When aspect matters: the case of *would*-conditionals[1]

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1. Introduction

Conditionals of the form *if a, would b* (*would*-conditionals) pose many challenges. In this paper I address the problem of explaining the difference between examples with simple morphology in the antecedent, such as *if your plants died next week, I would be upset* vs. examples with perfect morphology in the antecedent, such as *if your plants had died next week, I would have been very upset*. The goal is to provide a unified Lewis-Stalnaker analysis of *would* and still explain the differences in interpretation.

Examples like these have recently been the subject of work by Ogihara and Ippolito (Ogihara (2000), Ippolito (2003)), and I will discuss their proposals in (§4). In (§2), I will discuss the Lewis-Stalnaker semantics and explain the problems posed by aspect. My proposal will be presented in (§3).

2. On the project of a unified accounts

It is good to be cautious about a unified Lewis-Stalnaker analysis for *would*. Lewis, for example, didn't think it would work. Here I'll present the basic idea behind such a view, and explain the problems. My goal is to shape the intuitions behind my proposal in §3.

2.1 Preliminaries: the Lewis-Stalnaker conditional

Lewis and Stalnaker have both proposed semantics for conditionals based on similarity (a.o. Lewis 1973, 1979, Stalnaker 1968). The proposals claim, roughly, that a conditional of the form *if A, B* is true in a world *w* iff the most similar worlds to *w* in which *A* is true are also worlds in which *B* is true (making some simplifications, adopting the Limit Assumption and allowing for ties). Lewis's and Stalnaker's proposals take the form of logics for conditionals, and in the schema above, both *A* and *B* stand for propositions. There is some work to be done in understanding how the proposed logics elucidate the interpretation of natural language constructions.

Let us call natural language conditionals that have a semantics fitting the proposals made by Lewis and Stalnaker *Lewis-Stalnaker conditionals (LS-conditionals*). Which natural language conditionals are LS-conditionals? Lewis and Stalnaker gave different answers to this question, with Lewis taking the more restrictive view. Lewis considered that only counterfactuals were LS-

[1] I would like to thank Phil Bricker, Barbara Partee and especially Angelika Kratzer for their thoughtful comments on earlier stages of this work. I would also like to thank audiences of the Linguistics Colloquium at University of British Columbia and WCCFL at the University of Washington, in particular Lisa Matthewson and Toshiyuki Ogihara, for helpful discussions. Finally, two anonymous reviewers gave me detailed feedback, which is gratefully acknowledged. All remaining mistakes are my own.

conditionals. There wasn't, however, a morphological characterization of this class. Granted, counterfactuals often had special morphology (which he called 'subjunctive'), but it wasn't distinctive (nor necessary). There were some subjunctive conditionals that were not counterfactual, and the ones pertaining to the future stood out:

(1) "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)

My investigations in this paper can be said to centre on the range of the LS-analysis. In spite of Lewis's concerns, I think it is possible to maintain a unified LS-analysis of *would* both in classical counterfactual examples *(if our troops had entered Laos next year, there would have been trouble)* and in subjunctive conditionals pertaining to the future like the one mentioned by Lewis (*if our troops entered Laos next year, there would be trouble)*. The term 'unified analysis' will refer to this possibility (though a full unified analysis of *would* clearly requires more).[2]

I'll begin by discussing some examples in more detail, to better understand the problems facing a unified analysis. Consider (2)

(2) Suppose you are about to go on holidays, and ask me to look after your plants. I accept, but I am rather nervous. I am not very good with plants.

You: Could you look after my plants next week, while I am gone?
Me: Of course. But I am rather nervous. If your plants died next week, I would be very upset.

(2) is like Lewis's Laos-example: a simple tense eventive antecedent clause is used to make a hypothesis pertaining to the future. But this is not the only way to speculate about future events. Consider (3):

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

[2] From now on, I will use terminology in the following way: I'll call natural language conditionals with a semantics fitting the similarity-based conditionals in the logics proposed by Lewis and Stalnaker *LS-conditionals* (a *semantic* characterization), and I'll call conditionals with antecedents that are known to be false in the context of utterance *counterfactual conditionals* (a *pragmatic* characterization).

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 example, a perfect antecedent clause is used to make a hypothesis about the future. It would be very strange to utter the conditional in (2) in the context of (3):

(4) You: Don't worry about looking after my plants. They died yesterday.
Me: #I am sorry, but also a bit relieved. If your plants died next week (instead), I would be very upset.

However, we shouldn't conclude from this contrast that a perfect antecedent is needed in counterfactual conditionals. Consider what happens with states:

(5) Suppose you keep your plants in the kitchen cupboard, and worry 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 doing much better.

Simple stative clauses pattern with perfect clauses in being able to function as the antecedents of counterfactual conditionals. Simple eventive clauses give rise to the 'indicative' effects mentioned by Lewis.[3]

Lewis understood the contrast between (2) and (3) as evidence that these were not both LS-conditionals. His assumption seems to have been that the antecedent clause proposition is the same in both cases (the proposition *that your plants die next week*), and the reasonable conclusion was that the conditional 'connective' must be different. But the assumption is disputable, and I will argue that the different shapes of the antecedents make available different antecedent propositions. This matters. The antecedent proposition is crucial in determining the quantificational domain of the modal: with different propositions, the domains of quantification can vary, and the interpretations of the conditionals can too.

[3] In the paper I focus on the problem of explaining the domain of quantification of the modal on the basis of the antecedent, and I will not discuss the consequent clause. However, in terms of felicity, the patterns in the consequent appear to be similar to those of the antecedent, and fitting the proposal I will make here:

(i) My plants died yesterday. #If you had looked after them better, they would die much later.
(ii) My plants died yesterday. If you had looked after them better, they would have died much later.
(iii) My plants died yesterday. If you had looked after them better, they would (still) be alive.

2.2 On the problem of presupposed counterfactuality

Before taking a closer look at the data and general strategy, we'll take a small pre-emptive detour. There is another kind of reason why a unified analysis of *would* could appear, at first glance, far away. Since Anderson (1951), it has often been noted that subjunctive conditionals do not actually presuppose or entail the falsity of their antecedent clause. Here is Anderson's original example:

(6) "In the investigation of Jones' death, a doctor might say "If Jones had taken arsenic, he would have shown just exactly those symptoms which he does in fact show". Now in this context the doctor's statement would probably be taken as lending support to the view that Jones took arsenic – it would certainly not be held to imply that Jones did not take arsenic."
(Anderson 1951)

In this kind of example we reason 'as detectives': we work our way backwards from the known consequence (in the consequent), to the cause (in the antecedent). The consequent is taken as evidence for the antecedent.

Anderson-examples have often lead to the conclusion that the 'counterfactuality' of the antecedent in *would*-conditionals is an implicature (it can be cancelled). Ippolito (2003) points to cases of *would*-conditionals with perfect antecedents set in the future in which it does not seem to be possible to cancel counterfactuality. This suggests that the cases are somehow special, and different from standard *would*-conditionals.[4] If true, they would also be crucially different from examples like (2) (in which we actually seem to be taking for granted that the antecedent is possible). A unified analysis would become trickier.

I will discuss Ippolito (2003) in some detail in §4.3. Here I will examine the general reasoning behind Ippolito's counterfactuality discussion, to hopefully set this concern aside. Ippolito make the important observation that we cannot construct Anderson-type examples with perfect antecedents set in the future. When we try, things go wrong:

(7) # If Charlie had gone to Boston by train tomorrow, Lucy would have found in his pocket the ticket that she in fact found. So he must be going to Boston tomorrow.
(Ippolito 2003)

[4] I will discuss the idea that counterfactuality cannot be cancelled, but this is not Ippolito's final conclusion, who considers that these conditionals are special in that counterfactuality can be harder to cancel (see Ippolito 2003, p. 177 for an example where counterfactuality appears to be cancelled). Some authors have argued that counterfactuality in these examples is 'stronger' than in standard *would*-examples (a.o. Dudman (1984), Ogihara (2004, 2006)). The proposal in this paper is compatible with an implicature analysis of counterfactuality.

The oddness of (7) suggests that perfect *would*-conditionals pertaining to the future are particularly resistant to cancelling counterfactuality. But before reaching this conclusion, Ippolito is careful to first examine and dismiss the possibility that (7) goes wrong simply because it is a *backtracking conditional* (i.e. a conditional in which 'the time of the consequent precedes the time of the antecedent'). If backtracking itself were disallowed, (7) would be bad for reasons that have nothing to do with the counterfactuality implicature.

Backtracking conditionals are difficult, but they are not impossible (there are many views on backtracking, see Bennett (1984; 2003 for an overview). Lewis (1979) presented us with the following example (also mentioned by Ippolito), showing that contextual support often helps (I have highlighted the conditional):

(8) "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."
(Lewis 1979:456)

As (8) shows, with the right contextual support and auxiliaries, we are able to reason backwards in time and accept conditionals in which the time of the consequent precedes the time of the antecedent.

Ippolito points out that it is possible to construct reasonable backtrackers with perfect antecedent clauses set in the future, and offers us (9):

(9) If Charlie had gotten married to Sally tomorrow, he would have had his bachelor party tonight
(*meaning that Charlie will not get married tomorrow and he will not have his bachelor party tonight*) (Ippolito 2003:148)

Since (9) shows that backtracking is possible, Ippolito concludes that the problem with (7) really is about cancelling the implicature.

The idea that counterfactuality cannot be cancelled is worrying for a unified analysis. But I don't think this need be the conclusion. As Ippolito noted, in order to construct Anderson-examples with perfect *would*-conditionals pertaining to the future we need to have backtracking conditionals. But it seems Anderson-examples *in general* do not backtrack well. Descriptively, there seems to be an incompatibility between backtracking and the kind of detective reasoning we see in the Anderson cases. And this has nothing to do with whether the perfect antecedent is set in the future or not. Consider the variations in (10) and (11):

(10) ?If Jones had bought arsenic yesterday, he would have started with this furtive behaviour last week, as he actually did. So he must have bought arsenic yesterday.

(11) ?If Jones had swallowed arsenic, his wife would have given it to him in exactly the way she did. So he must have swallowed arsenic.

These examples don't go through as smoothly as (6). Even if we push pragmatics, as in (11), there is still a feeling that the sequence is odd. We resist the conclusion, and cannot shake the idea that maybe Jones didn't actually swallow the stuff.[5]

It seems to me that backtrackers don't work as Anderson examples because the kind of reasoning we usually put in motion for backtracking does not access the same (standard) intuitions about causation that are crucial to our detective-reasoning reconstruction in the Anderson-examples. Lewis (1979) has argued that backtracking examples are special and do not really invoke causation (this is subject of much debate in the philosophical literature, which I won't go into). In Arregui (2005) I have argued that in (smooth) backtracking *would*-conditionals there is usually a non-standard link between antecedent and consequent, presenting an analysis in which there is an extra layer of modality. Extra modality is often made explicit by a special set of auxiliaries, which can make backtracking more acceptable. We see them in Lewis's illustration and in the examples corresponding to (12) and (13), given below:

(12) If Jones had bought arsenic yesterday, he would <u>have to have started</u> with this furtive behaviour last week.
(13) If Jones had swallowed arsenic, his wife would <u>have to have given</u> it to him.

From the modalized consequents in (12) and (13), we do not reason back to the antecedent as we do in the Anderson-examples. Whereas we do seem to be willing to go from *He is showing the symptoms of arsenic poisoning* to *He must have taken arsenic*, we are not willing to go from *His wife has to have given him arsenic* to *He must have swallowed arsenic*. If anything, the modalized consequent fits better with the negation of the antecedent:

(14) If Jones had swallowed arsenic, his wife would have to have given it to him. But she didn't, so he probably didn't swallow it.

The kind of modality invoked by the consequent in backtracking examples does not seem to provide us with the same epistemic certainty as the intuitions about

[5] Moving away from arsenic can give us sharper intuitions. Note that (i) and (ii) are still not quite Anderson backtrackers:
(i) ?If they had had a baby together, they would have had sex (as they actually did).
(ii) ?If they had eaten their own home-made bread, they would have baked a loaf (as they actually did).

causation invoked in the standard forward-looking cases. If anything, a modalized consequent appears to weaken our epistemic certainty.

If it is true that the kind of link between antecedent and consequent needed to make backtracking work is different from the kind of link needed for the detective reasoning in the Anderson-examples, the fact that (7) cannot receive an Anderson-style interpretation does not say anything special about counterfactuality.

2.3 Data and strategy

We turn back now to our main concern, the project of unifying LS-*would* in (2)/(4), (3) and (5). Examples like (3) are not actually problematic, and seem to behave as expected from the LS-perspective:

(3) Suppose your plants die before you leave on holidays, and you cancel your request. I 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.

There is no problem with saying that the antecedent worlds in (3) are the most similar worlds in which your plants die next week. Reasonably, these are worlds in which your plants die only once (that is how death actually works). Worlds in which your plants die only once and next week are worlds that differ from the actual world in that your plants did not die yesterday. The similarity-based LS-semantics for *would* correctly predicts that the modal has access to worlds that differ from the actual world with respect to the death of the plants.

The stative examples are also well-behaved:

(5) You: I am worried about my plants.
Me: Oh, they simply do not have enough light. If they had enough light, they would be doing much better.

As predicted by the LS-analysis, the modal in (5) has access to worlds that differ from the actual world with respect to the plants' light situation.

The problematic examples are the ones like (4).[6]

(4) You: Don't worry about looking after my plants. They died yesterday.
Me: #I am sorry, but also a bit relieved. If your plants died next week (instead), I would be very upset.

Descriptively, (4) does not seem to quantify over the most similar worlds in which your plants die next week instead of yesterday. We find (4) infelicitous. At best, (4) is interpreted as making a hypothesis about worlds in which your

[6] I will first be concerned with explaining what goes wrong in (4), and then (§3.5), explaining what goes right in (2).

plants die next week as well as yesterday. Arguably, these are not the most similar worlds in which your plants die next week. Considerations of similarity appear to be systematically over-ridden by something else. One way to describe the problem is to say that the modal is forced to quantify over worlds that are like the actual world with respect to the death of the plants. Even though the similarity-based semantics of the modal would plausibly lead us to set aside worlds in which the plants die twice, the modal only has access to worlds in which the plants die when they actually do (*yesterday*) as well as when the antecedent clause claims they do (*next week*). Moreover, lurking in the background is the suspicion that the speaker seems to be assuming that the actual world could be in that set (this intuition seems to be decisive in making (4) infelicitous). This description of what is going on suggests that claims made with simple eventives in some sense project beyond the antecedent. A preliminary way to capture this intuition would be to talk of 'scope'. It is as if, with simple eventive verbs, claims made about events take 'wide scope' with respect to the antecedent, and are (in a way that is not yet clear) understood as being claims about events in the actual world.

Given the contrast between (4) and (3)/(5), the presumed link to the actual world seems to depend on verbal morphology. Perfect and stative morphology do not result in antecedent hypothesis with 'anchoring' to the actual world, as described here. It is simple eventive morphology that has this effect. The interpretation of adjunct-clauses supports the idea that it is the actual occurrence of verbal morphology that matters. Even if the main verb in an antecedent clause has canonical 'counterfactual morphology', simple eventives in modifiers can still trigger 'wide scope' effects (arguing against a possible view according to which a main-clause perfect makes available a counterfactual interpretation for the entire clause). I present a series of examples, beginning with *after*-clauses.

As (15) shows, simple eventive morphology in the *after*-clause is not acceptable when a 'wide scope' interpretation is infelicitous:

(15) 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 very 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 very silly.

Given a suitable actual-world event, however, the conditional is fine:

(16) 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 very silly.

The contrast in what we are calling 'actual world anchoring' can also be found with relative clauses:

(17) 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.

Again we see that a suitable event in the actual world makes the conditional fine:

(18) 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.

Finally, the contrast we observed in (4) and (5) between events and states also shows up in relative clauses:

(19) 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. But if a philosopher that my wife insulted had visited the department last semester, I would still have invited him to our house.

As we see in (19a), no 'wide scope' effect arises with a stative relative clause. However, it does with an eventive one (19b).

Though I have been informally talking about 'wide scope', the effects above do not arise literally as a matter of scope. This would give the wrong interpretation, as well as being problematic from an operational perspective. Antecedent clauses of conditionals are islands for extraction so we cannot simply talk about things taking wide scope. And it wouldn't help to think of eventives as some kind of 'indefinite' (even though indefinites at least descriptively have exceptional scope powers). Indefinites appear to be able to take both wide and narrow scope in the antecedents of conditionals, while the claims about events in the antecedents of ((4), (15)-(19)) cannot be given a 'narrow scope' interpretation (in the sense that it is not possible to ignore some kind of 'anchoring' to the actual world).

A more promising alternative is to investigate 'wide scope' effects in ((4), (15)-(19)) as arising from reference to events. Referential expressions are scopally inert, and a 'widest scope' effect would be immediately predicted. I

will follow this intuition in my analysis (§3), and propose that simple eventive antecedents make reference to events (while perfect antecedents quantify over events and stative antecedents do not make claims about events at all).[7] The contrast between the antecedents of (3) and (4) in terms of event reference predicts a difference in the corresponding antecedent propositions, and leaves the door open for a unified LS-analysis of the modal.

Before turning to the proposal however, one last remark. The idea that by making reference we can, in a way, bypass the effects of modals has played a role in the analysis of expressions other than verbal morphology. To illustrate, I present the case of proper names and demonstratives. Borg (2002) has discussed the contrast between definite descriptions and proper names:

(20) a. The Prime Minister of the UK in 2000 could have been a Conservative.
b. Tony Blair could have been a Conservative.
(modality is metaphysical, not epistemic)

Borg usefully comments on these examples in the following way, clarifying the notions of *object dependent* and *independent* propositions, which I will appeal to later:

(21) "[(20a)] expresses an object-independent proposition about whoever is Prime Minister at a certain time, it is made true by any world where the Prime Minister in 2000 is a Conservative. So, e.g., it is made true by a world w_1 in which Margaret Thatcher is the longest serving PM in history and is still clinging on to power as the leader of the Conservative party and the country at the turn of the Millenium. It is also made true by a world, w_2 (perhaps a very close possible world), in which Tony Blair is the Prime Minister in 2000 and he is also a Conservative. Now [(20b)] is also true in w_2 but this has little to do with how things stand with the Prime Minister and everything with how things stand with Tony Blair. [(20a)] expresses an object-dependent proposition about Tony Blair. It will be true in a world where this very man, be he politician, policeman or pig-farmer in that world, is a Conservative. [(20b)], because it contains a genuine referring term, can never express a proposition about any object other than the one it picks out in the actual world."
(Borg 2002:496)

Demonstratives provide another example of a peculiarity that appears to be about scope, but that has been given a solution in terms of reference. Kaplan (1989) famously noted that demonstratives and definite descriptions differ with respect to their ability to take wide/narrow scope with respect to modals:

[7] The idea that we can either quantify or refer to events is inspired by the debates in the tense literature as to whether we quantify or refer to times. For a discussion of the tense case, see Kusumoto (1998, 2005).

(22) a. [Pointing at John throughout] If John and Mary switched places, that person would be a woman.
b. [Pointing at John throughout] If Johh and Mary switched places, the person I am pointing at would be a woman.

While the definite description in (22b) can take narrow scope with respect to the modal, the demonstrative in (22a) is scopally inert. Kaplan explained the contrast by arguing that demonstratives (and indexicals) were 'directly referential', taking their reference from the context of use.[8]

3. An aspect-based account

In the previous section I have presented some motivation for invoking event reference in explaining differences amongst *would*-conditionals. In this section I will develop a proposal according to which aspectual heads, responsible for relating events to times, can either refer to events (§3.2) or quantify over them (§3.4).

The word *aspect* has many meanings, so let me clarify: the crucial player here will be 'viewpoint aspect' (a.o. Comrie (1976), Smith (1991)). Roughly, viewpoint aspect gives us a temporal perspective on an event, it tells us how the time of an event relates to a reference time (this will become clearer below). Usually, it is said that viewpoint aspect differentiates between *perfective*, *imperfective* and *perfect* points of view. These are the only kinds of aspectual distinctions that will interest me here. I will have nothing to say about the effects of lexical aspect, or aspect in any other sense. Given the close relations that can be traced between viewpoint aspect and lexical aspect, this leaves my proposal much poorer, and more work is needed.

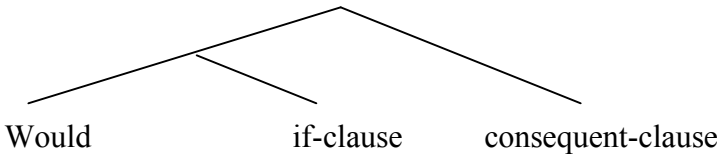
3.1 Preliminaries

There are many dimensions to the interpretation of *would*-conditionals. Here I spell-out some simplifying assumptions about syntactic structure and tense in order to provide a concrete setting for the discussion of aspect.

I will assume that *would* has two arguments, and participates in tri-partite structures at LF. It shows up in structures like (23):

[8] Referring expressions that are scopally inert with respect to so-called metaphysical modality appear to interact scopally with epistemic modals. Some examples:
(i) Hesperus might be Phosphorus. (Wolter 2003)
An example by Heim (see Roberts (2002), Wolter (2003)) :
(ii) That chair (pointing to the left) could well be that chair (pointing to the right).(*uttered in a room in which there are two panels in which we see two chairs, but we don't know whether we are looking at multiple chairs or at one that is a reflection of the other)*
Scopal options with respect to epistemic modality are suggestive but outside the scope of this paper.

(23)



Proposals like this have often been presented in the literature, inspired by observations made by Lewis (1975). But they are usually considered acceptable only as an idealization. Fully understanding the interpretation of conditional structures clearly requires a more complex syntax, and as well as a dynamic perspective that takes into account the role of context (discussions of syntax can be found a.o. in Iatridou (1991), Bhatt and Pancheva (2001), von Fintel (1994)). In spite of this, it makes sense to adopt (23) and simplify things here. Dynamic proposals often take *propositions* as a starting point, and go on to explain how propositions affect the context of utterance (they characterize context update at the propositional level). My claims in this paper are at and below the propositional level. For this reason, I consider that it is possible to have a fruitful discussion setting aside the specifics of dynamics and adopting simplified structures like (23).

A few words about tense. Antecedent clauses in *would*-conditionals seem to have the markings of regular deictic tense, but not the meaning of regular deictic tense. This observation is well-known, and documented (*The Cambridge Grammar of the English Language* considers that tenses in *would*-conditional mark 'modal remoteness', the *Oxford Companion to the English Language* talks about 'hypothetical' interpretations, *A Comprehensive Grammar of the English Language* classifies tenses as 'backshifted'). Dudman (1984) offers us the following overview:

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

From a temporal perspective, the rough pattern is that simple tenses allow for hypothesis about present and future, whereas perfect hypothesis can be about present, future or past. To get a more accurate picture, however, the difference between simple vs. perfect tenses needs to be considered together with differences in lexical aspect. As (24) shows, simple statives (*be here*) can be set in the present but simple eventives (*miss the bus*) can only shift towards the

future. The relevance of lexical aspect has been addressed, amongst others, by Iatridou (2000), Condoravdi (2002), and Gennari (2003). The aspect contrasts that concern me here, however, don't appear to depend on anything specific about the lexical dimension, and I won't have anything to say about that.

Why do tenses in conditionals shift? There is a tradition in the literature that claims that modals affect the reference time of subordinate clauses (both of their sister clauses and in sequence of tense examples in embedded clauses). The view can be traced through Abusch's 'extended now' theory (Abusch 1996), according to which *will* introduced an interval that begins at the speech time and continues unchecked into the future, as well as various views that claim that modals shift reference times (a.o. Ogihara (1996), Enç (1996), Condoravdi (2002), etc.). The proposal here falls in that tradition, and *would* will be characterized as responsible for setting the temporal parameter of the subordinate clauses (the time at which the clauses are true, which I will call their 'reference time') at a non-past time (with lexical aspect playing a role in determining exactly whether this can be the speech time or a future time). For the sake of concreteness, I will make two assumptions: (i) clauses sisters to the modal in (23) denote properties of times, and (ii) the interpretation of the modal is made relative to a salient non-past time that serves as the reference time for the subordinate clauses. The latter simplification is simply a technical solution to avoid well-known problems raised by existential quantification in conditional structures. While it seems reasonable to say that the modal shifts the reference time of the embedded clause, more work is needed to establish how exactly the shift takes place. Context does not always seem to provide a salient non-past reference time. My proposal about times is only a stop-gap solution to allow us to concentrate on the interaction between aspect and modality.

Given the assumptions above, we end up with denotations like the ones sketched in (25) and (26):

(25) Denotations for subordinate clauses
[[*if-clause*]] = λt λw (….t….w)
[[*consequent-clause*]] = λt λw (….t….w)

(26) LS-semantics for *would*
Where t_i is a contextually-salient non-past time, and P and Q are properties of times (i.e. type <i, <s, t>>:
[[**would**]](*P*)(*Q*)(w) = 1 iff for every possible world w' such that w' is a most similar world to w in which $P(t_i)$ is true, w' is also a world in which $Q(t_i)$ is true.[9]

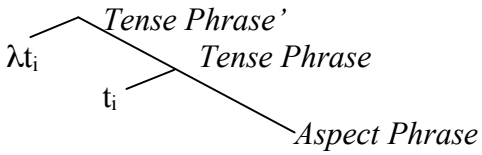
What we usually refer to as the *antecedent clause proposition* is the proposition obtained by applying the property of times that is the denotation of the

[9] I am using the short hand *w is a most similar world to w' in which ϕ is true* to identify possible worlds *w* in which ϕ is true such that there is not other possible world *w"* in which ϕ is true that is more similar to *w'* than *w*.

antecedent clause to the contextually salient non-past time that is invoked by the modal.

Why do antecedent clauses denote properties of times? I will adopt a referential approach to tense, according to which tenses are interpreted as temporal pronouns (referring expressions in the domains of times, see a.o. Partee (1973), Heim (1994), Kratzer (1998)). Tense morphology in the antecedent clause is not deictic, it corresponds to a variable tense, bound by a higher abstractor. The resulting denotation is a property of times (a *bound-variable* interpretation for tense):

(27)

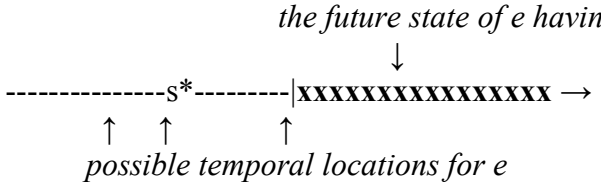


One of the big questions in the literature on *would*-conditionals is why the morphological tense features in the antecedent clause are past. In Arregui (2004), I have argued that tense morphology in the antecedent shows up as past because of agreement between the tense variable and a higher deictic past tense taking scope over the entire conditional. For reasons of space (mostly), I will not discuss the semantic implications of that proposal here, and I will set aside this interesting issue.[10] It is not tense that makes a difference between (2)/(4) and (3)/(5) (this will be taken up in §4.1).

The proposal for *would* and the assumptions about the subordinate clauses, together with the descriptive observations about the relevance of lexical aspect, give us some insight into the temporal pattern for the simple tense cases we noted in (24): *would* sets the reference time of the subordinate clauses at a non-past time, stative antecedents allow for both present and future interpretations, eventive antecedents go towards the future. What about the perfect cases? In §3.5 I adopt a view according to which the perfect invokes a *resultant state* (Parsons (1994), Kratzer (1998)). This is the state that follows the time at which an event has happened (the state of an event *having happened*). This view allows the temporal dimension of perfect antecedents to fall into place. The modal shifts the reference time of the resultant state to a non-past time (this means that the state of an event having happened holds either at the present or at some future time) and this is compatible with the event having happened in the past (if the reference time is present), or in the past, present or future (if the reference time is a future time). Here is a picture with a future reference time:

[10] For a discussion of the interpretation of tense features on tense pronouns see especially Heim (1994) and Kratzer (1998). For relevant more recent discussion (on tense and features in general), see a.o., Sauerland (2002), Schlenker (2003), Rullmann (2004), Heim (2005) and Kratzer (2006).

(28)



Setting the state of an event having happened in the non-past does not really provide us with much information about when the event itself took place. From a temporal perspective, it is surprising that the presence of perfect morphology makes such a difference to the interpretation of *would*-conditionals, since it doesn't appear to add much information.

3. 2 On the relevance of perfective aspect

Having set some pieces in place, we can now turn to our problematic case:

(4) You: Don't worry about looking after my plants. They died yesterday.
Me: #I am sorry, but also a bit relieved. If your plants died next week (instead), I would be very upset.

We've noted that access to other worlds is limited to worlds in which your plants died yesterday and next week, with the (infelicitous) suspicion that we are assuming that the actual world could be one such world. In the next section I'll argue that tense is not responsible for this. In this section, I'll blame aspect.

Descriptively, verbal morphology in the antecedent in (4) seems to conflate information about both tense and aspect. I will take that at face value, assuming the morphology spells out both an aspect and a tense head. Bennett and Partee (1978) (a.o.) have presented arguments showing that the default understanding in simple tense eventive clauses is that the time of the event is included within the reference time. Bennett and Partee's arguments are based on aspectual restrictions on the English present tense. They noted, for example, that sentences like (29) cannot be understood as reporting that an event of me building a house is currently going on:

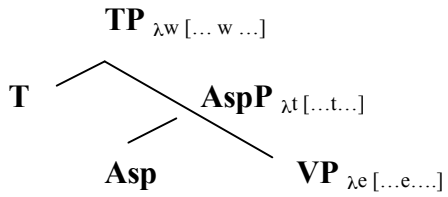
(29) I build a house.

The explanation, they propose, is that the running time of such an event would not fit into the time corresponding to the speech time (the present time). The account favors the view that, in the default understanding, it is the time of the event that has to fit into the reference time. Since, it has been argued, this is the relation corresponding to perfective aspect (Klein (1994), Kratzer (1998)), I will take perfective heads to be the default setting for viewpoint aspect.[11]

[11] The issue of cross-linguistic variation is expected to have consequences here. Aspectual restrictions on simple tenses vary cross-linguistically. This has been noted, a.o., by Giorgi and Pianesi (1997). The cross-linguistic picture, however, lies outside the scope of my work here.

To make a concrete proposal about how aspect manipulates events, we need to fit aspectual heads into the overall composition of the interpretation of the antecedent clause. We have already said something about tense. For aspect I will follow the hierarchy proposed in Kratzer (1998), in which aspectual heads mediate between predicates of events (at the VP level) and times (at the TP level).

(30)



In Kratzer's framework, aspectual heads manipulate event variables, establishing the relation between the running times of events and the reference time of the clause.[12] Perfective aspect quantifies over events in the metalanguage in the following way (Kratzer 1998):

(31) Where *P* is a property of events and τ is a function from events to their running times,
[[**perfective**]] (P) =
λt λw ∃e (P(e)(w) & τ (e) ⊂ t)

The aspectual head combines with a property of events, to result in a property of times that is true of a time in a world iff there is an event with the relevant event-property, and the running time of the event is included in the time.

What would it mean to have a referential account of perfective aspect? One way to implement this is to propose that perfective aspect introduces an event pronoun that saturates the event argument of the VP. Here is my first attempt, modifying Kratzer's proposal:

(32) *Preliminary*
Where *P* is a property of events and τ is a function from events to their running times,
$[[\textbf{perfective - } \mathbf{e_i}]]^{g, w}$ (P) =
λt λw' (P($[[\mathbf{e_i}]]^{g, w}$)(w') & τ ($[[\mathbf{e_i}]]^{g, w}$) ⊂ t)

According to (32), a perfective aspectual head introduces a deictic event pronoun, a free variable (in the object language), ranging over events. The proposal in (32) differs from (31) in making the denotation of the perfective phrase dependent on the denotation of the referential event pronoun. In this sense, (32) can be said to be *object-dependent*.

[12] Kratzer's specific proposal for the semantics of aspect is inspired by Klein (1994). There are various intuitions in the literature that describe perfective aspect as viewing an event 'from the outside', or 'through a camera' that also seem to point to the idea that the reference time includes the event.

The propositions corresponding to the antecedent clause in conditionals will accordingly be affected by the semantics of aspect. Given (32), the antecedent clause proposition in (4) would be (33):

(33) Where t_i is a non-past time,
$\lambda w'$ (your-plants-die-next-week $([[\mathbf{e_i}]]^{g, w})(w') \ \& \ \tau([[\mathbf{e_i}]]^{g, w}) \subset t_i$)

The event pronoun identifies an event (via the salient variable assignment), and the antecedent clause proposition is true in worlds where that event has the property of being an event of your plants death next week. With (32) we have managed to make sense (in a preliminary way) of the idea that aspect can be 'referential'. However, nothing in (33) predicts that the event description should take 'wide scope' in the manner described in §2.3. Without a story about events and event pronouns, we don't yet have an account of (4). I turn to that in the next section, where I show that a Lewis-view of events, together with a proposal very much like (32), can get us where we want to go.

3. 3 A Lewis-style approach to events and the semantics of aspect

There are many ways of thinking about events, suited to different purposes. Here are Lewis's opening sentences on his paper *Events*:

(34) "Events are not much of a topic in their own right. They earn their keep in the discussion of other topics: sometimes in the semantics of nominalizations and adverbial modification, sometimes the analysis of causation and causal explanation. There is no guarantee that events made for semantics are the same as the events that are causes and effects."
(Lewis, *Events* (1986: 241))

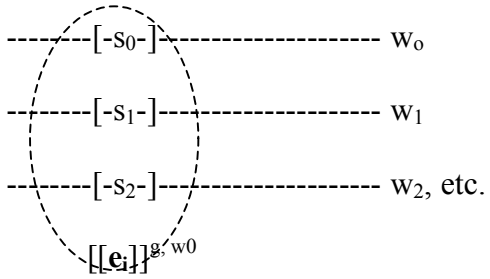
In *Events*, Lewis begins by characterizing events as particulars. An event is a "localized matter of contingent fact. It occurs. It is contingent that it occurs; no event occurs in every possible world." He later relates events to spatiotemporal regions in worlds: an event *occurs* in a particular spatiotemporal region in a world and no event occurs twice (in two different spatiotemporal regions of a world). Not all spatiotemporal regions are of the sort that an event can occur in, and Lewis discusses various properties that spatiotemporal regions must have if an event is to occur in them. But, noting the close connection between events and spatiotemporal regions, he concludes that it is possible to characterize events by reducing them to properties of spatiotemporal regions. Thus, without really giving up on the notion that events are localized matters of contingent fact, it is also possible to characterize events as properties of spatiotemporal regions (i.e. the ones they 'occur in').

(35) "To any event there corresponds a property of regions: the property that belongs to all and only those spatiotemporal regions, of this or any other possible world, in which that event occurs. Such a property belongs to

exactly one region of any one world where the event occurs, and there are some such worlds. It belongs to no region of any world where the event does not occur, and there are some of those worlds also."
(*Events*: 244)

Lewis-events can give us a particular perspective on how denotations are organized, and we'll see that this is very fruitful. Events, as characterized above, are not strictly speaking part of any particular world. This way of thinking is insightful at the moment of understanding the effects of event reference in eventive antecedents, and I will claim that the event pronouns introduced by perfective aspect denote Lewis-events. The schema below provides an illustration of what a pronoun denotation looks like (where *w* is a possible world, and *s* is a spatiotemporal region in a possible world):

(36)



A Lewis-event approach does not predict that event pronouns pick out regions in every possible world. As Lewis noted, events are contingent, and it is to be expected that for some possible worlds, there will be no spatiotemporal region of which an event pronoun is true. However, I will claim that the possibility of felicitously using a deictic event pronoun presupposes that it is true of some spatiotemporal region in the actual world (evaluation world). A deictic pronoun presupposes an 'aboutness' relation with something that there is (an 'occurrence' of the event). Because of this aboutness relation we can say that the propositions expressed by clauses with free event pronouns are, in a sense, 'object dependent' (as described by Borg in (20)).

The presuppositions of free event pronouns are spelled out below:

(40) For any event pronoun $\mathbf{e_i}$,
$[[\mathbf{e_i}]]^{g,w}$ is defined only if $\exists s\ (s<w\ \&\ [[\mathbf{e_i}]]^{g,w}(s) = 1)$
(*where s ranges over spatiotemporal regions in worlds and < indicates a part-of relation*)

I will return to the matter of the presuppositions of event pronouns in my discussion of cases like (2), when we don't know whether something has happened or not (§3.5). Right now, let's take a look at how the pieces fit together. The denotations of VPs can remain similar to those proposed by Kratzer (1998), but with the assumption that event variables in the metalanguage range over Lewis-style events. The denotation of the VP in (41)

is a function from events (which are themselves functions) to truth values, that returns truth in case the spatiotemporal regions picked out by the event variable are spatiotemporal regions in which the plants die:

(41) $[[_{VP}$ **your plants died**$]] = \lambda e$ (your-plants-die (e))

The intuition behind the metalanguage predicate could be expressed in the following way:

(42) For any event pronoun $\mathbf{e_i}$,
'your-plants-die' $([[\mathbf{e_i}]]^{g, w}) = 1$ iff
for every s: $[[\mathbf{e_i}]]^{g, w}$ (s) = 1, your plants die in s

Before continuing, let me mention a possible concern. In a sense, the view presented here treats the property described by the verb as an *essential* property of the event. An event in the denotation of the predicate in (41), for example, will only be true of situations in which your plants die. All the worlds in which the event has an extension will be worlds in which your plants die. However, we are able to make counterfactual claims about events, of the sort *This event of your plants dying could have been an event of your plants flourishing (if you had looked after them better*). Is this predicted to be impossible by the view presented above? It is worth noting that Lewis himself did not think that (necessarily) events have their properties essentially, not even those properties 'corresponding to verbs' (*constitutive properties*):

> "Even the alleged constitutive property is not beyond suspicion. Perhaps any change, or any death, or any shooting, is such essentially. Perhaps not. But what if some much more specific, detailed predicate appears in the nominalization? Sebastian strolled because he had plenty of time. Had he been delayed, the walking that was in fact a strolling might have been a striding. It might not even have been a walking, but rather a running. That is not to say, clearly, that it would not have occurred at all." (Events: 250-251)

While the matter needs more careful consideration, the view presented here is not (necessarily) incompatible with Lewis's views, nor does it entail a problematic essentialist approach to events. Lewis suggests that some events may have their properties essentially, whereas others don't. It could be that for events in the denotation of verbs, the description corresponding to the verb is indeed an essential property, whereas for other events it is not. An analysis of counterfactual claims and nominalizations would have to take this into account. When we claim *This event (e1) could have been that event (e2)*, we may be claiming that the actual world occurrence of e1 somehow matches (maybe through counterparts) some other worldly occurrence of e2. In any case, given the transworldly nature of Lewis-events, it would not be feasible to say literally that some event could have been some other event. This wouldn't make sense

with the standard analysis of modal talk as 'truth in some possible world' (transworldly events are not in possible worlds).

A Lewis-event view of the reference of event-pronouns has the advantage of allowing us to maintain a 'conjunctive style' (Davidsonian) analysis of event-modifiers, which will simplify the treatment of temporal adjuncts:

(43) [[**yesterday**]] = λe (yesterday(e))
[[**next week**]] = λe (next-week(e))

The event predicates in this case should be understood as restricting the temporal location of the extension of the event in different worlds (i.e. situations included within yesterday, situations included within next week). A conjunctive analysis would yield predicates like (44):

(44) [[**your plants die next week** / **yesterday**]] =
λe (your plants die (e) & next-week / yesterday (e))

This predicate will be true only of events that are events of your plants dying and which take place next week/ yesterday.

The preliminary proposal for perfective aspect in (32) can now be adjusted as shown below:

(45) $[[\ \textbf{perfective} - \textbf{e}_i]]^{g,w}$ (P) =
λt λw' (P($[[\textbf{e}_i]]^{g,w}$)
& ∃s(s < w' & $[[\textbf{e}_i]]^{g,w}$ (s) = 1 & τ(s) ⊂ t))

As we see in (45), perfective aspect maps predicates of events to properties of times, saturating the event argument in the predicate. Given an event predicate and a time, it returns a proposition that is true in a world if the event pronoun is assigned by *g* an event (function) of which the predicate is true, there is a spatiotemporal region in the world of which the event referred to by the event pronoun is true, and the temporal span of the spatiotemporal region is included within the time.[13]

We can finally put the interpretation of the antecedent clause together with the LS-interpretation of the modal (I have simplified matters with the consequent clause). Here is what we can now say about the case of (4):

(46) $[[\ \textbf{would}\ [_{\text{if-clause}}\ \textbf{perfective} - \textbf{e}_i\ [\ \textbf{your plants die next week}]]$
$[\textbf{I be very upset}]]]^{g,w0}$ (w_0) = 1 iff

[13] I am assuming one can talk about temporal intervals and the temporal span of situations. More could be said about this.

For a contextually salient non-past time t_i,
For every possible world w' such that w' is a most similar worlds to w_0 in which [λw (your-plants-die([[$\mathbf{e_i}$]]$^{g,\ w0}$) & next-week ([[$\mathbf{e_i}$]]$^{g,\ w0}$) & ∃s(s<w & [[$\mathbf{e_i}$]]$^{g,\ w0}$ (s) = 1 & τ(s) ⊂ t_i))] is true, w' is <u>also a world in which I am very upset</u>.

Whether the antecedent clause proposition can be true <u>at all</u> will depend on the value assigned by the contextually salient *g* to the pronoun (this is not world-dependent). Only if the pronoun is assigned a function true of spatiotemporal regions in which your plants die next week, will there be worlds in which the antecedent proposition is true. Given such an assignment, the antecedent clause proposition will be true in the worlds that have as parts a spatiotemporal region in the denotation of the pronoun (temporally included within t_i). Given the deictic nature of the pronoun, the antecedent carries the presupposition that the actual world (evaluation world) is one such world. Given the denotation of perfective aspect, it will be possible for the antecedent proposition to be true in worlds other than the evaluation world too.[14] However, (4) is predicted to be infelicitous in a context in which it is accepted that the actual world is not a world in which your plants die next week.

This analysis of (4) places the burden of 'anchoring' the antecedent to the actual world on (referential) aspect. The modal itself, with an LS-semantics, could in principle quantify over worlds in which the plants die next week instead of yesterday. But if we have accepted that the actual world is not a world in which your plants die next week, the antecedent won't be defined (and we'll get the infelicitous effect we see in (4)).

Before turning to (3) (*the perfects*) and (5) (*the states*), one last remark. The presence of an event pronoun does not <u>itself</u> require a deictic interpretation. I am assuming that event pronouns are like regular people-pronouns, and it would be reasonable to find bound-variable readings, etc.

3. 4 Properties of times

As we have seen, a referential view of perfective aspect can help with simple eventive antecedents. We turn now to the case of perfects and states. Intuitively, these seem to behave better from the LS-perspective, and I repeat the examples below:

(48) a. *Perfect antecedent*
If your plants had died tomorrow, I would have been very upset.
b. *Stative antecedent*
If your plants had enough light, they would be doing much better.

[14] Given the system set up here, the antecedent proposition is presupposed to be true in the evaluation world, but it can also be true in other worlds. The antecedent does not uniquely single out the evaluation world.

The antecedent clause in (48a) gives the modal access to worlds in which your plants die tomorrow instead of yesterday, and the antecedent clause in (48b) gives the modal access to worlds that differ from the actual world in that your plants currently have enough light.

To discuss (48a) it will be necessary to say something about the English perfect. This is a complex matter, since, as it has often been noted, the English perfect carries a multitude of shades of meanings (noted, classically, by McCoard (1978), more recently by Iatridou et al. (2001), Iatridou (2003), Izvorski (1997), Portner (2003), Pancheva (2003), Pancheva and von Stechow (2004) a.o.). Here, I will be brief, and focus only on the 'result' dimension of the interpretation of the perfect, represented by the views found in Parsons (1994) and Kratzer (1998). According to Parsons (1994), perfects introduce *resultant states*:

(49) "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)

The view put forward in Kratzer (1998) embodies a similar, 'result' intuition, but spelled out in terms of properties of times. I will make use of Kratzer's proposal here, and adapt it to the Lewis-style events I have adopted:

(50) [[**perfect**]](λe (your-plants-die (e))) =
λt λw ∃e (your-plants-die(e)
& ∃s(s < w & e occurs in s & τ(s) < t))

As in the case of the perfective, the perfect combines with a predicate of events and returns a property of times. Given a time *t*, this property results in a proposition that is true in a world if there is an event of your plants dying such that there is a spatiotemporal region in the world in which the event occurs and the spatiotemporal region precedes *t*. Combining with predicates of events, perfect aspect relates events to worlds, making a claim about their temporal location. No reference is made to events, the event variable is existentially bound in the metalanguage.

Given the proposal in (50), the quantificational domain of the modal in (3) will be identified as is indicated below, with the corresponding truth conditions:

(51) [[**would** [$_{\text{if-clause}}$ **perfect** [**your plants die next week**]]
[**I be very upset**]]] (w_0) = 1 iff

> For a contextually salient non-past time t_i,
> For every possible world w' such that w' is a most similar worlds to w_0 in which λw ∃e (your-plants-die(e) & next-week (e) & ∃s (s<w & e occurs in s & τ(s) < t_i)) is true, w' is <u>also a world in which I am very upset</u>.

The antecedent clause proposition is true in every possible world in which some event of your plants dying next week is true of a spatiotemporal region before t_i. All that the antecedent requires to be true in a world is that there be some event of your plants dying (i.e. that there be some spatiotemporal region in the world where the death of the plants next week occurs). I am assuming that the existential quantifier in (51) can range over 'merely possible' events, and the event function need not have an extension in the actual world. Indeed, if the plants actually died yesterday, we can safely say that any event of which the predicate *your plants die tomorrow* holds will be an event that will fail to be true of a spatiotemporal region in the actual world. Assuming that the temporal location of the death of the plants at some other time is not necessary, there will be some worlds in which the antecedent clause proposition is true, and the modal in (51) will quantify over the most similar such worlds to the actual world.

We turn now to the case of states (5). Let me begin by noting that it is suggestive that stative and perfect antecedents pattern together, since there is a tradition in the literature linking perfects and statives (encouraging from my perspective, references include Parsons (1990), (1994), Vlach (1993), and more recently Katz (2003)). I won't be able to do justice to the complexity of states. I will suggest, however, that in the relevant sense they are similar to perfects. Though it is possible to make a sortal distinction between states and events, Parsons (1990) has suggested that the linguistic motivation for states is weaker than what we find for events. Katz (1995) has treated states directly as properties of times, and I will adopt that approach here (see also Katz (2000)). Though this might be a simplification, what really matters to me is that states fail to be perfective, and this seems reasonable, since they typically fail to pass the standard tests of perfectivity.

Adopting the view that stative antecedent clauses denote properties of times, we end up with the denotation in (52):

(52) [[**your plants have enough light**]] =
λt λw (your-plants-have-enough-light (t)(w))

The conditional in (5) will be true in the following circumstances:

(53) [[**would** [$_{\text{if-clause}}$ **your plants have enough light**]]
[**they be doing much better**]]](w_0) = 1 iff

For a contextually salient non-past time t_i,
For every possible world w' such that w' is a most similar worlds to w_0 in which λw (your plants have enough light (t_i)(w)) is true, w' is <u>also a world in which they are doing much better</u>.

There is nothing in (53) that makes the antecedent clause object-dependent. No reference is made to events, and no event-presuppositions are projected on the actual world. The most similar worlds to the actual world in which the antecedent clause proposition is true (under the assumption that the reference time is the speech time) will be worlds that differ from the actual world with respect to the current state of the plants lighting situation, and these are the worlds *would*-will quantify over.

3. 5 What happens when we are unsure?

We've started the discussion with the perfective example in (4), and we have some idea about why this case is odd. But what happens when perfective antecedents do not result in odd conditionals? We turn now to the case of (2).

I have made event reference the crucial difference between (2)/(4) and (3)/(5). What matters is the presence or absence of the corresponding deictic presupposition. Since the definedness conditions on the event pronoun appeal directly to the actual world (technically, the evaluation world), the event presuppositions associated with perfective antecedent are expected to project 'all the way'. The presuppositions are understood to be about the actual word, and, in a dynamic setting, the antecedent is expected to place constraints on what is taken to be true about the actual world in the conversational common ground (à la Stalnaker). This analysis provides an 'epistemic dimension' to examples like (2)/(4), predicting infelicity if we have accepted that there is no event with the relevant properties (as in (4)). But what happens when we are unsure, as in (2) (i.e. when both options are compatible with the context set)?

Before turning to (2), a note on the side. The observation that *would*-conditionals can carry epistemic information is to be found in various places in the literature, influentially in Stalnaker (1975), who has argued that the morphology in *would*-conditionals (which he calls 'subjunctive') indicates that the selection function responsible for identifying the domain of quantification of the modal can access worlds outside the 'context set' (the set of worlds compatible with what is taken to be actually true):

(54) "I take it that the subjunctive mood in English and some other languages is a conventional device for indicating that presuppositions are being suspended, which means, in the case of subjunctive *conditional* statements, that the selection function is one that may reach outside of the context set." (Stalnaker 1975: 276)

This view contrasts subjunctive and indicative in terms of conventions governing their use (not in terms of their semantics). A similar approach is discussed in Kratzer (1979), who presents a series of rules of use for

subjunctive conditionals, relating antecedent clauses and presuppositions to what is known in the context of utterance.[15] As both Stalnaker and Kratzer note, such a view predicts that counterfactual conditionals must be expressed with subjunctive morphology (Kratzer 1979 actually characterizes 'counterfactual use' as the use of subjunctives when the antecedent is incompatible with what is known). However, the view doesn't directly address the difference between examples like (2)/(4) and (3)/(5) (Stalnaker doesn't discuss simple tense examples, and Kratzer's examples are all stative). The proposals are geared towards explaining the difference between indicatives and *would*-conditionals, not towards distinguishing between different kinds of *would*-conditionals.

The analysis I have presented here says nothing about the differences between indicatives and *would*-conditionals.[16] It only makes a distinction between simple and perfect *would*-conditionals -- in terms of aspect-triggered event presuppositions (the simple ones have them, the perfect ones don't). But there is an epistemic dimension to the proposal. Given a pragmatic approach relating presuppositions to context of use, the analysis predicts a difference in the 'epistemic effects' of the conditionals. Simple and perfect conditionals place different constraints on the common ground. We do obtain a difference, not through (unanchored) conventions of use, but through felicity conditions associated with event pronouns.

Ideally, we wouldn't need to say anything special about the presuppositions of *would*-conditionals. However, the matter is complex. What about presuppositions arising from expressions other than event pronouns? This topic has recently been studied by Ippolito (2003), who argues that we do need

[15] See also the Stalnaker-based discussion in von Fintel (1997), and references therein. Differences between indicatives and subjunctives in terms of epistemic background have also been proposed by Iatridou (2000), who uses the terms 'future less vivid' to contrast subjunctive examples with indicative ones. Differences in epistemic effects have also been discussed within indicatives, recently by Kaufmann (2005).

[16] Though I do not discuss the difference between *will* and *would* conditionals, it is important. A reviewer points to the example below:

(i) Your plants will certainly die next week. #If they died next week, you would not have to worry about watering them.

As has been noted in the literature, the choice of *would* over *will* can be used to indicate greater uncertainty. When we are sure that something will happen, we prefer *will*. The oddness of (i) seems to arise from the contrast between the first sentence indicating great certainty, and the choice of the antecedent form indicating greater uncertainty. With a *will* conditional, the sequence would be fine (though repetitive):

(ii) Your plants will certainly die next week. And, if they die next week, you will not have to worry about watering them.

While clauses about the future can indicate great certainty, they do not seem to have the same epistemic status as other claims. A reviewer points to:

(iii) The baby will be born tomorrow. Unfortunately, John won't be here. Only if the baby were born next week, would he be able to be at the hospital.

In spite of the claim about the future, we choose a conditional that requires compatibility with the common ground. In this case, however, *would* is preferred to *will*, since there is greater uncertainty about whether the antecedent is true:

(iv) The baby will be born tomorrow. Unfortunately, John won't be here. #Only if the baby is born next week, will he be able to be at the hospital.

something special. (Ippolito's proposal will be presented in some detail in §4.3). The discussion centers around examples like (55):

(55) a. If Charlie took his Advanced Italian test tomorrow, he would pass.
b. If Charlie had taken his Advanced Italian test tomorrow, he would have passed.
(Ippolito 2003: 146-147)

Ippolito notes that (55a) would be infelicitous in a context in which it was known that Charlie had passed away, whereas (55b) would be fine. Ippolito concludes that there is a difference between the conditionals with respect to how the presuppositions of the antecedent clause affect felicity (in this case the existence+aliveness presuppositions of the proper name). In the simple case (55a), the presuppositions must be compatible with the common ground at the time of utterance; in the perfect case (55b), they must be compatible with the common ground at a past time. But in spite of the contrast in (55), I hope we won't need to say anything this particular. The analysis I have proposed predicts that the difference between the examples could follow simply from event presuppositions: if an actual world event of Charlie taking his Advanced Italian exam tomorrow is to be compatible with the common ground, the continued aliveness of Charlie tomorrow should also be compatible with the common ground. On the other hand, if we are quantifying over the most similar worlds in which there is some event of Charlie taking his Advanced Italian test tomorrow, Charlie's aliveness tomorrow can be narrowly accommodated within the domain of quantification of the modal, and no presupposition need project onto the common ground. Cashing out the difference between (55a) and (55b) in terms of event presuppositions could allow us to maintain a uniform view about the presuppositions of proper names in *would*-conditionals and still explain why (55a) is infelicitous if we know that Charlie is dead, while (55b) is fine.[17]

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[17] While the idea sketched above takes care of some examples, it does not take care of all of them. As a reviewer pointed out, the contrast below is not explained:

(i) a. John is dead. If he were alive, he would be 90 years old.
b. John is dead. #If he were in love with Mary, he would marry her.

In spite of examples like (ib), it does not seem correct to say that in general the presuppositions of the antecedent of simple *would*-conditionals must be compatible with the common ground at the speech time. Examples with more descriptive content/ modal subordination seem to work better (I am not able to address this issue here):

(ii) a. (*During an argument:*) You say that because you don't have any children. If YOUR daughter were going to college, you would complain about increases in tuition fees.
b. Looking at adolescents these days, I am glad I never had any children. If my son or daughter looked like that, I would be feeling VERY upset.
c. A: Do you know that our son George now has an imaginary best friend called Simon?

We turn finally to (2). What happens when a *would*-conditional with a perfective antecedent is uttered in a context in which we don't know whether the antecedent is true or false? How does the 'indicative' (epistemic?) effect that Lewis mentioned arise?

(2) Suppose you are about to go on holidays, and ask me to look after your plants. I accept, but I am rather nervous. I am not very good with plants.

> You: Could you look after my plants next week, while I am gone?
> Me: Of course. But I am rather nervous. If your plants died next week, I would be very upset.

A perfect antecedent is only defined if there is a referent for the event pronoun. In terms of pragmatics, this requires at least that such an event be compatible with the common ground. But why doesn't the whole thing go wrong in contexts such as this one, in which there isn't a salient event of your plants dying next week?

I would not be happy with the idea that the participants in a conversation are able to simply (somehow) accommodate a referent in cases like this. It might be that the reference time introduced by the modal in the conditional helps to accommodate a referent, since it tells us something about when to look for an event and that might be enough (the referent for the event pronoun has the running time included within the reference time). But it is not convincing. An alternative analysis, more promising / suggestive, is to say that in understanding (2), we don't care too much about what event is chosen, and we make use of pragmatic strategies that allow us to overcome what is, strictly speaking, an infelicitous use of the event pronoun. The strategy I have in mind is diagonalization as discussed by Stalnaker (1978, 1987), and below I speculate on how diagonalization could help us find the antecedent proposition in cases like (2).

Stalnaker discussed diagonalization as a pragmatic strategy by which participants in a conversation may interpret (or reinterpret) an utterance if the interpretation obtained in the regular way somehow failed the usual rules of conversation. Diagonalization, for example, could be invoked in cases in which the usual interpretation would have resulted in a trivial or non-informative proposition (one of Stalnaker's particular concerns were identity statements). Here is an example, to illustrate this (my example combines parts from different examples by Stalnaker).

> B: It's a pity! If Simon were actually in his class, George would pay a lot more attention!
>
> d. A: I love deep gloomy cellars. Couldn't you let me see the cellar of thishouse?
> B: This house doesn't have a cellar. But if it were deep and gloomy, I would take you there straight away.

Suppose we hear our neighbour with somebody in the apartment next door, but we don't know who she is with. As far as we know, it could be Joe, Jim or Jack. Suppose that in w_1 she is with Joe, in w_2 she is with Jim and in w_3 she is with Jack, and those are the only options we entertain about what the actual world might be like. We clearly hear her say *you are a fool*. Given that we don't know the facts about who she is talking to, we don't strictly speaking know the content of what she has said (*that Joe is a fool, that Jim is a fool* or *that Jack is a fool?*). But we are not completely lost. We know something about how English works, in particular, second person pronouns (and we assume that she does too). So, we know that if the actual world is w_1, she has asserted the proposition that *Joe is a fool*, if it is w_2, the proposition *that Jim is a fool*, and if it is w_3, the proposition *that Jack is a fool*. Stalnaker uses *propositional concepts* to represent the interaction between the context and content of an utterance. For the utterance above (*you are a fool*), the propositional concept could be something like (56). The worlds on the vertical axis represent the possible contexts, and the horizontal lines spell out the proposition expressed in each of those alternatives (making arbitrary assumptions about how truth is distributed):

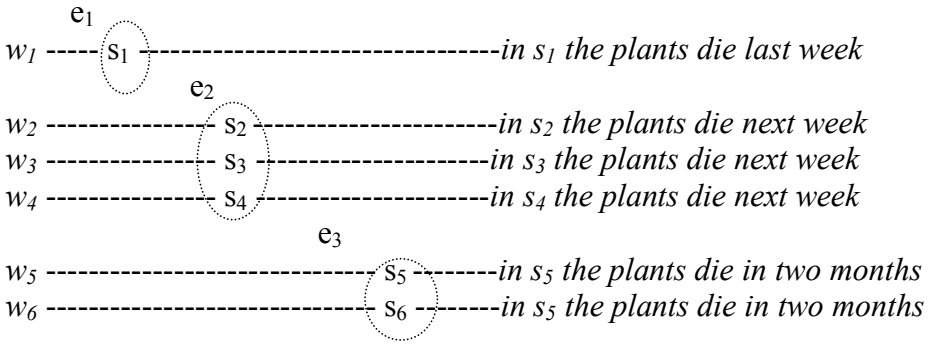
(56)

	w1	*w2*	*w3*
w1	T	F	F
w2	T	T	F
w3	F	T	F

According to Stalnaker, in the situation described above, where we don't actually know what the speaker has said, we can still recover information from her assertion by understanding that she expressed the diagonal of the propositional concept in (56). That is, we understand that she asserted a proposition that is true if we are in w_1, true if we are in w_2, and false if we are in w_3. Thinking about this in terms of context change, we would take our neighbour's utterance to instruct us to exclude w_3 from the context set – informally, we'd reason: *Jack is not a fool, so she cannot be talking to him*.

As with the case of people-pronouns above, diagonalization could help us with the reference of event-pronouns. Following Stalnaker, we will consider the worlds in the context set in their dual role of modeling the propositional content accepted in the context and of providing information about the context of utterance. Consider the utterance of (2) in a context in which we don't know whether the plants will die next week or not: the context set consists of w_1- w_6 below. Consider as possible values for the event pronoun the events e_1-e_3 identified below (this is a toy example, in principle we should consider all possible values for the event pronoun):

(57)



In w_1 the free event pronoun is assigned e_1 as a value, in w_2-w_4 the free event pronoun is assigned e_2 as a value, and in w_5-w_6 the free pronoun is assigned e_3 as a value. These assignments all respect the felicity conditions on the use of free event pronouns: the events have an extension in the evaluation world. Given these assignments, the propositional concept corresponding to the antecedent in (2) will be as in (58):

(58)

	w1	*w2*	*w3*	*w4*	*w5*	*w6*
w1	F	F	F	F	F	F
w2	F	T	T	T	F	F
w3	F	T	T	T	F	F
w4	F	T	T	T	F	F
w5	F	F	F	F	F	F
w6	F	F	F	F	F	F

Given the assignment to the pronoun in w_1, the antecedent of (2) expresses a proposition that is false in all possible worlds: e_1 is not an event of your plants dying next week. The same happens with the assignments in w_5 and w_6. Given the assignment to the pronoun in w_2- w_4, the antecedent of (2) expresses a contingently true proposition. It will be true in worlds in which the event has an extension, and false in worlds in which the event does not have an extension.

Given this propositional concept, the diagonal proposition will be true in w_2, w_3 and w_4, and false in w_1, w_5 and w_6. This, I claim, is the proposition that will function as the antecedent proposition for the conditional in (2). When evaluating the conditional with respect to the worlds in the context set, for each world in the context set we will look for the most similar world(s) within this proposition. When evaluating (2) with respect to w_1, for example, the modal

will quantify over the most similar worlds to w_1 within $\{w_2, w_3, w_4\}$. The same will be the case for all the other worlds.

It seems reasonable to say that in figuring out which worlds are in the diagonal proposition, we rule out possibilities corresponding to infelicitous utterances. Consider the possibility of w_7, a world in which the event pronoun refers to e_2, and suppose that e_2 does not pick out a spatiotemporal regions in w_7 itself. The predicate λe(your-plants-die-next-week (e)) is true of e_2, and there are worlds in which λw ∃s (s<w & e_2 occurs in s) is true. However, w_7 is not in the extension of the antecedent in (2), since such an assignment would violate the presuppositions of the event pronoun, and the antecedent can only be true in worlds in which an utterance leads to a true claim.

It is useful to remember that propositional concepts are not a kind of *meaning*, they are determined by utterance tokens and their specific context of utterance. Here is an illuminating quote from Stalnaker:

(59) "(…) And utterances don't have the content they have *because* they determine a certain propositional concept. This gets things backwards. Rather, an utterance determines a certain propositional concept because it has the content it has in the various possible worlds in which that particular concrete utterance exists."
(Stalnaker (1987: 182-183))

I mention this quote to support the idea that when we diagonalize to find the antecedent proposition in (2), worlds that have been discarded as candidates for the actual world (i.e. worlds that we know are not the actual world), won't be worlds in which the antecedent is true. The context we start out from in order to figure out what has been said is the context set (worlds in which *that particular concrete utterance exists*). This has important consequences. Imagine a world w_8 outside the context set. In this world your plants die next week. That is, there is some event e_4, such that e_4 is an event of your plants dying next week, and it picks out a spatiotemporal region in w_8. Given these facts, w_8 is in the denotation of *λw∃e(your-plants-die-next-week(e) & ∃s(s<w & e occurs in s))* (i.e. w_8 is in the antecedent clause proposition in (3) -- and, if w_8 is similar enough to the actual world, it will be in the quantificational domain of the modal in (3)). However, since the diagonalized antecedent of (2) is only true in worlds in the context set, w_8 will not be in the quantificational domain of the modal in (2).

In cases like (2), even though the modal allows for quantification over worlds that differ from the actual world, we identify the antecedent proposition contemplating only alternatives in which the utterance makes a true statement. The consequence is that the modal is forced to quantify within the set of conversationally accessible options. In this way, I speculate, diagonalization provides us with an understanding of the 'epistemic effects' in (2). But saying that the modal is forced to quantify over worlds in the context set (in which the antecedent proposition is true), does not mean that the antecedent proposition is true in every world in the context set. Considering the options set up in (58), it

could well be that the actual world turns out to be w_5 (a world in which the event pronoun can only be assigned a referent which is not an event of your plants dying next week - under the assumption that the plants die in two months, and do not die twice.).

The case of negation needs to be considered too (though briefly):[18] when we don't know what will happen, both examples (60) and (61) imply that I might or might not go to the meeting tomorrow, and neither can be used counterfactually (when we do know what will happen, *will* seems to be preferred, see footnote 16):

(60) If I went to the meeting tomorrow, I would write up the report myself.
(61) If I didn't go to the meeting tomorrow, I would have to write up a report.

I would like to suggest that in examples like (61), negation applies to the diagonal proposition defined by the clause in its domain, picking out the complement within the context set (see Heim (1992) for a dynamic analysis of negation). For this reason, the modal in (61) quantifies over worlds in the context set in which I do not go to the meeting, but the felicitous utterance of the conditional requires that there be some worlds in the context set in which I do go.

Invoking diagonalization to rescue (2) does not make incorrect predictions with respect to (4). In the situation described in (4), all worlds in the context set are worlds in which your plants fail to die next week (they are already dead). There will be no felicitous assignment to the event pronoun that will result in a proposition true in any world in the context set. As a result, there won't be any world in which the diagonal proposition corresponding to the antecedent is true, and the utterance of the conditional will be infelicitous (the quantificational domain of the modal will be empty).

There are a couple of concerns that I will immediately make explicit before closing this section. One is that it is not obvious that diagonalization should be thought of as generally available to rescue infelicitous pronouns. Out of the blue, examples with an 'unanchored' person-pronoun (like (62)) are startling, and this is potentially problematic:

(62) If she were here, I would be happy.

It is not clear to me that if somebody suddenly uttered (62) we would be happy to smoothly diagonalize the antecedent and consider all the options available as a referent for *she*. The difference in intuitions could be due to a difference between people-pronouns and event-pronouns, but the matter is worrying as it remains to be investigated.

The second type of concern has to do with whether it is legitimate to invoke diagonalization in the antecedents of *would*-conditionals as I have done.

[18] For other examples of diagonalization in subordinate contexts, see Stalnaker (1987), who discusses diagonalization in belief contexts. I am grateful to a reviewer for inquiring about negation, and bringing up examples (60) and (61).

I have invoked diagonalization as a way of resolving potentially infelicitous uses of free event pronouns. As a side-effect of diagonalization, the modal in examples like (2) is forced to quantify over worlds within the context set, and thus the 'epistemic' effects are derived. This is a welcome result. But Stalnaker's diagonalization proposal is closely tied to his proposal about assertion, and is motivated by intuitions about how we exchange information about the actual world. The antecedent propositions of *would*-conditionals are not meant to inform us about the actual world and it is not trivial to say that the kinds of reinterpretations that are justified when we are evaluating an assertion should carry over to cases in which we are making a hypothesis. More thinking is needed here too.

4. Could it be tense?

In this section I will discuss an alternative perspective, according to which the important difference between simple eventive cases like (2)/(4) and perfect cases like (3) is that (3) has an extra past tense showing up as a perfect. I will refer to this, loosely, as 'the tense analysis'. The section has three parts. In Section 4.1 I discuss a non-specific tense analysis, which argues that the perfect locates in the past the point at which the antecedent world histories branch off from the actual world (this general view can be found in various shapes in the literature). In Section 4.2 I discuss Ogihara (2000), which argues that the perfect locates in the past a true proposition that contrasts with what happens in the antecedent worlds. And in Section 4.3 I discuss Ippolito (2003), which argues that the perfect shifts towards the past the time at which felicity conditions must be satisfied. I will present arguments against the idea that the perfect is a past tense responsible for past branching, contrast or felicity.

4.1 It is not really about past tense

One of the interesting features of a tense analysis for (3) is that it fits well with some views (developed in the philosophical literature) about the histories of the worlds in the domain of quantification of the modal. In this section I will begin by describing such a view (briefly), and then explain why, in spite of the natural fit, the crucial feature of (3) is not really an extra past tense.

The philosophical literature on counterfactuals often pays attention to the histories of worlds. There is an intuition that the worlds quantified over by counterfactuals are like the actual world up to some point in the past, and then diverge in a way such that the antecedent clause proposition is true. An illustration:

(63) If the little performing dog had not tripped over, it would have gotten through the fire-hoop.

In the actual world, the little dog tripped, and didn't make it. But in the relevant antecedent worlds, things were different. In the histories of those worlds,

something happened before the time at which the little dog tripped in the actual world, and the little dog kept going.

Philosophers use the term *branching* to talk about the divergence in histories described above, and part of the philosophical literature has tried to identify how branching works. How abrupt is the divergence? How far back does it start? Here is a description to be found in Bennett (2003), introducing the notions of *forks* and *ramps*:

(64) "Here is some terminology. In the context of a given counterfactual A<C, a *fork* is an event at an A-world by virtue of which that world for the first time becomes less than perfectly like α. The corresponding verb explains itself. A *ramp* is the segment of that world's history starting at a fork and ending at the obtaining of A; and a world or ramp is *legal* if it conforms to the causal laws of α. Using this terminology: to evaluate a counterfactual A>C we must look to worlds at which A obtains by virtue of a legal ramp running from a fork that occurs not long before T_A [*the time at which the antecedent becomes true*]." (Bennett 2003:216)

I won't take a position about whether it is possible to characterize the worlds quantified over in the way Bennett describes.[19] My discussion is about the associated linguistic claim that (often) lies behind a tense analysis, and the claim has two parts: (i) the perfect is really a past tense, and (ii) it affects the accessibility of possible worlds by identifying the temporal location of the 'fork' in the antecedent worlds. From this perspective, the perfect does not make a contribution to the antecedent clause proposition. Instead, it is interpreted as a past tense 'outside' the antecedent clause, marking the point of at which the histories of the antecedent worlds diverge from the history of the actual world. To illustrate this with the example above, if the T_A in (63) is the relevant time at which the little dog failed to trip (the time at which it did trip in the actual world?), the perfect picks a past time (just) before the (small) event(s) by which in the antecedent worlds the dog managed to keep going (the recovering after the stumble, the pulling together of the nerves, etc.). Of course, there isn't a necessary connection between the view about domains of quantification and this analysis of the perfect. The view about domain of quantification could be right and this analysis wrong. But, given the view about domains, the tense analysis provides a very plausible account of what the perfect is doing.

An analysis of the perfect as a past tense has also lots of intuitive support. One of dimensions of the interpretation of the perfect is to invoke anteriority. The truth of the sentence *She has left* depends on her leaving before the speech time, the truth of *She had left* depends on her leaving some time before a past time. The truth of both perfect sentences and past sentences

[19] Bennett (2003) has a thorough discussion this view, with potential problems and solutions. See also Lewis (1979), who sets up an analysis of similarity that captures many of the relevant facts without directly prioritizing past history.

depends on there being past / prior events, and in this sense the perfect is somewhat close to the past tense.

However, there is evidence from sequence of tense, a phenomenon which is known to be sensitive to the presence of past tense, that indicates that the perfect is not really a past tense. Illustrations of sequence of tense are provided below:

(65) a. Sara realized that the little dog was dead.
b. Sara knew that her mother was having an affair.

Examples like these have an interpretation according to which the temporal location of eventuality reported by the embedded clause 'overlaps' with the temporal location of the matrix eventuality. Various proposals have been made about these examples (a.o. Abusch (1988, 1997), Ogihara (1996)), but the general understanding seems to be that tense morphology in the embedded clause does not receive a standard past interpretation, and the very presence and interpretation of past features in the embedded clause is dependent on the presence and interpretation of a past tense in the matrix (there is *agreement* of tense features).

Arguing against the idea that the perfect is a past tense is the observation that the perfect does not trigger sequence of tense phenomena. Consider (66):

(66) a. Sara has finally realized that the little dog was dead.
b. Sara has known that her mother was having an affair for quite a while.

In these examples, the embedded tense is not interpreted as overlapping with the time of the matrix. The temporal location of the eventuality reported by the embedded clause is past with respect to the event reported by the embedded clause. We naturally understand such sentences as making reference to some other salient past time: *Sara has (recently) found out that her mother was having an affair in those days*, etc. Though the truth of the perfect requires that there be some past event that gives rise to the perfect state (the moment when realization took place, the moment when Sara found out, etc.), we don't understand the event reported by the embedded clause to correspond to the time of the matrix clause event. The pattern is different from that we observed in sequence of tense examples, suggesting that we are not dealing with tense agreement and that the perfect is not a past tense.

Part of the (hypothetical) linguistic claim I am considering here is the idea that the perfect is interpreted 'outside the antecedent clause' (in one way or another, it sets the time of the *fork*). Examples with adverbial clauses argue against this, indicating that the semantic contribution of the perfect stays within the antecedent. I begin with *since*-clauses. In English, these are compatible with perfect tenses and unacceptable with simple tenses:

(67) a. Mary *has lived/ had lived/ will have lived* in Amsterdam since 1975.
b. #Mary *lives/ lived/ will live* in Amsterdam since 1975.
(Kamp and Reyle 1995: 628)

Yet, *since*-clauses are acceptable in the antecedents of perfect *would*-conditionals, suggesting that the semantic contribution of the perfect stays within the antecedent clause. This is illustrated by (68) and (69) below:

(68) 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.

(69) 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 their combination with perfect with stative verbs. Such examples give rise to two interpretations:[20]

(70) Mary has lived in Amsterdam for three years.
(Kamp and Reyle 1995: 650)
a. Somewhere in the past there was a three year period during which Mary lived in Amsterdam
b. Mary is living in Amsterdam now and this state has been going on for three years.

We are interested in the interpretation in (70b). According to Kamp and Reyle, in this interpretation the *for*-phrase modifies the duration of the resultant state corresponding to the perfect (as opposed to the duration of the state itself, as in (70a)). As the examples below show, this interpretation is also available in the antecedent clauses of perfect *would*-conditionals.

(71) 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 (71a) as making a hypothesis about a situation in which you are currently working here, and you started three years ago. Similarly, we can interpret (71b) as making a hypothesis about a situation in which you currently know her, and made her acquaintance at the same time I did. If we accept that

[20] I am borrowing the examples from Kamp and Reyle (1995), but these facts have been discussed in many places.

in these interpretations, the *for*-phrase modifies the state introduced by the perfect, then it is clear that the perfect must be part of the antecedent clause.

4. 2. The matter of 'instead': Ogihara (2000)

Counterfactual antecedents often invoke an intuition of contrast with what has actually happened, and cases pertaining to the future are no exception. In (3), for example, the antecedent clause proposition *that your plants die next week* could be said to contrast with the true proposition *that your plants died yesterday*. Ogihara (2000) places the notion of contrast at the centre of his analysis, and argues that the perfect is interpreted as a past tense that has the role of locating in the past a true proposition that contrasts (via focus) with the proposition corresponding to the antecedent clause.[21]

Ogihara's contrast-based proposal is inspired by Dretske's well-known Clyde and Bertha examples:

(72) 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.
(Dretske 1972: 432)

Dretske presented these examples together with a story according to which Clyde would inherit a large sum if he married before the age of 30, regardless of whom he married, and he chose Bertha out of convenience. Dretske's observation is that in this context, (72a) was judged true (*he wouldn't have been eligible if he hadn't married*), while (72b) was judged false (*Bertha was not particularly relevant*).

Inspired by Dretske and following up on Rooth's analysis of focus (Rooth 1992), Ogihara notes that focus in the antecedent makes salient a set of alternatives (in (72a) of the shape *Clyde X-ed Bertha* and in (72b) of the shape *Clyde married X*). Ogihara proposes that in examples like these, there is a silent *instead* in the antecedent clause that takes as input the set of contextually-restricted focus-based alternatives and gives as output a proposition that is true in a world iff the only alternative within the set that is true is the one corresponding to the antecedent (i.e. the antecedent proposition is true and all the others are false).

To see how this would help with our original problem, let's switch back to the temporal cases we have been considering. Here are Ogihara's versions of perfect *would*-conditionals pertaining to the future:

(73) a. *John thought that Mary's birthday was yesterday instead of tomorrow, and he gave her flowers. She wasn't happy that he had made a mistake.*

[21] Ogihara (2006) proposes a development of Ogihara (2000), but I won't be able to go into it here.

If John had given flowers to Mary TOMORROW$_F$, she would have been pleased.

b. *It is only possible to go on a single walk, and it has to be today or tomorrow. We went today, and it rained. The forecast for tomorrow is much better.*
If we had gone out for a walk TOMORROW$_F$, we would have had a good time.

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I will not spell out the formal details of Ogihara's analysis, and instead work informally through an example (Ogihara presents a very explicit formal proposal). Consider (703), and remember there is a silent *instead* in the antecedent. Given the presence of focus on *tomorrow*, the contextually restricted set of focus-based alternatives will contain propositions of the form *John give flowers to Mary at X*. Given the presence of 'past tense' in the antecedent (the perfect), one of the propositions in that set will be the true proposition that *John givePAST flowers to Mary*. Silent *instead* operates on the focus-induced set, and gives as output the proposition that is true in a world iff the only proposition in the set that is true in that world is the (antecedent) proposition that *John give Mary flowers tomorrow*. Though there is no incompatibility between John giving Mary flowers yesterday as well as tomorrow, the silent *instead* will exclude worlds like this from the antecedent proposition.

The silent *instead* hypothesis embodies a very plausible intuition about a contrast between the hypothesis we are setting in the future and what has actually happened in the past. It is the perfect (as a past) that sets the contrasting proposition in the past (in a sense, the perfect in this proposal is interpreted 'outside' the antecedent clause). However, the proposal has been criticized by Ippolito (2003), who notes that at times there is no contrasting true past proposition corresponding to the antecedent. Ippolito constructed examples like the following:[22]

(74) Imagine the following scenario. Charlie died a month ago, before ever going to Boston, 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 Boston tomorrow, he would have seen the Red Sox. Sally disagrees, and utters (12):

(12) No. If Charlie had gone to Boston THE DAY AFTER TOMORROW, he would have seen the Red Sox.
(Ippolito 2003: 151)

Ippolito's point is that the proposition that we intuitively feel to be contrasting is not true in the actual world. Indeed, there is no proposition of the form *that Charlie went to New York in the past* that is true in the actual world. Ogihara's claim that the perfect locates a contrasting proposition in the past in the actual

[22] See Ogihara (2006) for comments.

world does not seem right. This point can be generalized, as some examples indicate that it is not really necessary to have overt contrasting elements at all. Consider the following story, inspired by Dudman (1984):

(75) 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 other part of Ogihara's (2000) proposal, a silent *instead* in the antecedent clause, can also be problematic. To see this, let us go back to Dretske's Clyde and Bertha examples. Consider (72b):

(72b) If Clyde hadn't married BERTHA_F, he would not have been eligible for the inheritance.

What is the proposition contrasting with the antecedent clause that is true in the actual world? Could the contrasting proposition be the simple (non-negated one) *that Clyde married X*, where X is somebody other than Bertha (presumably contextually salient). No, this would be wrong. We could utter (72b) if Clyde did marry Bertha in the actual world without committing ourselves to him having married both Bertha and X. Our utterance of (72b) does not indicate that it is true that Clyde married somebody other than Bertha at all. Suppose now (more plausibly) that the contrasting proposition is the negated one *that Clyde didn't marry X*, for some X other than Bertha. Once we add the silent *instead*, things can become tricky. The silent *instead* claims that of all the salient propositions of the form *that Clyde didn't marry X*, the only one true in the worlds being quantified over is *that Clyde didn't marry Bertha*. If there are several salient individuals he did not marry (plausible enough), this would lead us to conclude that in the worlds quantified over, he didn't marry Bertha, but he married a lot of other people (which doesn't match our intuitions about the meaning of (72b)). The general observation is that when there isn't a unique contrasting proposition, the consequences of the silent *instead* can be very implausible.[23]

4. 3 The matter of felicity: Ippolito (2003)

There is an epistemic flavour surrounding the contrast between (2) and (3), and Ippolito (2003) makes a proposal that tackles the epistemic issue head-on. Ippolito notes that differences between simple and perfect *would*-conditionals pertaining to the future tie in with differences in felicity conditions, and argues that the perfect is interpreted as a past tense that has the

[23] Ogihara 2006 makes *instead* optional.

role of shifting the felicity conditions of presuppositions of the antecedent to a past context set.[24]

I will begin by briefly describing key elements of Ippolito's proposal, that has both a semantic and pragmatic component (Ippolito presents a detailed and worked-out analysis, but for reasons of space, I won't fully present it here). My discussion will centre on the pragmatic aspect. Ippolito's examples of *would*-conditionals pertaining to the future are given below, together with some of her terminology:

(76) *Non-past conditional*
If Charlie took his Advanced Italian test tomorrow, he would pass.

(77) *Mismatched past counterfactual*
If Charlie had taken his Advanced Italian test tomorrow, he would have passed.

As we already noted in §3.5, the conditionals have different felicity conditions. If we knew that Charlie had passed away, we could felicitously utter (77), but not (76). According to the pragmatic component of Ippolito's analysis, the examples differ in that (76) requires that the existence+aliveness presuppositions of the proper name be compatible with the context set at the speech time, and (77) only requires that it be compatible with the context set in the (relevant) past. (76) is infelicitous in the context described because we currently know that Charlie is dead..

Ippolito's semantic proposal is based on the intuition that in conditionals like (74), the modal quantifies over worlds that are like the actual world up to some moment in the past and then diverge from the history of the actual world in a way that makes the antecedent clause true. Tense in the antecedent establishes the point of divergence. Technically, it functions as the temporal argument of an accessibility relation. In examples like (76), tense is present (the modal quantifies over worlds that are like the actual world up to the speech time) and in examples like (77), tense is past (the modal quantifies over worlds like the actual world up to the past time).

The semantic proposal itself does not predict the difference in felicity as described above, and Ippolito develops a pragmatic dimension, which builds on the following hypothesis:

(78) *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 2003: 165)

The felicity conditions for conditionals like (76) and (77) are spelled out below, where *P* is the proposition corresponding to the presuppositions of the

[24] In a very different framework (Veltman's information states semantics), Crouch (1993) explored the idea that the perfect in examples like (3) shifted the evaluation to a past information state.

antecedent, and, for any time *t*, c_t is the context set at *t* (t_c is the evaluation time):

(79) a. *Felicity conditions for non-past conditionals*
$P \cap c_{tc} \neq \varnothing$
b. *Felicity conditions for mis-matched past counterfactuals*
$P \cap c_t \neq \varnothing$, where $t < t_c$

Thus, (79a) claims that the presuppositions of the antecedent must be compatible with the context set at the evaluation time, and (79b) claims they must be compatible with the context set at an earlier time.

Ippolito's proposal is designed to give an account of the epistemic dimension of the contrast between (76) and (77). But, as Ippolito points out (footnote (41)), it is not difficult to construct examples in which the link between point of historical divergence (semantics) and context set (pragmatics) becomes strained. Here is Ippolito's example:

(80) If dinosaurs had been in New York next year, they would have felt really small.

Presumably, the worlds quantified over diverge from the history of the actual world at some time before dinosaurs became extinct, and develop into worlds in which dinosaurs are currently alive and in New York next year. But we wouldn't want to say that the felicity conditions of the utterance make reference to the context set in those days. It is unlikely that any conversation in which we could imagine an utterance of (80) would have an earlier stage during which dinosaurs were still alive. Noting this problem, Ippolito suggests that what is relevant in cases like this is not the information state at the point of divergence (before dinosaurs became extinct), but the information state the speaker believes she would have been in at that time (had she been alive). What (80) would require then is that the proposition *that dinosaurs be alive and in New York in 2007* be compatible with what we imagine would have been our context set at the relevant past time in which dinosaurs were still alive. However, it seems to me that this perspective won't really help. There is no guarantee that if we go back in time to a point at which dinosaurs were still alive (the relevant branching off point), we wouldn't know then that they would become extinct (sort of soon, long before 2007). Imagine that we are at the relevant branching-off time (*fork*), contemplating the dinosaurs in a plain, ignorant about whether they would be extinct in 2007 or not. And then somebody shows up with a time machine, takes us to the future and we find out (we see) that dinosaurs would become extinct. And then we go back to our original time, knowing that dinosaurs would soon be over. It seems to me that, even if our information state at the branching-off time were like this, it would still be felicitous (now) to utter (80), indicating that what matters in (80) is not really past knowledge. Granted, the scenario is rather far-fetched. But it makes the point that the connection between our temporal location and the things we know (or consider

possible) is not obviously so very strict, thus weakening Ippolito's suggestion about the dinosaurs.[25]

Ippolito's proposal that in examples like (77), the perfect shifts the time of the satisfaction conditions to the past time of the accessibility relation (the branching off time) faces other problems. Consider the examples below:

(81) #The robbery happened yesterday and nobody saw it happen. If the witness has seen the robbery tomorrow, she would have been able to see the thief's face (it's supposed to be a sunny day).

(82) #Neither George nor his brother, recently deceased, ever married, and Sara never actually believed that they had. If Sara had found out tomorrow that George got married, she would have been astonished.

The time of the accessibility relation will be the past (branching-off) time before the failed robbery or the failed finding out by Sara (the salient past time such that those events are possible in the future). Ippolito's pragmatic conditions require that the presuppositions of the antecedent be compatible with what we knew then. Take (81). If a robbery was compatible with what we knew then, a witness would plausibly be compatible too. But the sequence is odd. Knowing that there wasn't a witness, we are not happy to use a definite. But if what matters really is (just?) compatibility with past knowledge, why is it so hard? Notice that it is fairly easy to accommodate a witness once we know there has been a robbery:

(83) There was a robbery last night. If the witness had seen the thief's face, he would have been apprehended.

A similar problem arises with (82). The presuppositions of the antecedent sound odd in a context in which we know they are false. But if what matters is compatibility with a past information state, why is that?

Examples like these are only relatively problematic. Accommodation is subject to plausibility constraints of various kinds, and it might be that in contexts like the ones set up, having been so explicit about the falsehood of the presupposed proposition, it is just hard to turn around and immediately accommodate it (though, notice, in Ippolito's terms we would merely be talking about compatibility with the context set, which is weaker than the standard view on accommodation). However, examples like these do raise a question

[25] There is a concern that the example does not really address Ippolito's proposal (pointed out by a reviewer). Even if we found out in the past that dinosaurs would become extinct in the future, it would still be possible to imagine the context set before we found out, and evaluate the presuppositions of the antecedent with respect to the information available then. To test this properly, we would have to imagine information that was always available. Imagine, for example, that knowledge about the dinosaurs' extinction was hardwired into the earliest manifestations of mankind. Would that have made it impossible to felicitously utter a sentence like (80)? To the extent that it is possible to have judgments on this matter, it seems to me that (80) could have been felicitously uttered.

about what exactly it is that matters for the presuppositions of the antecedent, and we are left with the feeling that the constraint requiring that the presuppositions of the antecedent be compatible with the (relevant) past information state doesn't get us all the way. And it is unclear that it would be needed at all, if we had a more detailed picture of what is going on (see also footnote 17).

5. Conclusions

I have presented an analysis of simple and perfect *would*-conditionals that gives a unified LS-semantics to the modal and derives differences between the conditionals in terms of the interpretation of aspect. One of my goals has been to argue that the antecedent clauses in examples like (2)/(4) and (3) do not pick out the same proposition, and for this reason the modal has access to different sets of worlds. The main ingredients of the analysis have been the following: (i) aspect in simple eventive antecedents is perfective, (ii) perfective aspect introduces a deictic event pronoun, (iii) deictic event pronouns make reference to Lewis-events and introduce presuppositions. The emphasis in the paper has been to explain (2), (4) and (3). The treatment of stative antecedents, (5), has been admittedly preliminary. However, I hope that the main point (that they don't refer to events) will be plausible.

When discussing the interpretation of perfective antecedents in contexts in which we are not sure, we have made use of diagonalization to explain the interpretation of event pronouns that were not strictly speaking felicitous. By appealing to diagonalization to identify the antecedent clause proposition, we have also obtained an account of the epistemic effects observed with perfective antecedents in *would*-conditionals: given diagonalization, the modal will quantify over worlds in the context set in which an utterance of the antecedent would result in a true proposition.

I'll conclude the paper with two speculative comments. The first is related to the specific way in which the perfect makes reference to events. I have claimed that the perfect introduces a deictic event pronoun, but I have not considered alternative referential expressions. What about a hidden definite description over events? Or an E-type pronoun? Or an event demonstrative? It will take future work to systematically go over all these. Some of the remarks I have made here would apply regardless of the specific kind of referential expression that was involved. And other kinds of referential expressions bring with them their own issues. How would the world variable in a description be bound? How would event demonstration work? Etc. A general overview is lacking.

The other comments has to do with the relation between the referential analysis of perfective aspect I have proposed, and an alternative in which the role of perfective aspect would be to make *de re* claims about events. What is there to choose between the two proposals? I have chosen what I take to be the more cautious position, claiming that perfective aspect makes reference to

events without also deploying the framework of *de re* attributions. Discussion of *de re* attributions is usually found in contexts in which different acquaintance relations with the *res* matter, and more work would be needed to show a parallelism between those cases and the conditionals that have concerned me here. Moreover, I find cases like (2), in which there is no *res* with which we are acquainted, potentially more worrying for a *de re* analysis. It seems to me more plausible to think that in cases like this the speaker is acting as if reference works, than to say that the speaker is acting as if there is a *res* with which s/he has an acquaintance relation. The emphasis in the first case seems to be on the speaker's assumptions about the linguistic nature of the perfect (it's meaning or semantic type), whereas the second seems to involve more. But all this is very speculative, and a *de re* version of the analysis needs to be given more thought. Luckily, a *de re* analysis would also be referential, and if it was right, many of the things I have said here should remain reasonable.

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