is the choice of aspect. I will argue that in (3) there is a silent perfective aspectual head that is deictic. It anchors the antecedent clause proposition to worlds that are like the actual world with respect to the time of the plants death. The proposition that restricts the quantificational domain of the modal will only be true in worlds in which the plants die at the same time as in the actual world. For this reason, we cannot use (3) to quantify over worlds in which the dying event takes place at an alternative time. The difference with (2) is that the perfect aspectual head in (2) is not deictic. In this case, the corresponding antecedent clause proposition is not restricted to worlds in which the dying event takes place at the same time as in the actual world.

To understand what is going on in (2) and (3), it is important to compare (3) and (4). Even though there isn't perfect morphology in (4), the conditional still receives a 'classic' counterfactual interpretation. In this example, the modal can access worlds that differ from the actual world with respect to the antecedent clause. This again illustrates that the domain of quantification of the modal is affected by the choice of aspect. As we will see, the key contrast is between stative antecedents (including in this category both stative *akitionsart* and perfects), and perfective antecedents.

4.2 Focus and presuppositions: some previous proposals

Before turning to my own analysis, I would like to discuss two previous proposals that have dealt with the interpretation of examples like (1)/(3) and (2). These are the proposals found in Ogihara (2000) and Ippolito (2003). Ogihara relies on the interaction between the interpretation of the conditional structure and the focus structure of the antecedent clause. Ippolito relies on the role of presuppositions in conditionals.

4.2.1 Ogihara 2000

I will present Ogihara's proposal in a fairly informal manner. The reader is referred to Ogihara's text for the full formal details.

4.2.1.1 The proposal

Ogihara's theory of the interpretation of examples like (2) attributes a very important role to focus. Ogihara's own examples are given in (6) [the examples in (6) have the key properties of (2)]:

(6) a. If John had given flowers to Mary TOMORROW_F , she would have been pleased.
b. If we had gone out for a walk TOMORROW_F , we would have had a good time.

(Ogihara 2000)

We are interested in the utterance of (6a) in the following context: John, who is Mary's boyfriend, wanted to give Mary flowers for her birthday. Mary's birthday is tomorrow, but John mistakenly thought it was yesterday. So he gave her flowers yesterday. Mary was not very pleased with the flowers.

In this context, the utterance of (6a) tells us that if John had given Mary flowers tomorrow instead of yesterday, she would have been pleased. We understand (6a) as asserting that if the flower-giving event had had a different temporal location than the one it actually had (i.e. tomorrow instead of yesterday), Mary would have been pleased.

Let us turn now to (6b). Ogihara proposes we consider the utterance of (6b) in the following context: It was only possible for us to go on a single walk (within some contextually relevant period of time) and it had to be either today or tomorrow. We went out for a walk today, but it rained and we had a miserable time. The weather forecast predicts that tomorrow will be a lovely day.

In this context, the utterance of (6b) tells us that if we had gone for a walk tomorrow instead of today, we would have had a good time. Again, the antecedent

contrasts the time of the hypothetical walk (tomorrow) with the time of the actual walk (today). The conditional tells us that if the time had been different, we would have had a good time.

The intuition underlying Ogihara's analysis of the examples in (6) is that in these examples the time of a hypothetical event is contrasted with the time of some equivalent actual event. This is due to the effect of focus on the adverb. In (6a), for example, the time of the hypothetical flower-giving event is future. It contrasts with the past time of the actual flower-giving event. The role of the past perfect morphology is to locate in the past the actual world event that contrasts with the hypothetical one.

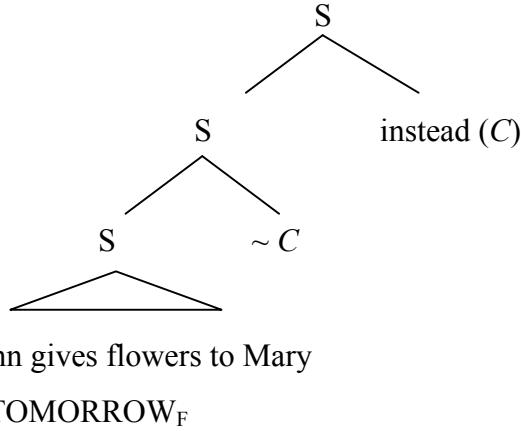
Ogihara proposes a semantics for conditional constructions based on Kratzer (1977/ 1981). One important addition is that he considers that conditionals like the one in (6) presuppose that context makes salient some proposition that contrasts with the antecedent clause proposition, and is true in the actual world in a contextually salient past time.³⁵

Informally, this works as follows: Adopting the semantics for focus found in Rooth (1992), Ogihara assumes that focus in the antecedent clause causes a focus operator \sim and a variable C to be introduced as a sister node to the antecedent clause. There is also a silent adverbial *instead* that combines with C . The syntactic representation of the antecedent clause in (6a) will be as in (7) (Ogihara 2000:11):

³⁵. The truth conditions given by Ogihara are as in (i):

(i) The truth conditions for a sentence of the form "If DP₁ PAST PERF₃ VP₁, DP₂ WOULD PERF₃ VP₂" are given in the following way. Let q be the denotation of "DP₁ VP₁" (tenseless), and r the denotation of "DP₂ VP₂" (tenseless), where q and r are elements of $D_{\langle i, \langle s, t \rangle \rangle}$. The entire conditional is true iff (i) the semantic object $p \in D_{\langle i, \langle s, t \rangle \rangle}$ that is provided by the context and is contrasted with q is such that $p(g_c(3))(w_c) = 1$ and for all maximal sets X in $A_{wc}(\{w: \text{there is an interval } i \text{ such that } q(i)(w) = 1\})$, $p(g_c(3)) \notin X$, and (ii) the proposition $\{w: \text{there is an interval } i \text{ such that } r(i)(w) = 1\}$ follows from every maximal set in $A_{wc}(\{w: \text{there is an interval } i \text{ such that } q(i)(w) = 1\})$. (Ogihara 2000: 9)

(7)



In (6) the *C* variable denotes a set made up of the proposition corresponding to the antecedent clause and the presupposed contrasting proposition supplied by context: $C = \{ \text{that John gives flower to Mary tomorrow, that John gave flowers to Mary yesterday} \}$.

Instead is a function that takes two arguments: *C* and the proposition that John gives flowers to Mary tomorrow.³⁶ The value is a proposition that is true iff the only true proposition in the *C*-set $\{ \text{that John gives flower to Mary tomorrow, that John gave flowers to Mary yesterday} \}$ is the proposition that John gives flowers to Mary tomorrow. The result of putting a silent *instead* in the antecedent clause of (6a) is that the antecedent clause denotes a proposition that is true in a world iff John gives flowers to Mary tomorrow and John did not give flowers to Mary yesterday.

Once everything is put together, Ogihara predicts the following: The conditional in (6a) presupposes that the context of utterance makes salient some proposition that contrasts with [John gives flowers to Mary TOMORROW_F]. This condition is satisfied in

³⁶ For reasons of space, I omit discussion of the formal details of Ogihara's proposal. For the sake of completeness, I present the denotation of *instead* in (i) (Ogihara 2000: (23)):

(i) *instead* translates as

$$\begin{aligned} & \lambda f_{\langle i, \langle s, \triangleright \rangle, \triangleright} [\lambda p_{\langle i, \langle s, \triangleright \rangle, \triangleright} [\wedge [\exists t_1 [\vee [p(t_1)]] \& \forall q_{\langle i, \langle s, \triangleright \rangle} [[f(p) \& q \neq p] \\ & \rightarrow \neg \exists t_2 [\vee [q(t_2)]]]]]]] \end{aligned}$$

Notation:

$f_{\langle i, \langle s, \triangleright \rangle, \triangleright}$ a variable of type $\langle i, \langle s, \triangleright \rangle, \triangleright$ (a set of temporally indeterminate propositions)

$p_{\langle i, \langle s, \triangleright \rangle, \triangleright}$ a variable of type $\langle i, \langle s, \triangleright \rangle, \triangleright$ (a temporally indeterminate proposition)

$i =$ the type of time intervals, $s =$ the type of worlds, $t =$ the type of truth values

$\wedge \phi$ (where ϕ is of type t) is an expression of type $\langle s, \triangleright \rangle$ (i.e. a proposition)

$\vee p$ (where p is of type $\langle s, \triangleright \rangle$) is an expression of type t (i.e. a sentence)

the context provided by (6a) because we have just found out that John gave flowers to Mary yesterday. The conditional asserts that the contrasting proposition is true in the actual world at some contextually salient past time (this is due to the presence of *have*). The conditional also asserts that all the relevant worlds in which the antecedent clause proposition is true are worlds in which the consequent clause proposition is true. This means that if (6a) is true, all the relevant worlds in which John gives flowers to Mary tomorrow and John did not give flowers to Mary yesterday are also worlds in which Mary is happy.

Ogihara's contribution to the debate around examples like (6) can be summarized as follows: (i) examples like these have focus in the antecedent clause and presuppose that context provides a proposition that contrasts with the antecedent clause proposition, (ii) examples like these have a silent *instead* in the antecedent clause that asserts that the antecedent clause proposition is true and the contrasting proposition is false, (iii) in examples like these the past perfect provides the temporal interval at which the contrasting proposition is true in the actual world.

4.2.1.2 Discussion

In this section I would like to comment on some aspects of Ogihara's proposal. I will begin with empirical matters, and note a concern raised by Ippolito (2003) regarding the accuracy of Ogihara's predictions. Ippolito argues that the claim that the perfect provides the actual world location for a contextually given contrasting proposition is actually incorrect. In some cases the (intuitively) contrasting proposition is not true in the actual world at all. Ippolito presents the following example:

(8) Imagine the following scenario: Charlie died a month ago before ever going to New York and both Lucy and Sally know it. Lucy and Sally are talking about him and Lucy says that she believes that if Charlie had gone to New York today, he would have met his friends. Sally disagrees and she utters (12):

(12) No. If Charlie had gone to New York TOMORROW_F, he would have met his friends.

Again, by hypothesis, no proposition of the form ‘that Charlie went to New York at x’ is true, because he never went to New York. The alternatives that are considered are themselves hypothetical and they do not have to hold in the actual world.

(Ippolito 2003)

Ippolito’s example shows that the claim that the past perfect locates the contrasting proposition in the past in the actual world is not quite right.

There is a further empirical concern which has to do with whether there need be a contrasting adverb at all. Below is an example inspired by Dudman (1984):

(9) Suppose that Grannie has passed away. She won't go to the rally tomorrow. But she was very energetic and lively, and we know that:

If Grannie had gone to the rally, she would have been arrested.

The conditional in (9) has the crucial property of (6) (and (2)): it makes a hypothesis about a contrary to facts state of affairs and it has past perfect morphology in an antecedent clause that makes a hypothesis about a future event. But (9) does not contain any temporal adverbial. Moreover, it is not the case that the utterance of (9) presupposes that Grannie went to some past rally or that somebody else will go to the rally. In fact, it is hard to imagine that (9) presupposes anything other than the existence of Grannie at the hypothetical future rally-time. The conclusion is that the notion of *contrast* as understood by Ogihara does not seem sufficient to explain what is going on in the general case. This means that we do not explain the role of the perfect in examples like (2)/(6) by saying that it spells out the temporal parameter of a contrasting proposition.

But even if we limit ourselves to conditionals with contrastive focus in the antecedent clause, it turns out that Ogihara’s theory does not provide a complete account. Consider the examples in (10), discussed (originally) in Dretske (1972), Rooth (1985), and reviewed in Ogihara (2000):

(10) a. If Clyde hadn't MARRIED_F Bertha, he would not have been eligible for the inheritance.

b. If Clyde hadn't married BERTHA_F, he would not have been eligible for the inheritance.

The examples in (10) should be evaluated in relation to the following story:

(11) Clyde, who finds intolerable any sustained involvement with a woman, and thus leads the life of a dedicated bachelor, learns that he stands to inherit a great deal of money at the age of thirty if he is married. He shops around and finds Bertha, an equally dedicated archeologist who spends eleven months out of every year directing excavations in southeastern Turkey. Justifiably expecting that marriage to this woman will leave his life as little disturbed (in the relevant aspects) as any marriage could, he proposes. Bertha accepts and they are married.

(Dretske 1972)

Given the story in (11), Dretske reports the intuition that the conditional in (10a) is true but the conditional in (10b) is false.

Ogihara's proposal for (6) does not (straightforwardly) carry over for (10). Let us examine (10b): we do not understand the antecedent of (10b) to be *if Clyde hadn't married BERTHA instead*. The whole idea of a contrasting proposition is difficult to apply. Suppose that the contrasting proposition *Clyde married X*, where *X* is somebody other than Bertha, were true in the actual world. This is problematic: we can utter (10b) if Clyde did marry Bertha in the actual world, but we do not commit ourselves to Clyde having married both Bertha and the contextually salient alternatives to Bertha. We would not fare much better by allowing the contextually salient proposition to include negation. If we did, (10b) would be felicitous only if some contextually salient proposition of the form *Clyde did not marry X* were true in the actual world at a salient past time. But we can felicitously utter (10b) without it being contextually salient that there was somebody else that Clyde did not marry. Moreover, if we added a silent *instead*, we would end up with a proposition that is true in a world if Clyde did not marry Bertha but instead

married all the contextually salient alternatives to Bertha. The C-set would be {Clyde did not marry Bertha, Clyde did not marry Sue, Clyde did not marry Mary, ...} and the proposition denoted by the *instead*-clause would be true in a world iff the only true proposition in the C-set were that Clyde did not marry Bertha. The *instead*-clause would be true only if he married everybody else. This is not the proposition we want to restrict the modal.

In discussing Dretske's examples, we have come to the conclusion that in such cases focus in the antecedent need not be associated with a silent *instead*, and that there need be no contextually salient contrasting proposition true in the actual world. Basically, the key elements of Oghara's proposal fail to apply.

To sum up: to what extent does Oghara's proposal explain the effect of aspectual morphology on the quantificational domain of the modal? Oghara's proposal has the advantage of being detailed and explicit. However, it doesn't really give us a general account: it doesn't address the difference between (1) and (2) and it does not explain the role of the perfect. We should keep looking for a general, compositional account.

4.2.2 Ippolito 2003

Ippolito 2003 addresses the problem of giving an account of examples like (2) and explaining the contrast between these examples and examples like (1). Ippolito's own examples are given in (12) [(12a) is like (1) and (12b) is like (2)].

We should consider the interpretation of (12) in the following context: Charlie is studying Italian, and he chose to take his Advanced Italian test last Monday. Unfortunately, he did not pass. If he had taken the exam a few days later, he would have benefited from the extra study, and he would have passed.

(12) a. **Non-past conditionals**

#If Charlie took his Advanced Italian test tomorrow, he would pass.

b. **Mis-matched past counterfactuals**

If Charlie had taken his Advanced Italian test tomorrow, he would have passed.

In the context mentioned above, (12a) is very odd. In order to felicitously make a counterfactual hypothesis about an alternative test time, it is necessary to use past perfect tense morphology in the antecedent clause, as in (12b). This is exactly the pattern that we have already seen in (1) and (2). I will present and discuss Ippolito's proposal in some detail.

4.2.2.1 The proposal

Ippolito derives the contrast between (12a) and (12b) from the interaction between semantic and pragmatic factors. Her theory has both a semantic and a pragmatic component. The semantic component of Ippolito's theory deals with the problem of giving truth conditions for conditionals, and figuring out the syntax semantics interface and the role of tense. The pragmatic component of Ippolito's theory deals with the presuppositions of conditionals.

I will begin with the semantics of modals. Ippolito treats modals as quantifiers over possible worlds. The interpretation of *must* is presented in (13) as an example. The interpretations of other modals will have a similar shape:

$$(13) \quad [[\mathbf{must}]] = \lambda p \in D_{\leq_s, \triangleright} \lambda q \in D_{\leq_s, \triangleright} \forall w \in W (p(w) = 1 \rightarrow q(w) = 1)$$

(Ippolito 2003)

Must combines with two propositions to yield a truth value. The truth value will be true iff all the worlds in the extension of the first proposition are also in the extension of the second proposition. The first proposition $[p]$ establishes the quantificational domain of the modal. In part this proposition will be determined by an accessibility relation R that picks out a set of relevant worlds and in part by the antecedent clause [we will see the details of how this works later on]. The second proposition $[q]$ corresponds to the consequent clause.

Large part of the semantic work in Ippolito's proposal is done by the characterization of the accessibility relation for the modal, and its interaction with tense. Depending on the type of modality, the accessibility relation makes available worlds that correspond to our knowledge, belief, desire, etc. As Ippolito points out, knowledge,

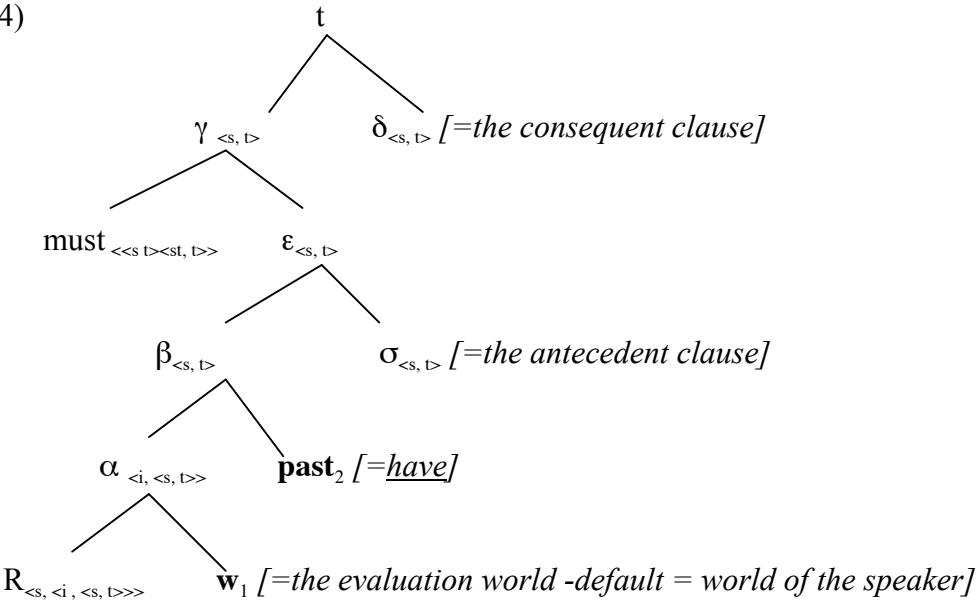
beliefs and desires change over time. Therefore, the domain of modals sensitive to such attitudes will also change over time. And not only do attitudes change over time, Ippolito considers that the world too changes over time. According to Ippolito, the world now may be different from what it used to be. What was compatible with our knowledge, desire, beliefs or the world itself in the past may no longer be so in the present.

Ippolito considers that the correct characterization of the accessibility relation must be time-sensitive. The accessibility relation must be (at least) a relation between a world-time pair and a world. The type of R must be $\langle s, \langle i, \langle s, t \rangle \rangle \rangle$, where i is a member of I, the domain of times. The modal will quantify over a set of worlds that will be identified relative to a world and an evaluation time. In the default case, the temporal argument of the accessibility relation will be the speech time. But in some cases the temporal argument can be given by a past tense. Ippolito's claim is that tense can appear either in the restrictor of the modal or in its nuclear scope. If a past tense appears in the restrictor of the modal, it will provide the value of the temporal argument of the R relation.

Ippolito does not distinguish between past tense and perfect *have*. She treats perfect *have* as an instance of past tense. In examples like (12b) perfect *have* provides a past temporal argument for the accessibility relation.

The ingredients of Ippolito's analysis are put together in the following way: let us say that we are considering a conditional of the form *if* γ , *must* σ in which a past tense provides the temporal argument for the accessibility relation R. The LF structure of the conditional will be as in (14):

(14)



The interpretation of the node β will be the set of propositions corresponding to the accessibility relation in w_1 at some contextually salient past time. If the accessibility relation is epistemic, for example, this will be the set of proposition corresponding to what was known at that past time. If the accessibility relation is 'realistic', it will be the set of proposition corresponding to the state of the world at that past time.

The interpretation of the node ϵ is achieved by intersecting the proposition corresponding to the accessibility relation β with the proposition corresponding to the antecedent clause σ (the semantic operation needed to compute the interpretation of this node is 'Predicate Modification', see Heim and Kratzer (1998)). The interpretation of ϵ will be the proposition that is true in all the worlds accessible from w_1 at the past time past_2 that are also worlds in which the antecedent clause is true. The perfect, that is found in the antecedent clause in the surface structure, is interpreted outside the antecedent clause, as the past temporal argument of the accessibility relation.

Given these assumptions about LF, the truth conditions derived for (12b), repeated below, will be as in (15):

(12b) If Charlie had taken his Advanced Italian test tomorrow, he would have passed.

(15) $[[S]]^{g, c} = 1$ iff $\forall w \in W [w \text{ is accessible from } g(1) \text{ at } g(2) \text{ and Charlie takes his Advanced Italian test tomorrow in } w \rightarrow \text{Charlie passes in } w]$, defined only if $g(2) < t$, where $g(1)$ is the actual world, t is the utterance time and $g(2)$ is a contextually salient past time.

Let us assume that the modality in (12b) is 'realistic' and the truth value of the conditional depends on events in the actual world. According to (15), the conditional in (12b) is true iff all the worlds w compatible with the actual world at some contextually salient past time in which Charlie takes his Advanced Italian test tomorrow are such that he passes tomorrow.

The difference between a conditional like (12b) and a conditional like (12a) is that in (12a) past tense does not affect the accessibility relation:

(12a) If Charlie took his Advanced Italian test tomorrow, he would pass.

The truth conditions for (12a) are like those of (12b) except that past tense does not constrain the temporal variable in the accessibility relation (note the absence of a perfect in (12a)):

(16) $[[S]]^{g, c} = 1$ iff $\forall w \in W [w \text{ is accessible from } g(1) \text{ at } g(2) \text{ and Charlie takes his Advanced Italian test tomorrow in } w \rightarrow \text{Charlie passes in } w]$, where $g(2) =$ utterance time. (Ippolito 2003)

According to (16), the conditional in (12a) is true iff all the worlds w compatible with the actual world at the speech time in which Charlie takes his Advanced Italian test tomorrow are such that he passes tomorrow.

The difference between (12a) and (12b) arises because of differences in the interaction between the temporally sensitive accessibility relation and tense. Ippolito understands this in the following way: The worlds compatible with the actual world at the speech time are worlds like the actual world up to the speech time. The conditional in (12a) therefore quantifies over worlds in which Charlie has already taken his exam. That

is why it is infelicitous, we do not really care about such worlds. The conditional in (12b) quantifies over a different set of worlds, the worlds compatible with the actual world in the past, but not necessarily at the speech time. In those worlds it is not necessarily the case that Charlie took his exam last Monday. According to Ippolito, some of the worlds compatible with the actual world in the past are worlds in which Charlie did take his exam last Monday (the actual world is an example) and some are worlds in which he did not.

The pragmatic component of Ippolito's theory deals with the presuppositions of conditionals. Ippolito wants to account for the difference between (12a) and (12b) in terms of a pragmatic theory of presuppositions.³⁷

According to Ippolito, in addition to the truth-conditional difference, there is a difference between (12a) and (12b) in terms of their presuppositions. Conditionals like (12a) presuppose that the antecedent is not inconsistent with the context set at the time of utterance (conditionals like (12a) presuppose that the antecedent is consistent with the context set at the speech time). Conditionals like (12b) presuppose that the antecedent is not inconsistent with the context set at some past time. Ippolito states the felicity conditions of the two types of conditionals as in (17), where P is the proposition corresponding to the intersection of the presuppositions of the antecedents of the conditionals, and C_t is the context set corresponding to the common ground at some time t .

(17) a. **Felicity conditions for non-past conditionals**
 $P \cap C_u \neq \emptyset$, where u is the utterance time

b. **Felicity conditions for mis-matched past counterfactuals**
 $P \cap C_{t2 < u} \neq \emptyset$, where u is the utterance time

The fact that there is a difference in the time relevant for the felicity conditions follows from a general hypothesis linking felicity conditions with the temporal argument of the accessibility relation for the modal in a conditional:

³⁷ Ippolito also provides a pragmatic account of the intuition that the antecedent clause in mis-matched past counterfactuals is false. I will set this issue aside here.

(18) **Hypothesis**

The time relevant for the felicity conditions of a subjunctive conditional is identical to the value of the time argument of the accessibility relation.

(Ippolito's (41))

Ippolito's proposal makes the prediction that the common knowledge at the speech time should be irrelevant to the felicity of mismatched past counterfactuals, but should be relevant to the felicity of non-past subjunctives. This is illustrated the examples below:

(19) a. Charlie is dead. If he came to the party tomorrow, he would meet Sally.
b. Charlie is dead. If he had come to the party tomorrow, he would have met Sally.

Coming to the party presupposes being alive. The conditional in (19a) will only be felicitous if the presupposition is compatible with the common ground at the speech time. As predicted by (17), the example is infelicitous because at the speech time it is known that Charlie is dead. The intersection between the proposition that is presupposed and the common ground at the speech time is the empty set. The conditional in (19b) will only be felicitous if the presupposition is compatible with the common knowledge at some past time. As predicted by (17), the example is felicitous because there is some contextually salient past time such that the intersection between the presupposed proposition and the common ground at that time is not the empty set. Presumably, this will be a time before we learn that Charlie is dead.

The main points of Ippolito's proposal can be summed up as follows: (i) the quantificational domain of the modal in conditionals is partly determined by a time-sensitive accessibility relation R , (ii) perfective *have* in the antecedent clause can be interpreted outside the antecedent clause proposition, as the temporal argument of the accessibility relation, (iii) because of the hypothesis in (18), the presuppositions of conditionals depend on the presence of perfective morphology in the antecedent clause.

4.2.2.2 Discussion

I would like to discuss two aspects of Ippolito's proposal. One is the idea that perfect *have* is simply a past tense that is interpreted outside the antecedent clause proposition, as the temporal parameter of the accessibility function (this idea is intuitively similar to Condoravdi's proposal discussed in Chapter 2). The other is the idea that the difference between simple and perfect conditionals should be characterized in terms of the time at which presuppositions are satisfied. I will show that these ideas are not quite right.

Let us begin with the idea that perfect *have* is interpreted as a past tense outside the antecedent clause proposition. Data from adverbial clauses suggests that this is incorrect. Let us start with *since*-clauses. In English, *since*-clauses are only compatible with perfect tenses :

(20) a. Mary has lived in Amsterdam since 1975.
b. Mary had lived in Amsterdam since 1975,
c. Mary will have lived in Amsterdam since 1975.
(Kamp and Reyle 1995: 628)

As we see in (20), *since*-clauses are compatible with past, present and future perfect constructions. But as the contrast with (21) illustrates, they are not acceptable with simple, non-perfect tenses:

(21) a. *Mary lives in Amsterdam since 1975.
b. *Mary lived in Amsterdam since 1975.
c. *Mary will live in Amsterdam since 1975.

And yet, *since*-clauses are perfectly acceptable in the antecedent clause of past perfect *would*-conditionals, suggesting that the perfect is interpreted within the antecedent clause. This is illustrated by (22) and (23) below:

(22) A: It's a pity the doctor didn't know her for very long.

B: Why?

A: Well, if he had known her since she was a child, for example, he would have known that she was allergic to penicillin.

(23) If you had lived in this house since 1963, you would have qualified for a rent subsidy.

An additional argument can be made with *for*-clauses. To see this, consider the interpretation of the perfect of stative verbs in English. In English, perfects of stative verbs can be interpreted in two ways:

(24) Mary has lived in Amsterdam for three years.

- somewhere in the past there was a three year period during which Mary lived in Amsterdam
- Mary is living in Amsterdam now and this state has been going on for three years

(Kamp and Reyle 1995: 567)

We are interested in the interpretation in (24b), in which the *for*-clause modifies the duration of the state corresponding to the perfect. This interpretation is also available for perfects in the antecedents of past perfect *would*-conditionals:

(25) a. If you had worked here for three years, you would have gotten a raise.
b. If you had known her for as long as I have, you wouldn't have made that mistake.

We can interpret (25a) as making a hypothesis about a situation in which you are currently working here, and you started three years ago. Similarly, we can interpret (25b) as making a hypothesis about a situation in which you currently know her, and you became acquainted with her at the same time I did. If we accept that in these interpretations the *for*-clause modifies the state introduced by the perfect (as suggested by

Kamp and Reyle (1995)), then it is clear that the perfect must be part of the antecedent clause.

Let us turn now to the idea that the difference between simple past and past perfect conditionals has to do with the conversational context in which presuppositions are satisfied. Ippolito states the felicity conditions of conditionals in terms of compatibility between the presuppositions of the antecedent and the context of evaluation. However, classic work in presupposition projection in context change semantics adopts a stronger condition on the relationship between presuppositions and context.³⁸ According to the pragmatic account of presuppositions found in Heim (1992), for example, presuppositions have to be entailed by the context set. Compatibility is not enough. The general (and simplified schema) for updating a context with a sentence that carries a presupposition that is adopted by Heim (1992) is given in (26), where the sentence α presupposes the proposition β :

$$(26) \quad c + \alpha \text{ is felicitous only if } \{w: w \in c\} \subseteq \{w: w \in \beta\}, \text{ if felicitous} \\ c + \alpha = c' = \{w: w \in c \ \& \ w \in [[\alpha]]^c\}$$

According to (26), updating a context with a sentence can only be felicitous if the context entails the presuppositions of the sentence. If the update is felicitous, the result of performing the update operation will be to obtain a new context that corresponds to the intersection of the old context and the proposition denoted by the updating sentence. The proposal in (26) places stronger conditions on the felicity conditions of a sentence than the ones adopted by Ippolito, since it requires that the presuppositions be entailed instead of being merely compatible.³⁹ If Ippolito had adopted the stronger condition, the felicity conditions for the conditionals in (12a) and (12b) would have been (27) instead of (17):

³⁸ See Beaver (1995) for overview.

³⁹ There are arguments that a stronger condition is needed. If it were the case that presuppositions only had to be *compatible* with common knowledge, instead of entailed by common knowledge, then the utterance of a presuppositional expression, such as the possessive *my sister* would not require that we know that I have a sister. It should be possible to *learn* that I have a sister after the DP were used.

(27) a. **Felicity conditions for non-past conditionals**

$C_u \subseteq P$, where u is the utterance time

b. **Felicity conditions for mis-matched past counterfactuals**

$C_{t2 < u} \subseteq P$, where u is the utterance time

Why doesn't Ippolito adopt felicity conditions like the ones in (27)? Such conditions would make incorrect predictions. The proposal would not be able to make sense of information growth at all. Let us consider one of Ippolito's examples again:

(19) a. #Charlie is dead. If he came to the party tomorrow, he would meet Sally.
b. Charlie is dead. If he had come to the party tomorrow, he would have met Sally.

Coming to the party tomorrow presupposes being alive tomorrow. In (19), the conditionals are uttered in a context in which we know that it is not true that he is alive tomorrow. How would the felicity conditions in (27) deal with (19)? (19a) would, correctly, be predicted to be infelicitous. The presuppositions of the antecedent clause are not entailed by the conversational background at the speech time. But (19b) would also be predicted to be infelicitous. This is because of the way information grows. If we currently know that Charlie is dead, it cannot be the case that at some past time we knew that he was alive tomorrow. Given standard views about information growth, what we currently know is a subset of what we knew in the past. But if it is not the case that at some point in the past we knew that Charlie was alive tomorrow, then there is no past context that entails the presuppositions of the antecedent. The condition $C_{t2 < u} \subseteq P$ won't be satisfied by any past time.

It is clear why Ippolito states the felicity conditions in terms of compatibility instead of entailment. But we can wonder whether the felicity conditions thus obtained are strong enough, even if we only consider the case of conditionals. Look at the examples below:

(28) a. #Nobody saw the robbery. If the witness had managed to see the thief's face, he would have been apprehended.

b. #George does not live in California. If Sara had known that George lives in California, she would have visited him.

The antecedents of the conditionals in (28) carry presuppositions: in (28a) there is a definite description, which presupposes existence and uniqueness, and in (28b) there is a factive verb, *know*, which presupposes the truth of its complement. Ippolito does not claim that the felicity conditions in (17) work for all presuppositions. But she does give examples with definite descriptions, so these fall within the scope of her proposal. She does not give examples with factive verbs so it is not clear whether she would consider this example to fall within the scope of her proposal. But she does not discuss the possibility that different kinds of presupposition triggers would behave differently.

According to Ippolito, the conditionals in (28) should be felicitous if the presuppositions are compatible with some previous context. As in the examples in (19), it is clear what that context would be like: for (28a) we need the context before we learned that nobody saw the robber, and for (28b) we need the context before we learn that George does not live in California. As in (19), the relevant context is the context just before the utterance of the first sentence. But for some reason, these examples do not work. Even though there is a past context compatible with the presuppositions in each case, the conditionals are not felicitous.

The examples in (29) are there to make the point a bit clearer:

(29) a. There was a robbery last night. If the witness had managed to see the thief's face, he would have been apprehended already.

b. #There was a robbery last night. Nobody saw it happen. If the witness had managed to see the thief's face, he would have been apprehended already.

The example in (29a) shows us that the context obtained by updating with the sentence *There was a robbery last night* can accommodate the presuppositions of the definite description *the witness*. The presuppositions of the description are at least compatible

with that context. The example in (29b) shows that once we have carried out the further update with the sentence *Nobody saw it happen*, the presuppositions cannot be accommodated. This is a problem. If all that was required for the felicity of the counterfactual was compatibility with some previous context, (29b) should be fine.

Let me try to sum up the discussion in this section. As we have seen, Ippolito's idea that the perfect is interpreted outside the antecedent clause is problematic. Moreover, her characterization of the felicity conditions of simple past and past perfect counterfactuals makes incorrect predictions. So even though Ippolito's proposal has the great advantage of seeking a compositional account of the interpretation of simple past and past perfect conditionals, there is arguably still work to be done.

4.3 The interpretation of simple *would*-conditionals

We have seen that aspect in the antecedent clause affects the range of interpretations available to *would*-conditionals. As Lewis pointed out, examples with simple past tense eventive verbs appear similar to indicative conditionals. Past tense statives and perfects, on the other hand, manage to achieve a 'real counterfactual' interpretation.

In this section I will propose an analysis according to which the crucial player is perfective aspect. The difference between the simple past tense eventives vs. the other ones will be derived from the fact that aspect in the case of the eventives is perfective, while in the stative and perfect examples, it is not.

In §4.3.3 I will propose an interpretation of perfective aspect according to which it introduces a free event variable. The denotation of this variable will be an actual world event that fits the description provided by the VP. I will suggest that the way we identify events across worlds is sensitive to properties of the events in the actual world. In particular, cross-world identification of events is sensitive to temporal location.

Let's consider an example: suppose that your plants died yesterday. The identification of this event in another world requires finding an event in the other world that also took place yesterday. If we are looking at a world in which your plants died tomorrow instead of yesterday, for example, we will not find this event. Of course, we will still find the event of your plant's dying in such worlds! But, I am suggesting, it won't

be this event of your plant's dying. The crucial property of perfective aspect, in my proposal, is that it by introducing a free variable, it also introduces a deictic (demonstrative?) dimension into the interpretation of the antecedent clause. When aspect is perfective, we are making deictic reference to an actual world event, and the possibility of identifying this event in other worlds depends on there being events in the other worlds that fit the (temporal) actual world parameters of the event (cross-world identification of the value of e is done via a sort of highly restricted counterpart relation).

In order to fully defend this deictic view of perfective aspect, more work is needed than the one I will manage here. However, I hope to show that it is an interesting way of thinking about the difference between *would*-conditionals that allow for a 'real counterfactual' interpretation, and the ones that don't.

4.3.1 States vs. events

The central piece in my analysis of the role of aspect in *would*-conditionals will be the interpretation of perfective aspect and the idea that stative and perfect clauses are not perfective. My perspective on stative clauses themselves will be somewhat simple-minded. I will adopt the view that stative clauses differ from eventive clauses at the level of logical form, with stative verbs characterized as properties of times. This particular characterization of statives, however, is not crucial. What really matters is that stative clauses are not perfective. To show some of the complexities underlying the issue, I will present my characterization of stative verbs together with a brief glimpse into proposals that argue for a different kind of distinction.

4.3.1.1 Preliminaries

Part of the study of aspect corresponds to the study of the basic properties of verbal predicates. Vendler's influential 1967 classification divided verbs into four groups: states, activities, achievements, and accomplishments. The classification is supported on the basis of a series of tests (e.g. the *for*-test, the *in*-test, the progressive test) (see Dowty 1979).

Some authors, such as Parsons, have argued for a fundamental distinction between states and events (the non-stative eventualities). Working within a neo-

Davidsonian framework, Parsons establishes a basic ontological difference between states and events: the difference between states and events is a sortal property. They are two different kinds of things (see also Kratzer (2001)). Other authors, such as Katz, have argued for a distinction between stative and eventive sentences without acknowledging an ontological distinction between states and events. Katz (1995) has argued that there is a difference in the logical form of stative and eventive sentences. I will follow Katz in thinking that there is a difference between stative and eventive sentences, without committing myself to a sortal difference between states and events. However, this is not crucial, and the basic idea could be adapted to a system that acknowledged states.

4.3.1.2 Katz (1995)

According to Katz (1995) eventive sentences and stative sentences differ in terms of quantificational force. Eventive sentences make existential claims about events. Stative sentences, on the other hand, do not make existential claims about states. Stative sentences simply 'hold' at a time.

Katz supports the distinction in quantificational force with various arguments, one of which comes from the possibility of event anaphora: eventive sentences support event anaphora, while stative sentences do not. This is illustrated in (32) and (33):

(32) a. Kim kissed Sandy.
b. It bothers Sue.
c. It was at noon.

(33) a. Kim loves Sandy.
b. It bothers Sue.
c. *It was at noon.

(Katz 1995: 39)

As the (b) examples show, both eventive and stative sentences support propositional anaphora. But, as the (c) examples show, only eventive sentences support event anaphora.

Even though these examples are not fully convincing⁴⁰, I will adopt Katz's idea that stative sentences do not quantify over states. However, before moving on, I would like to briefly discuss the alternative position in order to have some idea about why one might wish to say that stative sentences quantify over states.

According to Parsons (1990), there isn't a (big) difference in the logical form of stative and eventive sentences. Eventive sentences are about events, and stative sentences are about states. There is, however, an ontological difference between states and events. They are different kinds of eventualities. It is worth pointing out, however, that Parsons himself notes that the evidence supporting the position that sentences with stative verbs are about states is less convincing than the one supporting the corresponding claim about eventive verbs and events.

Let us start by reviewing the arguments that support an event-based analysis of eventive sentences, to then consider their extension to the case of states. Inspired by Davidson, Parsons uses two basic arguments: an argument from the logic of modifiers and an argument from the interpretation of perception reports.

The argument from the logic of modifiers favors adopting an event based semantics for eventive verbs because of the interpretation of sentences like (34):

(34) Brutus stabbed Caesar in the back with a knife. (Parsons 1990: 13)

From (34) it is possible to infer that Brutus stabbed Caesar, that he stabbed him in the back, and that he stabbed him with a knife. Following Davidson (and modifying the original proposal to a neo-Davidsonian analysis), Parsons concludes that this is evidence in favor of an analysis like (35):

(35) $(\exists e) [Stabbing(e) \& Subject(e, Brutus) \& Object(e, Caesar) \& In(e, back) \& With(e, knife)]$ (Parsons 1990: 14)

⁴⁰ One could wonder, for example, about cases like (ii):

(i) Kim loved Sandy for many years.
(ii) Kim loved Sandy. It lasted many years.

By adopting a ‘conjunctive’ analysis along the lines of (35), it is possible to explain why we are able to draw inferences from (34). The inferences correspond to the different conjuncts in (35).

Parsons points out that it is difficult to make a similar argument with stative verbs. Stative verbs do not easily combine with multiple modifiers. The example that he thinks is the most convincing is given in (36), yet even this example does not provide convincing support for a state-based analysis:

(36) Consider a TV set perched between a desk and a table that almost touch one another. The following might be true:

The TV sits on the desk by the lamp.

The TV sits on the table by the computer.

These should not entail that

The TV sits on the desk by the computer.

These seem to be naturally interpretable as two sittings (two situations), one on the desk and by the lamp, and another on the table and by the computer.

(Parsons 1990: 189)

As Parsons points out, examples like these do not argue in favor of a state-based analysis of stative verbs analogous to the event-based analysis exemplified in (34). We do not interpret the state modifiers as independent conjuncts that can be freely recombined. (Of course examples like this do not argue against the idea that there are states either!).

Let us examine now the argument from perceptual reports. Perceptual reports are sentences that consist of a perception verb and a tenseless complement clause. Examples are given in (37):

(37) a. Mary saw Brutus stab Caesar.
b. Sam heard Mary shoot Bill.
c. Agatha felt the boat rock.

(Parsons 1990:15)

Following Higginbotham (1983), Parsons proposes an analysis of (37a) according to which the sentence makes the claims in (38):

(38) $\exists e [\text{Seeing } (e) \& \text{Subject } (e, \text{Mary}) \& \exists e' [\text{Stabbing } (e') \& \text{Subject } (e', \text{Brutus}) \& \text{Object } (e', \text{Caesar}) \& \text{Object } (e, e')]]$ (Parsons 1990: 17)

According to (38), (37) is true if there is an event of seeing, with Mary as the subject, that has as its object an event of Brutus stabbing Caesar.⁴¹

Perceptual reports support an event-based analysis of eventive verbs because such an analysis allows for an insightful analysis of perceptual reports themselves. They also provide evidence in favor of a state-based analysis of stative verbs, but Parsons considers the evidence to be indirect and rather weak. One of the difficulties is that verbs that make reference to mental states, usually unobservable, are not very happy in the complement clause of perceptual reports. Still, this is a rather accidental matter, which Parsons works around:

(39) One can imagine a future development of neuropsychology in which people develop indirect ways to test for such states; they might very well say “For two continuous hours we watched the patient hate her mother.” If these make sense, and I think they do, then the occurrence of perception verbs provides weak and indirect but confirming evidence for an underlying state analysis of such contexts. (Parsons 1990: 190)

According to Parsons, examples like this suggest that we do need to allow states to be the object of perceptual reports.

4.3.2 The case of states

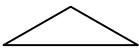
I will follow Katz in making a distinction in the logical form of eventive and stative sentences. This distinction will follow from a more basic distinction in the

⁴¹ This analysis improves over alternatives mentioned by Parsons, and passes a variety of tests proposed in Barwise (1981).

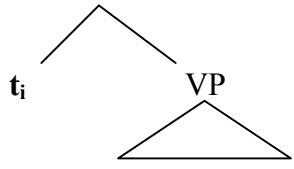
semantics of eventive and stative verbs. I take it that eventive verbs denote properties of events, while stative verbs denote properties of times.

My treatment of stative verbs is inspired by Katz proposal, but differs in details of implementation. One difference is that I introduce predication over times and temporal variables directly into the semantics of English.⁴² The temporal parameter of an eventuality is provided by expressions of English, not by an evaluation time parameter in the interpretation function.

Following the idea that stative verbs denote properties of times and eventive verbs denote properties of events, I propose that stative VPs have the denotation given in (40) [for the sake of simplicity, I am assuming that all the arguments are within the VP]:

(40) VP

your plant is healthy
 $\lambda t \lambda w [\text{your-plant-is-healthy}(t)(w)]$

The difference between stative and eventive verbs in terms of the type of denotation makes predictions about the interaction between the VP and tense. In a referential theory of tense, tenses denote temporal intervals. As such, they can combine with stative VPs directly:

(41) a. TP

your plant is healthy
 $\lambda t \lambda w [\text{your-plant-is-healthy}(t)(w)]$

b. $[[_{\text{TP}} t_i [_{\text{VP}} \text{your plant is healthy}]] =$
 $\lambda w [\text{your-plant-is-healthy}(t_i)(w)]$

The T(ense) P(hrase) in (41a) denotes the proposition in (41b). This is the proposition that is true in a world if the time t_i has the property of being a time at which your plant is healthy. When the TP functions as an *if*-clause, the temporal argument is abstracted over, and the denotation is a property of times: $\lambda t \lambda w [\text{your-plant-is-healthy}(t)(w)]$.

Let us turn back to the interpretation of conditionals. We are interested in the interpretation of the conditional in (4):

(4) Suppose you keep your plants in a dark closet in the kitchen, and are worried because they are not growing. I can see what is going wrong:

You: I am worried about my plants.

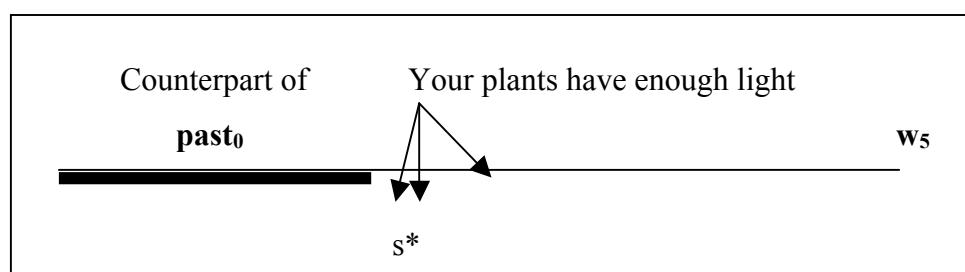
Me: Oh, they simply do not have enough light. If they had enough light, they would be fine.

As we have seen [Chapter 2], modals combine with properties of times and locate the evaluation time of the antecedent *if*-clause at a salient non-past time. The modal in (4) quantifies over worlds that include a counterpart of the actual world past in which (42) is true:

(42) $\lambda w [\text{your-plants-have-enough-light}(t)(w)]$

where t is a non-past time.

These are worlds in which a non-past time has the property of being a time at which your plants have enough light. These will be worlds like w_5 below:



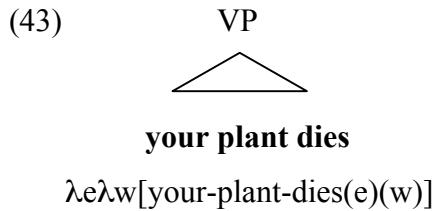
⁴² See a.o. Kusumoto (1998) for discussion.

The conditional claims that in the worlds in the quantificational domain of the modal, the plants will be fine. The quantificational domain of the modal may or may not include the actual world (depending on whether your plants have enough light or not). This explains why (4) can be true when the antecedent is false.

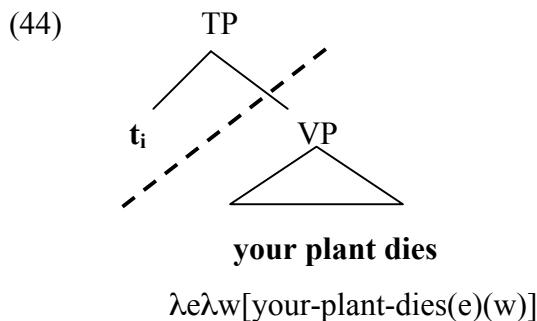
We now face the difficult task of explaining how (4) differs from (1)/(3). We must turn to the case of events.

4.3.3 The case of events

I will adopt an event-based analysis of eventive verbs (see Davidson for arguments in favor of events, and a.o. Parsons (2000), Kratzer (2001)). Eventive VPs denote properties of events. A schema of an eventive VP is given in (43):



Given the proposal above, eventive VPs cannot combine with tense directly. They are not of the correct type: they do not take times as arguments. Attempting to combine an eventive VP with tense directly results in semantic ill-formedness:



I will follow Kratzer 1998 in assuming that aspectual heads are responsible for mapping properties of events into properties of times. Aspectual heads provide the link

between eventive VPs and tense. (In part) they are responsible for fixing the temporal perspective from which an event is viewed (they specify the ‘viewpoint’ aspect). Perfective aspectual heads locate the duration of an event within a time:

Perfective viewpoints present situations as punctual. The impression of punctuality arises from the closed nature of the perfective presentation. We conceive a punctual situation as a simple, closed structure which appears at a point in time. (Smith 1991: 104)

Imperfective aspectual heads locate a time within the duration of an event

Imperfective viewpoints present part of a situation, with no information about its endpoints. Thus imperfectives are open informationally. The unmarked imperfective spans an interval that is internal to the situation. (Smith 1991: 111)

This basic contrast captures the often quoted intuition that perfective aspect allows us to look at events as if they were completed, or ‘from the outside’, while imperfective aspect allows us to look at an event as if it were ongoing, or ‘from the inside’.

English does not always mark aspect overtly. In the absence of overt morphological marking, I have proposed that the aspectual head responsible for mapping properties of events onto properties of times is a perfective head. As we have seen in Chapter 1, arguments in favor of this view can be found in Bennett and Partee (1978). Bennett and Partee argue that the aspectual restrictions on the present tense in English (e.g. **She eats an apple*) can be derived from the fact that events are not small enough to fit into the speech time. Their idea is that events need to fit ‘inside’ the temporal interval corresponding to tense. This means that the default aspect is perfective.⁴³

In my analysis, perfective aspect is deictic. For this reason, the interpretation of perfective clauses is tied to worlds in which the relevant event shares the properties of the actual world event. Perfective aspect has this effect on the interpretation because it introduces a free event variable that ‘anchors’ the interpretation to the actual world event:

⁴³ See Arregui 2000.

(45) Where P is a property of events, and e is a variable ranging over events

$$[[\emptyset_{\text{perfective}} - e]]^g(P) = \lambda t \lambda w [P(g(e))(w) \& \text{running-time}(g(e)) \subset t]$$

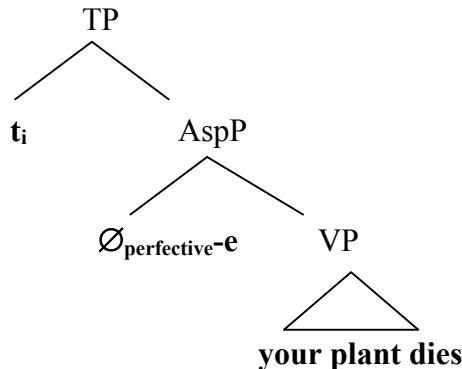
(adapted from Kratzer 1998)

The proposal in (45) is an adaptation of the denotation for perfective aspect found in Kratzer 1998. The difference is that in Kratzer's proposal the perfective head existentially binds off the event variable. In my adapted version, the perfective head introduces a free event variable, resulting in a 'deictic' aspect.

When an eventive VP combines with perfective aspect and tense, the result is an LF like the one in (46a), with an interpretation like in (46b):

(46)

a.



$$\lambda e \lambda w [\text{your-plant-dies}(e)(w)]$$

b. $[[_{\text{TP}} t_i [_{\text{AspP}} \emptyset_{\text{perfective}} - e [_{\text{VP}} \text{your plant dies}]]]] =$

$$\lambda w [\text{your-plant-dies}(g(e))(w) \& \text{running-time}(g(e)) \subset t_i]$$

According to (46b), the $\text{TP} [t_i [_{\text{AspP}} \emptyset_{\text{perfective}} - e [_{\text{VP}} \text{your plant dies}]]]$ denotes the proposition that is true in a world if the event e has the property of being an event of your plant dying with a running time included in t_i . When the TP functions as an *if*-clause, the

⁴⁴ Properly speaking, in my framework, the claim shouldn't be that the running time of e is a *subset of* t , but rather, that it is a *part of* t . I am ignoring this subtlety, though doubtlessly it requires more work.

temporal variable is abstracted over, resulting in a property-of-times denotation: $\lambda t \lambda w [\text{your-plant-dies}(g(e))(w) \ \& \ \text{running-time}(g(e)) \subset t]$.

There are many ways of thinking about events. In his analysis of causation, Lewis characterized events as properties of worlds. I am not thinking of events in this way. In my analysis, the variable e ranges over events construed as individuals parts of worlds. When we say that 'this event' (e) happens in another worlds, we match up this event with events in other worlds. My claim is that this matching between events can only be done in such a way that the temporal parameter of the event is construed as an essential property of the event - it will not vary from world to world. An event in another world wouldn't be 'this event' if it took place at a different time.

The criteria for identifying the value of e across worlds is very strict. It seems stricter than the similarity requirement imposed on counterpart relations as we usually think of them. And the severity may seem rather artificial. After all, we can make hypothesis about alternatives times for events. It is obviously true that *your plant's death could have taken place next week instead of last week* or that *your plants could have died next week instead of last week*. However, the truth of these examples does not run counter to the claim that we identify the values of free event variables across possible worlds with the assumption that the temporal location of events stays the same. Examples like these could have logical forms that do not include free event variables. As such, they would not be counterexamples.

Why does perfective aspect have such a particular effect on the interpretation of *would*-conditionals? When we restrict the quantificational domain of the modal with something like (46b), that has a free event variable, the modal will quantify over possible worlds in which there is a match for the actual world event of your plants dying. The proposition corresponding to the antecedent clause will only be true in such worlds. To see what this means, let us go back to (3):

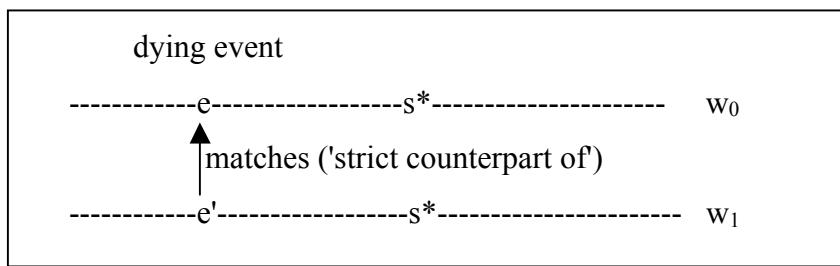
(3) Me: I am rather relieved that your plants died yesterday. #If they died next week (instead), I would be very upset.

Given what I said in Chapter 2, the modal in (3) quantifies over worlds that contain a counterpart of the actual world past in which (47) is true:

(47) *Where e is an actual world event and t is a non-past time,*
 $\lambda w[\text{your-plant-dies}(e)(w) \ \& \ \text{next-week}(e)(w) \ \& \ \text{running-time}(e) \subseteq t]$

The event variable in (47) refers directly to an actual world event. In the relevant sense, this makes the interpretation of the antecedent clause in (3) 'deictic': it can only be interpreted by making direct reference to contextually supplied parameters. The antecedent clause could be paraphrased with something like: *if this (the event of your plants dying) took place next week.*

The free variable in (47) refers to the actual world event of your plant's dying. The proposition in (47) is true in a world w' distinct from the actual world if the event matching your plants dying in the actual world takes place next week in w' . Why can't we obtain a regular counterfactual interpretation in (3)? Why doesn't the modal simply quantify over the worlds in which your plants die next week instead of in the past? Well, if your plants have actually died in the past, the events that match the actual world death in other worlds will also take place in the past. My claim is that the matching relation that identifies e in other worlds does not match e with non-past events:



Given that your plants have died in the past in the actual world, the dying event will not be matched with events in the future. I think this is what goes wrong in (3). In order for the proposition in (47) to be true in a world, the real world event of your plants dying would have to have been matched with events in the future. This doesn't happen. The result is that the quantificational domain of the modal in (3) is empty.

It is interesting to see that, given the deictic nature of perfective aspect, the antecedent clause in (3) will correspond to different propositions depending on the actual world properties of the event of your plant's dying. If the plants have actually died in the past, then the antecedent clause proposition will be true in the actual world and in worlds in which there is a matching event of the plants dying in the past. If the plants actually die in the future, then the antecedent clause proposition will be true in the actual world and in world in which there is a matching event of the plants dying in the future. The proposition expressed by (47) depends on what is going on.

Let me try to refine this idea a little, and turn finally to the contrast between (3) and (1). How does the story so far help us to understand the difference between (3) and (1) (repeated below)?

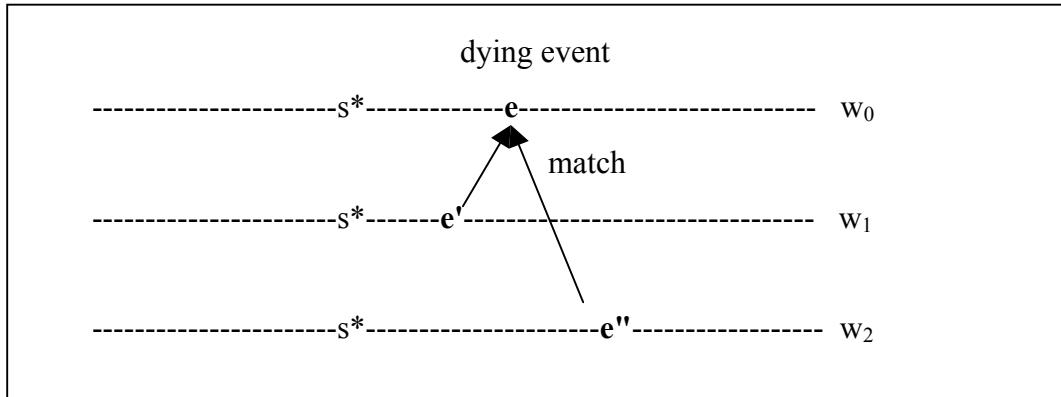
(1) Suppose you will go on holidays next week, and ask me too look after your plants. I accept, but feel rather nervous. I am not very good with plants.

You: Could you look after my plants next week while I am away?

Me: Of course, but I am rather nervous. If your plants died next week, I would be very upset.

In both examples, the modal quantifies over worlds in which (47) is true. But the proposition that is actually denoted by (47) is different in the two contexts.

In the scenario described by (1), there isn't an actual world event of your plants dying in the past (let us grant that the plants are alive when you ask me to look after them). The plants will die in the future. We don't know when. I am worried about the possibility that it will be next week. The matching relation that finds *e* in other worlds is sensitive to what we know about *e* in the actual world. This makes sense if we think of the matching relation as a 'strict' counterpart relation. The matching of events preserves the (temporal) parameters that are familiar to us. If the possibility that the plants die in the future (next week) is a real epistemic option, then the actual world event will be matched with future plants-dying events in other worlds, no matter what the actual world properties of *e* are (that is, no matter whether *e* actually happens in the future or past):



In the context provided by (1), the proposition corresponding to the antecedent clause in (3) could be true in worlds like w_1 and w_2 .

In the case of (3), we know that your plants have died in the past. The strict counterpart relations available to e are such that they will not admit a future event as a match for the actual world event. In this context, the proposition corresponding to the antecedent clause will not be true in any world. In the context in (3), (47) does not provide a felicitous way of restricting the quantificational domain of the modal.

The matching relation that identifies actual world events in other worlds brings an epistemic ingredient into the interpretation of perfective *would*-conditionals. This is the 'indicative like' flavor noted by Lewis for *would*-conditionals about the future. In these examples, what we know about events in the world affects the proposition corresponding to the antecedent clause. For this reason, what we know about what is going on affects the interpretation of the conditional. But this doesn't mean that the interpretation of *would* itself is epistemically sensitive.

4.3.4 Conclusion

We started out in §4.1 by pointing out that simple past eventive *would*-conditionals seemed to behave like (epistemic) indicative conditionals, not like counterfactual conditionals. The interpretation of the modal in these cases seemed to be different than in other, clearly counterfactual, examples. But I have argued that this is not the case. We can account for variation in the interpretation by distinguishing between antecedent clauses that make reference to actual world events and antecedent clauses that

don't. Antecedent clauses that make reference to actual world events bring into play event matching relations that are sensitive to the actual world property of events.

4.4 The interpretation of perfect *would*-conditionals

We turn now to the question of why it is that perfect antecedent clauses behave differently from perfective antecedent clauses. After all, it is clearly true that your plants might have died next week:

(2) (continuation) Suppose that your plants die before you leave on holidays, and you cancel your request. I would feel sorry, but also relieved.

You: Don't worry about looking after my plants. They died yesterday.

Me: I am sorry, but also a bit relieved. If your plants had died next week (instead), I would have been very upset.

What is of interest to us is why a perfect in the antecedent clause allows us to access worlds in which there isn't an event matching the temporal parameter of the actual world death. The clue, I will argue, lies in the fact that perfects are like states, and do not make reference to events.

4.4.1 Perfects are stative

There are many questions to be asked about the interpretation of perfects. Some authors have been concerned with the temporal location of perfects, and the restrictions placed on modifiers (see McCoard (1978)'s "Extended Now" theory, see Pancheva & von Stechow (2004) for recent discussion of the 'present perfect puzzle'). There has also been interest in the evidential flavor of the perfect (see Izvorski (1997)), and other characterizations of a modal dimension (see Portner (2001)).

Here I will focus on one particular idea about the interpretation of the perfect: the idea that it introduces a 'result state'. Focusing on this aspect, I will set aside many important questions. I will not evaluate the extent to which a 'result state' theory of the

perfect can account for the various subtleties of the interpretation of the perfect (the reader is referred to Portner (2001) for a recent overview).

A 'resulting state' theory of the perfect is a theory that claims that the perfect introduces a state resulting from some event. Examples of this view are to be found in the work of Parsons and Kratzer, amongst others:

(48) **Perfects are stative** (Parsons (1994), Kratzer (1998))

- a. *For every event e that culminates, there is a corresponding state that holds forever after. This is "the state of e's having culminated", which I call the "Resultant state of e," or "e's R-state".* (Parsons 1994: 234)
- b. Where **P** is a property of events,
 $[[\mathbf{have}]](P) = \lambda t \lambda w \exists e [P(e)(w) \ \& \ t > \text{running-time}(e)]$ (Kratzer 1998)

Both Kratzer and Parson's proposals embody the idea that the perfect introduces the 'follow up' to an event. They differ in that Parson's proposal makes reference to states explicitly, while Kratzer's proposal is couched in terms of properties of times.

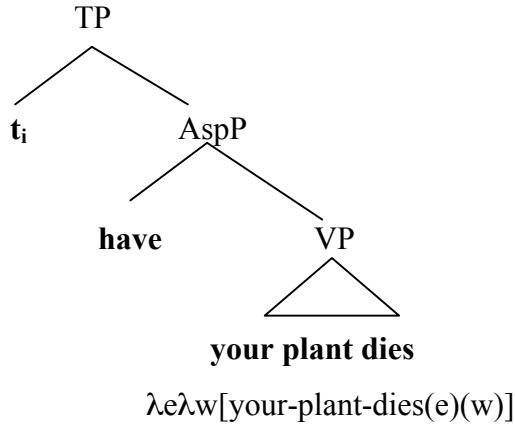
I will adopt Kratzer's implementation. It captures the intuition that perfects introduce 'resulting' states, states that arise as a consequence of an event having happened, and it fits well with the idea that states are properties of times.

Notice that in Kratzer's perfect, events are quantified over. There is no direct reference to events. As we will see in the next section, this translates into a non-deictic aspectual head.

4.4.2 Perfects in the antecedent clauses of conditionals

Let us return now to the interpretation of perfect conditionals. In the case of perfect antecedent clauses, the VP combines with tense via the perfect aspectual head. The denotation of the TP $[t_i \ [\text{perfect} \ [your \ plant \ dies]]]$ is given in (50):

(50) a.



$\lambda e \lambda w [\text{your-plant-dies}(e)(w)]$

b. $[[_{\text{TP}} t_i [_{\text{AspP}} \text{have} [_{\text{VP}} \text{your plant dies}]]] =$

$\lambda w \exists e [\text{your-plant-dies}(e)(w) \ \& \ t_i > \text{running-time}(e)]$

According to (50b), the TP in (50a) denotes the proposition that is true in a world if there is an event of your plants dying that has a running time that precedes t_i . The denotation of the corresponding *if*-clause would be: $\lambda t \lambda w \exists e [\text{your-plant-dies}(e)(w) \ \& \ t > \text{running-time}(e)]$.

What does all this tell us about the interpretation of conditionals?

(2) (continuation) Suppose that your plants die before you leave on holidays, and you cancel your request. I would feel sorry, but also relieved.

You: Don't worry about looking after my plants. They died yesterday.

Me: I am sorry, but also a bit relieved. If your plants had died next week (instead), I would have been very upset.

The quantificational domain of the modal in (2) is made up of worlds in which the actual world past precedes a time that follows an event of your plants dying next week. These are worlds in which the proposition corresponding to the antecedent clause is true:

(51) $\lambda w \exists e [\text{your-plants-dies}(e)(w) \ \& \ \text{next-week}(e)(w) \ \& \ t > \text{running-time}(e)]$,
where t is a non-past time.

This is the proposition that is true in a world if there is an event of your plants dying next week that takes place before some non-past time.

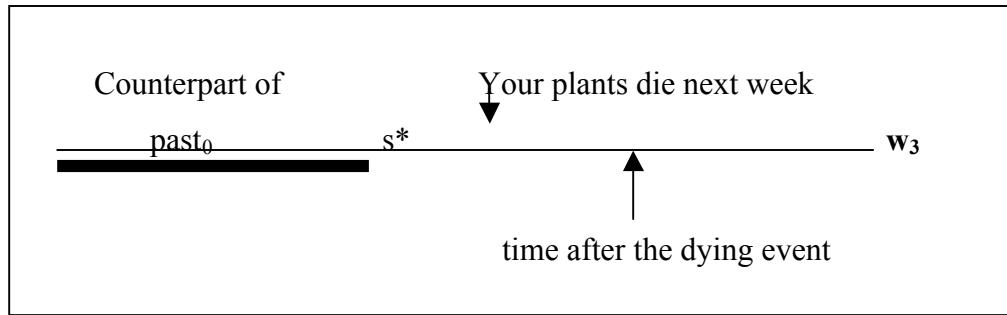
Let me say something about the temporal location of the dying event. When (51) functions as the antecedent of a *would*-conditional, the requirement will be that the past precede a time that follows a dying event. In general, this allows for the possibility that the dying event itself be past, present or future. The past will precede a time that follows the dying event in either way. In (51), the location of the dying event in the future is guaranteed by the temporal adverb *next week*. It places substantial restriction on the event time, and thus ensures the future interpretation.

It is interesting to note that it is very hard to obtain future interpretations of past perfect antecedent clauses without explicit future oriented adverbs. This could be due to the fact that we tend to interpret the ‘reference time’ of the perfect as a salient interval, and, unless otherwise indicated, take it to be the speech time.

A perfect in the antecedent clause does not really add much information about the temporal location of an event. Saying that the event has taken place before some non-past time does not really narrow down much the set of temporal options. So why is the presence of a perfect in the antecedent clause so important?

The crucial contribution of the perfect is to bind-off of the event variable. We see this in (51): the event variable is existentially closed and does not refer to any event. All that it takes for (51) to be true in a world is that there be some event of your plants dying next week that precedes the future time. This is the important contribution of the perfect. In the absence of reference to events, there is not need to figure out a matching relation for events. The temporal location of your plants dying in the actual world is irrelevant for the truth of (51). There need be no counterpart relation between the death of the plants in the worlds in which (51) is true and the death of the plants in the actual world.

The modal in (2) quantifies over worlds like w_3 :



Given the properties of the actual world, the past will precede a time at which your plants have died in the future only if the plants have not already died in the past. The worlds quantified over by the modal will be worlds in which the counterparts of the actual world past do not include an event of your plants dying. Antecedent clauses with a perfect can easily give rise to 'real counterfactual' interpretations.

4.4.3 Conclusion

The perfect head is not deictic. Perfect aspect existentially binds the event variable. This 'blocks off' the correspondence between events in the worlds in the quantificational domain of the modal and events in the actual world. Properties of the actual world death of the plants do not affect the proposition denoted by the antecedent clause. A perfect in the antecedent clause allows the modal to access worlds in which the plants have died at alternative times, facilitating a 'real counterfactual' interpretation.

Why is the quantificational domain of the modal made up of worlds in which the plants die in the future instead of in the past? The properties of the actual world past are such that it would not plausibly precede a future event of the plants dying if it already included an event of the plants dying. The world would have to be very different in order for it to be possible for plants to die twice. The counterparts of the actual world past in worlds in which the antecedent clause in (2) is true differ from the actual world past in that they do not include an event of the plants dying.

4.5 Evidence from modifiers: the effects of aspect in temporal adjunct clauses and relative clauses

Let me present additional evidence in favor of the distinction between perfect and perfective clauses by investigating the behavior of clausal modifiers in antecedent clauses. We will consider two types of modifiers: tensed temporal adjunct clauses and tensed relative clauses. These examples are interesting to us because the same logic that we applied to main clauses in §4.3 and §4.4 will apply to subordinate clauses too. If the modifier contains a simple past eventive verb, the event will be identified in other worlds via strict counterpart relations, and the properties of actual-world events will become relevant.

We'll begin with data from tensed temporal adjunct clauses.⁴⁵

(52) a. #George didn't read the book review in The New York Times. If he had bought the book after he read that review, he would have been incredibly silly.

b. George didn't read the book review in The New York Times. If he had bought the book after reading that review, he would have been incredibly silly.

(53) a. #George thinks well of the police superintendent because he never got a fine. If he had dealt with the superintendent after he got a fine, he would have a very different opinion.

b. George thinks well of the police superintendent because he never got a fine. If he had dealt with the superintendent after getting a fine, he would have a very different opinion.

⁴⁵ I am comparing the simple past case with a non-tensed gerundive form. This is because it is independently awkward to have a perfect *have* in both clauses:

(i) ?George had dealt with the superintendent after he had filed a complaint.
On the other hand, two simple past clauses (ii), or a simple past clause plus a gerundive clause (iii), are perfectly fine:

(ii) George dealt with the superintendent after he filed a complaint.
(iii) George dealt with the superintendent after filing a complaint.

As we see in (52) and (53), *after*-clauses in the antecedent are slightly worse when they contain simple past tense morphology and we know that there is no event with the appropriate properties in the actual world. They are better if we know that there is a suitable event in the actual world. Consider the following variant of (52):

(54) George decided not to buy the book after he read the review in The New York Times. If he had bought the book after he read that review, he would have been incredibly silly.

A similar pattern is found with *when*-clauses. Compare (55a) and (55b):

(55) a. #It's a good thing that Sara did not come to the party. If George had snorted when she came in, she would have been offended.
b. It's a good thing that Sara did not come to the party. If George had snorted when/while she was coming in, she would have been offended.

Arguably, the past progressive morphology in (55b) is not perfective, and does not refer to events, nor set up strict counterpart relations with events in other worlds. This morphology is more acceptable than simple past perfective morphology if we know that no event with the appropriate properties is found in the actual world. But again, if some actual world event can serve as counterpart to the event mentioned by the adjunct clause, a perfective, simple past is quite acceptable:

(56) It's a pity that Sara sneezed during the speech, but at least George took no notice. If he had laughed when she sneezed, it would have been very embarrassing.

In this example there is an actual world event of Sara sneezing in the past that stands in a strict counterpart relation to a past event of Sara sneezing in the worlds quantified over by the modal. The perfective simple past temporal adjunct is quite all right.

It is interesting to note that when a *when*-clause receives a ‘while’ interpretation, a simple past can be acceptable:

(57) Thank God George did not come down the stairs. If he had slipped when he came down, he would have sued us.

It is plausible that in this interpretation the aspectual head is not perfective. However, the matter remains for future research.

Evidence coming from relative clauses also supports the generalization above. A relative clause with a simple eventive verb is infelicitous if the event it describes does not match the temporal parameter of an actual world event. In such cases, a relative clause with a perfect is preferred. This is illustrated in (58) and (59):

(58) a. #Unfortunately, Professor Smith died before finding a cure for insomnia.

But if the cure the professor discovered had been very expensive, the insurance companies would not have made it available to the general public anyway.

b. Unfortunately, Professor Smith died before finding a cure for insomnia.

But if the cure the professor had discovered had been very expensive, the insurance companies would not have made it available to the general public anyway.

(59) a. #The witness did not actually see the robber. But if the man the witness saw had been African American, the press would have commented upon it.

b. The witness did not actually see the robber. But if the man the witness had seen had been African American, the press would have commented upon it.

The infelicity of the simple past cases is not due to some inherent problem with having a simple past relative clause. The examples are perfectly acceptable if the event described

by the relative clause matches with some actual world event. This is illustrated for the cases in (58) and (59) by (60a) and (60b) respectively:

(60) a. It is lucky that the cure for insomnia that Professor Smith discovered is so cheap. If the cure the professor discovered had been very expensive, the insurance companies would not have made it available to the general public.

b. It is fortunate that the witness did not see an African American man. If the man the witness saw had been African American, the press would have commented upon it.

As predicted by the story so far, simple eventive verbs contrast with simple stative verbs in relative clauses. This is illustrated by (61):

(61) a. Unfortunately, there isn't a single philosopher that my wife admires. But if a philosopher that my wife admired had visited the department last semester, I would have invited him to our house.

b. #As far as I know, my wife has never insulted any philosopher. However, if a philosopher that my wife insulted had visited the department last semester, I would still have invited him to our house.

It is worth pointing out that the problem with examples like (61b) cannot be attributed to the temporal order of events in the antecedent clause. It would be a mistake to think that the problem arises because of a mismatch between tense morphology and the relative order between the events.

(62) #My wife, recently departed, never insulted any philosopher. But if a philosopher that my wife insulted visited the department, I would still invite him to our house.

(63) During the course of her career, my wife has insulted many philosophers. But if a philosopher that my wife insulted visited the department, I would still invite him to our house.

The contrast between (62) and (63) shows that there is nothing inherently wrong with having simple past tense morphology in both the relative clause and the antecedent main clause. The acceptability depends on what counts as common knowledge in the context of utterance.

4.6 Additional data

There is additional data that, obliquely, supports the hypothesis that different types of aspect may or may not ‘anchor’ events to the actual world. It comes from the perfective/imperfective distinction in Romance. Here I will provide examples from Italian and Spanish.

Bonomi 1997 (a.o.) notes that there is a difference in the interpretation of sentences with *when*-clauses depending on whether aspect is perfective or imperfective. Examples are provided in (64) and (65):⁴⁶

(64) Quando mi vedeva, il custode apriva la porta.

When me saw-Imp, the janitor opened-Imp the door.

Whenever the janitor saw me, he opened the door

(65) Quando mi vide, il custode aprì la porta.

⁴⁶ Bonomi 1997 also provides examples from French [Proust, *Guermantes*, quoted in Bonomi 1997: 474]

(i) Quand le moment de son passage me semblait proche, je remontait d'un air distrait

Whenever the moment of her appearance seemed near, I went up with an air of indifference.

(ii) Quand il tourna la tête, je vis que je m'étais trompé.

(In a particular circumstance) when he turned his head, I realized my mistake.

When me saw-Perf, the janitor opened-Perf the door
(*In a particular circumstance*) when the janitor saw me, he opened the door
(Bonomi 1997: 474)

Examples with imperfective aspect (64) have a ‘whenever’ interpretation, whereas examples with perfective aspect (65) have a ‘one time only’ interpretation.

Bonomi’s account of the contrast between (64) and (65) relies on the idea that there are different kinds of implicit adverbial quantifiers at work. However, as he himself notes, this proposal is challenged by the fact that imperfective and perfective cases do have different interpretations even in the presence of an overt adverbial quantifiers.

This point is taken up by Menéndez-Benito (2002), who discusses the facts for the case of Spanish, that behaves like Italian.⁴⁷ Menéndez-Benito points out that there is a difference between (66) and (67) below:

(66) Siempre que vino a mi casa, Juan fumó.
Always that came-Perf to my house, Juan smoked-Perf
When Juan came to my place, he always smoked

(67) Siempre que venía a mi casa, Juan fumaba
Always that came-Imp to my house, Juan smoked-Imp
When Juan came to my place, he always smoked (Menéndez-Benito 2002: 366)

In spite of the identical gloss, there is a clear difference in the meaning of (66) and (67). There is something ‘accidental’ about the circumstances needed to make (66) true, while this is not the case for (67). Menéndez-Benito argues that perfective examples [like (66)] express an accidental generalization, whereas imperfective examples [like (67)] express a non-accidental generalization. Menéndez-Benito adopts Goodman’s (1947) characterization of non-accidental generalizations as law-like statements, while accidental generalizations are contingent descriptions.

⁴⁷ For the Italian facts, see Lenci (2000).

The difference between law-like statements and contingent descriptions is of interest to us here because law-like statements are arguably modal, and have truth conditions that make reference to non-actual worlds, whereas the truth of a contingent description depends exclusively on what happens here, in the actual world. The fact that we do not obtain a law-like statement when perfective aspect is used suggests that the cases with perfective aspect are tied to contingent events in the actual world, whereas this is not the case for imperfective aspect.

BIBLIOGRAPHY

Adams, Ernest: 1970, 'Subjunctive and indicative conditionals', Foundations of Language **6**, 89-94.

Anderson, Alan. R.: 1951, 'A Note on Subjunctive and Counterfactual Conditionals', Analysis **12**, 35–38.

Arregui, Ana: 2000, 'The interpretation of *always*', ms. University of Massachusetts, Amherst.

Beaver, David: 1995, Presupposition and assertion in dynamic semantics, PhD dissertation, University of Edinburgh.

Bennett, Jonathan, 1984: 'Counterfactuals and temporal direction', The Philosophical Review **93**, 7-89.

Bennett, Jonathan, 1995: 'Classifying conditionals: the traditional way is right', Mind **104**, 331-354.

Bennett, Jonathan and Barbara Partee: 1978, Towards the logic of tense and aspect in English, Indiana University Linguistics Club, Indiana.

Bhatt, Rajesh and Roumyana Pancheva: 2001, 'Conditionals', ms. University of Texas, Austin and USC.

Bonomi, Andrea: 1997, 'Aspect, Quantification, and When-clauses in Italian', Linguistics and Philosophy **20**, 469-514.

Chierchia, Gennaro: 2000, Dynamics of Meaning, University of Chicago Press, Chicago.

Chisholm, Roderick M.: 1946, 'The contrary to fact conditional', Mind **55**, 289-307.

Condoravdi, Cleo: 2001, 'Temporal interpretation of modals', in David Beaver, Stefan Kaufman, Brady Clark and Casillas (eds) Stanford Papers in Semantic SLI Publications, Palo Alto.

Dowty, David: 1977, 'Towards a Semantic Analysis of Verb Aspect and the

English ‘Imperfective’ Progressive’, *Linguistics and Philosophy* 1, 45–77.

Dowty, David: 1979, *Word meaning in Montague Grammar*, Reidel, Dordrecht.

Dretske, Fred: 1972, ‘Contrastive Statements’, *The Philosophical Review* 81, 411–437.

Dudman, Victor. H.: 1983, ‘Tense and Time in English Verb Clusters of the Primary Pattern’, *Australian Journal of Linguistics* 3, 25–44.

Dudman, Victor. H.: 1984, ‘Conditional Interpretations of *If*-sentences’, *Australian Journal of Linguistics* 4, 143–204.

Edginton, Dorothy: 1995, ‘On Conditionals’, *Mind* 104, 235–329.

Enç, Mürvet: 1986, ‘Towards a Referential Analysis of Temporal Expressions’, *Linguistics and Philosophy* 9, 405–426.

Enç, Mürvet: 1996, ‘Tense and Modality’, in Shalom Lappin (ed.), *The Handbook of Contemporary Semantic Theory*, Blackwell Publishers, London. 345–358.

Fine, Kit: 1975, ‘Review of Lewis 1973’, *Mind* 84, 451–458.

Fintel, Kai von: 1994, *Restrictions on quantifier domains*, unpublished PhD dissertation, University of Massachusetts, Amherst.

Fintel, Kai von: 1995, ‘A minimalist theory of adverbial quantification’, ms. MIT

Fintel, Kai von: 1998, ‘The Presupposition of Subjunctive Conditionals’, in U. Sauerland and O. Percus (eds.), *The Interpretive Tract*, MITWPL 25, MIT, Cambridge, 29–44.

Fintel, Kai von: 2001, ‘Counterfactuals in a Dynamic Context’, in Kenstowicz, Michael (ed.), *Ken Hale: A Life in Language*, MIT Press, Cambridge, 132–152.

Fowler, Henry W.: 1965, *Fowler's Modern English Usage*, Oxford University Press, Oxford.

Goodman, Nelson: 1947, ‘The problem of counterfactual conditionals’, *The Journal of Philosophy* 44, 113–118.

Grice, Herbert P.: 1975, ‘Logic and Conversation’, in P. Cole and J. Morgan (eds.), *Syntax and Semantics 3: Speech Acts*, Academic Press, New York, 41–58.

Heim, Irene: 1982, *The Semantics of Definite and Indefinite Noun Phrases*. PhD dissertation, University of Massachusetts, Amherst.

Heim, Irene: 1992, ‘Presupposition projection and the semantics of attitude verbs’, *Journal of Semantics* 9, 183–221.

Heim, Irene: 1994, 'Comments on Abusch's Theory of Tense', in H. Kamp (ed.), Ellipsis, Tense and Questions, University of Amsterdam, 141–170.

Heim, Irene and Angelika Kratzer: 1998, Semantics in Generative Grammar, Blackwell, Cambridge, Massachusetts/

Higginbotham, James: 1983, 'The Logic of Perceptual Reports: An Extensional Alternative to Situation Semantics'. Journal of Philosophy **80**, 100-127.

Huddleston, Rodney and Geoffrey Pullum (eds.): 2002, The Cambridge grammar of the English language, Cambridge university press, Cambridge.

Iatridou, Sabine: 2000, 'The Grammatical Ingredients of Counterfactuality', Linguistic Inquiry **31**, 231–270.

Ippolito, Michela: 2003, 'Presuppositions and Implicatures in Counterfactuals', Natural Language Semantics **11**, 145-186.

Izvorski, Roumyana: 1997, 'The present perfect as an epistemic modal', in Aaron Lawson (ed.), Proceedings of SALT VII, CLC Publications, Cornell University.

Kamp, Hans and Uwe Reyle: 1995, From discourse to logic, Kluwer Academic Publishers, Dordrecht.

Katz, Graham: 1995, Stativity, Genericity, and Temporal Reference, unpublished PhD dissertation, University of Rochester, New York.

Klein, Wolfgang: 1994, Time in Language, Routledge, London.

Kratzer, Angelika: 1977, 'What *must* and *can* must and can mean', Linguistics and Philosophy **1**, 337-355.

Kratzer, A.: 1981, 'The Notional Category of Modality', in Hans-Jürgen Ekmeyer and Hannes Rieser (eds.), Words, Worlds, and Contexts, De Gruyter, Berlin, 38–74.

Kratzer, A.: 1986, 'Conditionals', in Anne M. Farley, P. Farley, and K.-E. McCullough (eds.), CLS 22: Papers from the Parasession on Pragmatics and Grammatical Theory, Chicago Linguistic Society, Chicago. 1–15.

Kratzer, Angelika: 1989, 'An investigations of the lumps of thought', Linguistics and Philosophy **12**, 607-653.

Kratzer, A.: 1991, 'Modality', in Arnim von Stechow and Dieter Wunderlich (eds.), An International Handbook of Contemporary Research, De Gruyter, Berlin, 639–650.

Kratzer, A.: 1998, 'More Structural Analogies Between Pronouns and Tenses', in Devon

Strolovitch and Aaron Lawson (eds.), Proceedings of Salt VIII. CLC Publications, Cornell University, Ithaca, N.Y.

Kratzer, Angelika: 2001, 'The event arguments and the semantics of verbs', ms. University of Massachusetts, Amherst.

Kusumoto, Kiyomi: 1998, Tense in embedded contexts, unpublished PhD dissertation, University of Massachusetts, Amherst.

Lenci, Alessandro and Pier Marco Bertinetto: 2000, 'Aspect, Adverbs, and Events: Habituality vs. Perfectivity', in James Higginbotham, Fabio Pianesi and Achille C. Varzi (eds.), Speaking of Events, Oxford University Press, Oxford/ New York, 245-287.

Lewis, David: 1971, 'Counterparts of Persons and their Bodies', Journal of Philosophy **68**, 203-211.

Lewis, D.: 1973, *Counterfactuals*. Harvard University Press, Cambridge, Mass.

Lewis, David: 1975, 'Adverbs of Quantification', in Edward L. Keenan (ed.), Formal Semantics of Natural Language, Cambridge University Press, Cambridge, 3-15.

Lewis, D.: 1979, 'Counterfactual Dependence and Time's Arrow', Noûs **13**, 455-476. Reprinted in D. Lewis (1986), *Philosophical Papers*, Vol. 2, Oxford University Press, Oxford.

Lewis, D.: 1986, *On the Plurality of Worlds*. Basil Blackwell, Oxford.

McArthur, Tom (ed.): 1992, The Oxford Companion to the English Language, Oxford University Press, Oxford.

McCoard, Robert, 1978, The English Perfect: Tense Choice and Pragmatic Inferences, North Holland Publishing Company, Amsterdam.

Menéndez-Benito, Paula: 2002, 'Aspect and Adverbial Quantification in Spanish', in Mako Hirotani (ed.), Proceedings of NELS 32, GLSA Publications, Amherst, 365-382.

Musan, Renate: 1997, On the Temporal Interpretation of Noun Phrases (Outstanding Dissertations in Linguistics). Garland, New York.

Newton, Brian: 1979, 'Scenarios, modality, and verbal aspect in Modern Greek', Language **55**, 139-167,

Ogihara, Toshiyuki: 1996, Tense, Attitudes, and Scope, Kluwer Academic Publishers

Ogihara, Toshiyuki: 2000, 'Counterfactuals, Temporal Adverbs, and Association with

Focus', in Proceedings of SALT 10, CLS Publications, Cornell University, Ithaca, N.Y. 115–131.

Palmer, Frank R.: 1986, Mood and Modality, Cambridge University Press, Cambridge.

Palmer, Frank R.: 2001, Mood and Modality, second ed. Cambridge University Press, Cambridge.

Parsons, Terence: 1990, Events in the semantics of English, MIT Press, Cambridge.

Pancheva, Roumyana and Armin von Stechow: 2004. 'On the Present Perfect Puzzle', To appear in K. Moulton and M. Wolf (eds.) NELS 34, GLSA Publications, Amherst, MA.

Parsons, Terence: 1994, Events in the semantics of English: a study in subatomic semantics, MIT Press, Cambridge.

Partee, Barbara: 1973, 'Some Structural Analogies between Tense and Pronouns', The Journal of Philosophy 70, 601–609.

Portner, Paul: 1992, Situation Theory and the semantics of propositional expressions, unpublished PhD dissertation, University of Massachusetts, Amherst.

Portner, Paul: 2001, 'The temporal semantics and modal pragmatics of the perfect', ms. University of Georgetown.

Quirk, Randolph, et al.: 1985, A Comprehensive Grammar of the English Language, Longman, New York.

Rooth, Mats: 1985, Association with Focus, unpublished PhD dissertation, University of Massachusetts at Amherst.

Rooth, Mats: 1992, 'A Theory of Focus Interpretation', Natural Language Semantics 1, 75–116.

Schwarzschild, Roger: 1999, 'GIVENness, AvoidF and Other Constraints on the Placement of Accent', Natural Language Semantics 7, 141–177.

Slote, Michael: 1978, 'Time in Counterfactuals', Philosophical Review 7, 3–27.

Smith, Carlota: 1991, The Parameter of Aspect, Kluwer Academic Publishers, Dordrecht.

Stalnaker, Robert: 1968, 'A Theory of Conditionals', in Nicholas Rescher (ed.), Studies in Logical Theory 2, Blackwell, Oxford, 98–122.

Stalnaker, Robert: 1973, 'Presuppositions', Journal of Philosophical Logic 2, 447–457.

Stalnaker, Robert: 1975, 'Indicative Conditionals', Philosophia 5, pp. 269–286.

Stalnaker, Robert: 1981, 'A Defense of the Conditional Excluded Middle', in Robert Stalnaker, William Haper and Glenn Pearce (eds.), Ifs: Conditionals, Belief, Decision, Chance, and Time, Reidel, Dordrecht, 87-104..

Stalnaker, Robert: 1984, *Inquiry*. MIT Press, Cambridge, Mass.

Stalnaker, Robert: 1999, *Context and Content*, Oxford University Press, Oxford.

Stowell, Tim: 1982, 'The Tense of Infinitives', Linguistic Inquiry 13, 561–570.

Stowell, Tim: 1995, 'The Phrase Structure of Tense' in Johan Rooryck and Lori Zaring, (eds.), Phrase Structure and the Lexicon, Dordrecht, Kluwer.

Stowell, Tim: 2004, 'Tense and Modals' in Jacqueline Guéron and Julie Lecarme, (eds.) The Syntax of Time, MIT Press, Cambridge.