

# Troubles at the Semantics/Syntax Interface: Some thoughts about the modal approach to conditionals\*

Katrin Schulz  
Dept. of Philosophy  
University of Amsterdam

`k.schulz@uva.nl`

## Abstract

Topic of the present paper is the modal approach to conditionals. We will distinguish two versions of the modal approach: a weak version which is the one that has been introduced by Kratzer (Kratzer [1977, 1979, 1981]) and a strong version that is the way the modal approach is presently used in many approaches to conditionals. In the second part of the paper we will present some arguments against the strong version of the modal approach. Aim of the paper is to stimulate a more critical and reflecting application of the modal approach.

## 1 Introduction

One of the most fundamental principles in the study of syntax and semantics of natural language is the principle of compositionality (Frege 1892; Partee 1984). This principle states that the meaning of a sentence directly follows from the meaning of its parts and the way they are combined. Applied to conditionals sentences, i.e. sentences of the form *If ..., then ...*, the principle of compositionality faces a number of very interesting challenges, concerning the interpretation of tense, aspect and modality (Comrie [1986], Crouch [1993], Fintel [2005], Iatridou [2000]). These problems have recently attracted a lot of attention among semanticists (Ippolito [2003, 2006], Kaufmann [2005], Schulz [2008], Stechow [2005], Stechow and Gronn. [2008]). Nearly all attempts made to answer these challenges build on a very popular interpretation principle for conditionals known as *the modal approach*. But people strongly differ in what they actually take the modal approach to be. This causes confusion in the discussion of the plausibility of the modal approach. The present paper attempts to clarify the landscape of modal approaches. In the first part I will argue that mainly two versions of the modal approach have to be distinguished: a weak version claiming that the *if*-clause of a conditional semantically

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functions as restrictor of one or more quantifiers, and a strong version claiming that the *if*-clause is at the level of Logical Form a direct argument of an obligatory quantifier in the consequent clause of the conditional. In the second part of the paper I will present a number of arguments against the strong version of the modal approach. The main message is that though not impossible, the strong modal approach is not plausible, because from the perspective of the syntax/semantics interface it postulates a worst case scenario: (i) it introduces semantically crucial material into the logical form that is not visible in the surface structure, and (ii) it does not interpret a substantial part of the material that is visible in the surface structure.

## 2 Compositionality and logical form

To start with let us first clarify some basic issues about the notion of logical form. The aim is to provide the fundament for distinguishing two variants of this notion. The distinction to be made is certainly not new and has probably been part of the reader's linguistic background knowledge since her first courses in linguistics. Nevertheless, it. The purpose here is rather to remind us of this distinction and apply it to the case of the modal approach.

The notion of logical form is closely related to the principle of compositionality. As said in the introduction, the principle of compositionality states that the meaning of a complex expression is determined by the meaning of its parts and the way they are combined. Ideally, a compositional theory of meaning for some (sub-) would thus consist of a lexicon that annotates every primitive expression of  $L$  with its syntactic information and semantic value, a set of syntactic rules for how to combine simple expressions to complex expression, and a semantic annotation of these rules that tells us how the meaning of the simple expression has to be combined to the meaning of the complex expression. It is widely accepted among semanticists that compositionality cannot apply to the surface structure (SS) of sentences directly, but rather applies to an underlying representation. Still, requirements like learnability demand a systematic correspondence between what is expressed in the SS of a sentence and what can be assumed to be present at the level of LF. Consequently, the picture that emerges for the compositional theory looks rather as given in figure 1. Some natural language expression  $e$  is in a systematic, computable way that is described by the grammar of the language related to an expression  $e^*$  that is called the Logical Form of the expression  $e$ . This Logical Form is then fed into the compositional semantics of the language, consisting of a semantically annotated lexicon and grammar for  $e^*$  expressions. This compositional semantics produces as meaning of  $e^*$  the meaning we observe for  $e$ . We will call the notion of Logical Form that emerges from this picture *LF1*, in order to distinguish it from a second notion *LF2*.

The essential difference between LF1 and LF2 that in case of LF 2 there does not have to be in a systematic grammatical relation between a natural language expression and its LF2  $e^+$ .  $e^+$  is just an expression in some formal language that is supposed to clarify the logical structure of the meaning of  $e$ . The relation between the two expression

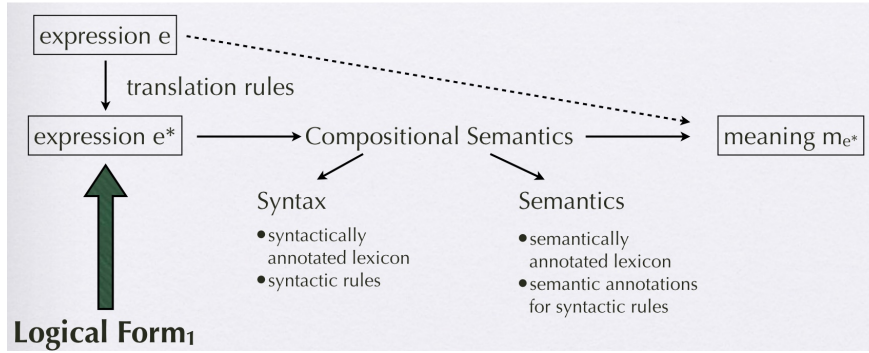


Figure 1: A compositional theory of meaning

essentially comes down to the following two points: (i)  $e^+$  contains the primitive parts of  $e$  (according to some level of primitivity), and (ii) the meaning  $m_{e^+}$  assigned to  $e^+$  identical to the meaning observed for  $e$ . This means that, strictly speaking, an LF2 theory does not provide a compositional semantics for  $e$ , but only for  $e^+$ . As far as  $e$  is concerned, the theory only gives a general description for how the meaning of  $e$  depends on the meaning of its parts. It is possible that the way the meaning is computed for  $e^+$  is totally out of question for  $e$  given its syntax.

To illustrate the distinction between LF1 and LF2 we can use a well-known example from the literature. In (1-b) and (1-c) two expressions in different formal languages (*First Order Logic* (FOL) and the language of *Generalized Quantifiers* L(GQ)) are given that both predict the same overall meaning for the English sentence (1-a) as function of the meanings of its parts.<sup>1</sup>

- (1) a. All linguists are bad mathematicians.  
 b.  $\forall x(Linguist(x) \rightarrow BadMathematician(x))$   
 c.  $ALL(Linguist) BadMathematicians$

Though there was a time when people took (1-b) to represent the logical of (1-a), it is certainly not an LF1. The reason is that there is no general and systematic relation between English expressions of the form (1-a) and the FOL expression (1-b). Already changing in (1-a) *all* into *some* will mean that one has to use a completely different FOL expression to describe the meaning of the resulting sentence correctly. Other quantificational expressions like *most* completely miss a FOL translation. The expression in (1-c) is much more convincing as LF1, in this case a systematic relation to the form of English sentences exists.

In formal semantics we find both notions of LF applied, giving rise to two different types of semantic theories: LF1 theories and LF2 theories. Actually, the weaker LF2-type theories dominates the field. This is not very surprising, because in an LF2

<sup>1</sup>To simplify matters we assume that the atomic parts of the complex expression (1-a) are *Linguist*, *BadMathematician* and *All*.

theory semanticists only have to worry about the syntax of  $e^*$  expressions. These are normally expressions of some formal language for which a fully specified syntax is at hand. Of course, there is nothing wrong with a LF2 theory. It is a weaker type of a theory of meaning because it does semantics without syntax. But it still can clarify important points about lexical semantics and functional dependencies within the meaning of complex expressions. However, one can observe a tendency in compositional approaches to meaning to take successful LF2 theories as providing a description of the LF1 of natural language expressions. Though this can be an interesting working hypothesis it is a hypothesis with a weak foundation. As the example above shows LF2s are not uniquely defined. So the fact that you found some formula computing based on the atomic expressions the meaning of the complex does not imply that you have found a representation of the LF1 of the expression. Therefore, the step from an LF2 theory to an LF1 theory has to be done with care and should be accompanied with serious investments into providing a syntactic basis for this step.

In the next section we will argue that such a step from a LF2 theory to an LF1 theory has been taken in case of the modal approach and that in this case the step misses a sound foundation. We will base this conclusion on semantic arguments.

### 3 The modal approach

#### 3.1 The original modal approach

The modal approach originated in the work Angelika Kratzer (Kratzer77, Kratzer79, Kratzer81a, Kratzer81b, Kratzer91b) and was inspired by an article by David Lewis (Lewis [1975]). Both, Kratzer and Lewis, observe that *if*-clauses in combination with quantifiers, i.e. structures like (2-a) and (2-b) below, obtain an interpretation according to which the antecedent of the conditional restricts the quantifier and the consequence forms the nucleus of the quantifier. Lewis makes this observation for adverbs of quantification and Kratzer mainly for modal quantifiers. In Fintel and Iatridou [2002] you find the same point illustrated for individual determiners.

- (2) a. [Quantifier] [if p] [q]  
           *Always if Peter goes to the pub, he comes home drunk.*  
       b. [if p] [Quantifier] [q]  
           *If Peter comes home drunk, probably he went to the pub.*

At this point, this is only an observation concerning functional dependencies within the meaning of complex expressions like (2-a) and (2-b). In a next step they consider the question of how to derive this meaning compositionally from the construction. How do quantifier and conditional combine in order to produce this overall meaning? They observe that neither (3-a) nor (3-b) give the intuitive correct results if one analyses  $>$  as material implication. Thus, analyzing conditionals as material implication will not do the job.

- (3)    a.  $p > (\textit{Quantifier } q)$   
          b.  $\textit{Quantifier}(p > q)$

Lewis (1975) goes further and argues that there is no way to interpret  $>$  in a uniform manner such that (3-b) produces the correct meaning.<sup>2</sup> Lewis concludes "... that the *if* of our restrictive *if*-clauses should not be regarded as a sentential connective. It has no meaning apart from the adverb it restricts. ... It serves merely to mark an argument-place in a polyadic construction." [Lewis 1998, p.14] One might want to complain at this point: considering only binary truth-functions as meaning for  $>$  is too restricted. But we also have the result of Gibbard showing that any conditional operator  $p \Rightarrow$  satisfying the following three principles reduces to material implication, and for material implication we already know that it works neither for (3-a) nor for (3-b) (Gibbard [1981]).

1.  $p \Rightarrow (q \Rightarrow r)$  and  $(p \wedge q) \Rightarrow r$  are logically equivalent.
2.  $p \Rightarrow q$  implies the corresponding material conditional, that is,  $p \Rightarrow q$  is false whenever  $p$  is true and  $q$  is false.
3. If  $p$  logically implies  $q$ , then  $p \Rightarrow q$  is a logical truth.

The conclusion Kratzer derives is that there is no such thing as a conditional construction: "The history of the conditional is the story of a syntactic mistake. There is no two-place *if ... then* connective in the logical forms of natural language. *If*-clauses are devices for restricting the domains of various operators." [Kratzer [1991]]. Notice the cross-linguistic nature of this claim. The alternative analysis Kratzer consequently proposes consists essentially of two claims.

1. An *if*-clause semantically functions as restrictor of one or more quantifiers.
2. If there is an *if*-clause, then there is also a quantifier in the main clause. Bare conditionals contain covert quantifiers.

Notice that the first claim is essentially an LF2-theory claim. It says something about the semantic function of the *if*-clause within the sentence, but does not explain how this function comes about. The second claim is a LF1-type claim: it puts restrictions on the LF1 form of conditional sentences: there has to be a quantifier in the LF1 of the main clause. Kratzer is aware of the status of the claims she makes. She openly admits that at this point the problem of a compositional account for the meaning of conditional sentences is not yet solved: "If we are serious about the syntax/semantics interface, our job is not done, however. We still have to show how plausible syntactic structures can provide the right input for a semantic interpretation component that derives truth conditions for conditionals in a fully compositional and general way for all cases where *if*-clauses restrict operators of any kind." [Kratzer 2009, ch. 4, p. 12].

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<sup>2</sup>Though he is not explicit on this point, I take him to mean no interpretation of  $>$  as binary truth-function on  $p$  and  $q$ .

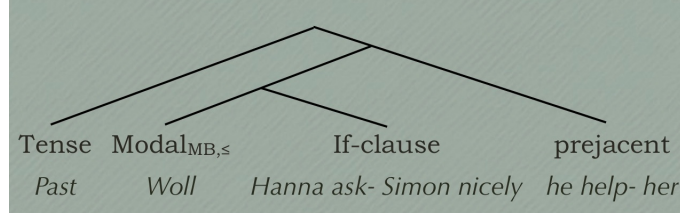


Figure 2: The LF1 according to the strong modal approach for English

In particular, according to her there is no need to take the *if*-clause to be also on the level of Logical Form (LF1) an argument of the quantificational operator. Kratzer even cites argument against such an analysis. As possible alternative, she proposes as LF1 of conditionals  $(If \dots)(modal \dots)$  and as interpretation principle for conditionals the following rule.

*Conditional modality*

For any conversational backgrounds  $f$  and  $g$

$$\llbracket If \alpha \beta \rrbracket^{f,g} = \llbracket \beta \rrbracket^{f^*,g}, \text{ where for all } w \in W, f^*(w) = f(w) \cup \llbracket \alpha \rrbracket^{f,g}.$$

Before concluding this section on the original form of the modal approach, let me stress the point that the main argument in favor of the modal approach that has been given in the discussion is negative: we can't make things work with a conditional connective. This does, of course, not necessarily mean that we have to assume the modal approach instead. There are not many positive arguments for the approach given. In favor of the first claim we can say that it correctly describes the overall meaning of conditional sentences with quantifiers. This means that it is a correct LF2 analysis. For the second claim Kratzer gives essentially one argument: bare conditionals show the same context dependence as do sentences with overt modals Kratzer (2009, ch. 4, p. 23).

### 3.2 Stronger versions of the modal approach

The modal approach has gained an enormous popularity during the last 30 years. This popularity is well motivated by its elegance, flexibility and simplicity. The approach also relates well to the extensive body of philosophical literature on conditionals.

In recent applications of the modal approach a number of assumptions have been added to the two claims of Kratzer's original proposal. Most importantly, one can often find interpretations of the modal approach according to which the first claim is strengthened from an LF2 claim to a claim about the LF1 of conditional sentences. In other words, it is assumed that the *if*-clause is at the level of LF1 a direct argument of a quantifier in the consequent.

This stronger approach is often used as starting point to approach the interpretation of tense, mood, and aspect in conditionals of different languages. The LF1 of the

English conditional (4) can then be proposed to look like given in figure 2 (see Ippolito [2003, 2006] and for a very similar line of approach Stechow [2005], Stechow and Gronn. [2008]). In this case it is assumed that the modal *WOLL* in English conditionals realizes the quantifier that according to the modal approach takes the *if*-clause as argument. This is combined with a standard analysis of the modal, according to which it does not only quantify over possible worlds, but also binds the evaluation time of its arguments. The tense- (and aspect-) morphology marked on the modal is interpreted on top of the modal and determines the evaluation time of the modal. This approach works very well for the VP governed by the modal expression *would*, because the latter does not contain any inflectional material on its own. But the verb of the antecedent is fully inflected. The general strategy adopted to deal with this problems is to claim that the markings are semantically void (sequence of tense, agreement). Another problem is that because the theory inserts the antecedent directly as argument of the modal, there is no semantic function left for *if* and *then*. In consequence, they are also claimed to be semantically void.

- (4) If Hanna asked Simon nicely, he would help her.

The list below summarizes the main claims of the strong interpretation of the modal approach. The order follows roughly the motivational links between the different claims. Thus, a claim A that motivated the introduction of a claim B will show up higher in the order than the claim B. This also has the effect that the claims lower in the order are those that are more specific or stronger.

1. *WOLL* in the main clause of English conditionals is the obligatory modal quantifier that according to the weak modal approach is restricted by the *if*-clause of the conditional.
2. Bare conditionals are implicitly modalized.
3. The LF1 of conditionals is:  $MODAL[g(f(\text{if-clause } IP))][\text{main-clause } VP]$ , where  $g$  describes the contextually given ordering source and  $f$  the contextually given modal base.
4. *WOLL* binds the temporal and modal perspective of the *if*-clause.
5. The (tense) morphology in the *if*-clause is semantically void (sequence-of-tense, agreement).
6. *If* (and *then*) in conditionals is semantically void.

It has to be stressed that not all applications made of the modal approach clearly fall in one the the two groups of modal approaches distinguished here, weak modal approach (claim 1 of Kratzer) or strong modal approach (claim 1 to 6 in the list above). There are also intermediate approaches that embrace some of the claims of the strong modal approach, but not all of them (see, for instance, Alonso-Ovalle [2009]). For the discussion at hand this is of no relevance.

## 4 Evaluating the modal approach

The present section presents some arguments against the strong modal approach. Most of the arguments are not new. It is also not the aim of this section to completely refute the modal approach. The goal is rather to argue that the strong modal approach is not plausible, because it involves very costly assumptions about the syntax/semantics interface. These costs do not show at first sight, because the strong modal approach is normally only applied to one particular language (English), and within this language one particular subclass of conditionals (subjunctive conditionals). Therefore the main strategy in the argumentation below will be to take a more general perspective and show that then the assumptions made by the strong modal approach are not convincing. In the following we will address each of the claims of the strong modal approach (see the list given in section 3.2) separately, starting at the bottom of the list.

### 4.1 Claim 6: *If* (and *then*) in conditionals is semantically void.

The sixth claim of the strong modal approach is that the expressions *if* and *then* in English conditionals are semantically void. It is an assumption easily made given claim 3, because if one assumes that the *if*-clause is a direct argument of the modal on the level of LF1, then one wants to have there just the proposition denoted by the antecedent. There is nothing left for *if* to do.

Of course, this is not the first time an element of the surface structure is claimed to have no semantic function. The problem for the specific case at hand is that the claim extends to lack of syntactic function as well.<sup>3</sup> This idea is not convincing for it had to translate to a large group of languages that all use similar elements in the construction of their conditionals. Furthermore, *If* is a stable element of English conditionals since hundred of years. Why should a construction with a completely superfluous element be so stable across time and across languages? With regard to the second possibility, I'm not aware of any approach where *if* has no semantic, but does have a syntactic function.

Another problem with such a position is that it makes it very hard to explain why in English there is a whole class of sentences with apparently the same syntactic structure (adverbial clauses) only varying with respect to the element in the position of *if* but with clearly different meaning (see the examples in (5)).

- (5)
  - a. If Mary has left the building, we are in great danger.
  - b. Because Mary has left the building, we are in great danger.
  - c. When Mary has left the building, we are in great danger.
  - d. Though Mary has left the building, we are in great danger.

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<sup>3</sup>If one assumes that *if* nevertheless has a syntactic function, one could propose that it marks the presents of covert semantic material at a different position in the tree. For instance, one could propose that *if* marks the presence of a modal operator higher up in the tree, though I do not have any references for this position.



Of course, one could propose that *If* is the element that is semantically void, while the other elements still make a semantic contribution. But that would probably mean that one would have to propose a completely different semantics for these otherwise completely identical constructions. Thus, we conclude that claim 6 should not be part of a semantic theory of conditional sentences.

#### 4.2 Claim 5: The (tense) morphology in the *if*-clause is semantically void

Lets turn to the fifth claim in the list, stating that the tense morphology in the *if*-clause is semantically void. The motivation for claim 5 is similar to that of claim 6. The inflectional markers on the modal in the consequent is taken to be interpreted on top of the modal. The modal is assumed, in turn, to pass by claim 4 this information (i.e. the evaluation time) to its arguments. That leaves basically nothing for the morphological material (tense) on the verb in the antecedent to do. This makes it very natural to assume that the antecedent just copies the markings from the main verb (sequence of tense, agreement).

The claim is in Ippolito [2003, 2006], Stechow and Gronn. [2008] made for English subjunctive conditionals. In this case it looks very convenient, because the inflectional markings on the verb in antecedent and consequent are arguably both Past Tense markers and the Past Tense morphology appears to have no effect (at least temporally). But notice that SOT is normally used to explain the existence of an additional reading that ignores the embedded Past Tense morphology. In the case of subjunctive conditionals there is no 'normal' reading that does interpret the Past Tense in the antecedent. Furthermore, there are (i) languages with normal functioning tense in antecedent and consequent of subjunctive conditionals, and (ii) languages marking their subjunctive or counterfactual conditional using a 'non-functional' past tense only in the antecedent. A theory that adopts claim 5 would not extend to these languages. For English, the problem is that the approach does not extend to indicative conditionals. In the antecedent of indicative conditionals the tense morphology cannot always be vacuous due to SOT, for one thing, because the main tense does not have to be past (see (6-a)), and secondly, even in case the tense of the main clause is Simple Past, the antecedent does not have to be marked for the Past Tense as well (see (6-b)). In fact, the tense in the antecedent of indicative conditionals appears to function pretty normal: it just localizes the eventuality described by the antecedent in the expected way relative to some temporal anchor point.<sup>4</sup> So, any compositional account of the semantics of indicative conditionals has to allow for tense in the antecedent to be functional.

- (6) a. If Peter found your letter, he will kill the postman.

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<sup>4</sup>A well-known particularity of the temporal interpretation of the antecedent of English conditionals is that the Present Tense freely allows for future interpretations relative to the utterance time. In contrast, future reference for the Simple Present of simple sentences is very restricted. Kaufmann [2005] and Schulz [2008] propose that the Simple Present in English in general allows for future reference, but that in normal sentences this possibility cannot be realized for conceptual reasons. If one adopts such an approach one can even claim that the tense in *if*-clauses is interpreted exactly as in plain sentences.

- b. If Peter comes out smiling, the interview went well.

The reaction of approaches that embrace claim 5 probably will be that they really only want it to apply to subjunctive conditionals and that indicative conditionals just function differently. First, one has to say that the semantics of indicative and subjunctive conditionals is not that different. Examples like the classical Kennedy example from Adams do not prove that there is a fundamental difference between both types of conditionals. It is easy to find similar pairs of subjunctive and indicative conditionals that do not differ substantially in meaning, see (7).

- (7) a. If yesterday there was a lot of rain up in the mountains, we will have a flood down here by tomorrow.
- b. If yesterday there had been a lot of rain up in the mountains, we would have had a flood down here by tomorrow.

A difference between indicative and subjunctive conditionals that would help an claim 5 approach does not have to be that fundamental, but it has to allow tense a normal interpretation in the *if*-clause of indicative clauses, while it completely excludes the same possibility for subjunctive conditionals. The question is how realistic such an approach is.

To summarize, claim 5 cannot hold for conditionals in general: SOT or agreement cannot in general explain away the morphological material on the verb in *if*-clauses. Any account of the meaning of English conditionals has to allow for interpretation of this material at least in indicative conditionals. Secondly, an SOT account for tense in subjunctive conditionals has to explain why an interpretation of the morphological material is completely impossible.

### 4.3 Claim 4: Woll binds the temporal and modal perspective of the *if*-clause.

The idea that modals like *WOLL* bind not only the modal parameter but also the evaluation time of their arguments has a long history in formal semantics. This assumption (that intensional operators bind the evaluation time of eventualities in their scope) has been proposed already by Montague and has been argued for at many occasions since then (see Abusch [1997], Condoravdi [2002]). These approaches agree that in order to get the temporal references right one has to assume the presence of a non-past operator (NPO) on top of the VP meaning in scope of the modal. This operator introduces the possibility for the eventuality described by the VP to take place at or in the future of the evaluation time of the modal.<sup>5</sup>

An additional complication for the case of conditionals is that now also the temporal interpretation of the antecedent has to be fixed relative to the evaluation time of the

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<sup>5</sup>This operation has been analyzed to be part of the semantic contribution of the modal (see Condoravdi [2002]) or to be an independent (tense-) operation at the level of Logical Form (Stechow [2005]). For arguments against an analysis as tense see Condoravdi [2002].

modal. If one assumes with claim 3 of the strong modal approach that the antecedent is an LF1-argument of the modal, then claim 4 follows: WOLL binds the temporal and modal perspective of the *if*-clause. At this point one has to decide on how to interpret the tenses in the antecedent relative to the evaluation time of the modal. In approaches like Ippolito [2003, 2006], Stechow and Gronn. [2008] that embrace claim 5 for subjunctive conditionals, the authors assume an additional non-past operator on top of the semantically tense-less antecedent clause. For a sentence like (4) we obtain then the schematic meaning described in (8-a), and paraphrased in (8-b) (we additionally assume that the tense marked on the modal refers to the utterance time).

(4) If Hanna asked Simon nicely, he would help her.

- (8) a.  $\forall w' [w' \in Sim_{w_0}(\lambda w'. w' \in MB_{(w_0, t)} \wedge \exists t' \geq t_0 \llbracket if - clause \rrbracket(w')(t')) \rightarrow \exists t'' \geq t_0 \llbracket VP main - clause \rrbracket(w')(t'')]$   
 b. *For all worlds that are (i) in the relevant modal base evaluated at the utterance time  $t_0$  in the evaluation world, (ii) make the antecedent true at some time at or in the future of  $t_0$ , and (ii) are maximally similar to the evaluation world holds that they also make the main clause VP true at some time in the future of  $t_0$ .*

Given that at least in English indicative conditionals the tense marked in the *if*-clause appears to be interpreted in situ, we have to allow for this possibility in our semantic theory. According to claim 4 the tense in the antecedent should get a relative interpretation, relative to the evaluation time of the modal. Such an analysis would predict the following observations:

1. The tense marked on the modal is interpreted absolutely (relative to the utterance time).
2. The tense in the antecedent is interpreted relative to the evaluation time of the modal.
3. The temporal location of the eventuality denoted by the VP of the consequent is located relative to the evaluation time of the modal (at or in its future) but independent from the temporal location of the eventuality denoted by the VP of the antecedent.

Some support for the prediction described in 2 seems to come from observations concerning the interpretation of the Simple Present in the antecedent of conditionals (see footnote 4). But certainly prediction 3 and arguably also prediction 1 are problematic. Contra to what is predicted by a strong modal approach, we observe that the interpretation of tense marked in the consequent of English indicative conditionals depends on the temporal location of the eventuality described in the antecedent. Lets have a look, for instance, at example ((9-a)). This sentence has a reading according to which the interview mentioned takes place before John leaves smiling, but still in the future of the utterance time. Thus, apparently, the Simple Past in the consequent is not anchored in the utterance time, but in the time denoted by the tense of the

antecedent: the time of John's leaving.<sup>6</sup>

- (9) a. If John comes out smiling, the interview went well.

The observation extends to the Simple Present. In its generic reading, example ((10-a)) cannot have an interpretation according to which the rising of the temperature takes place before the bending of the strip. One might argue that the alternative reading is excluded by world knowledge. But this reading is admissible if we express the same conditional relation as fact about the past ((10-b)).

- (10) a. If the strip bends, the temperature rises.  
b. If the strip bent, the temperature rose.

So far, we have only discussed examples without modal verb in the consequent. But the observation can be made for explicitly modalized conditionals as well. This is somewhat less easy to observe, because, as discussed in more details below, the shift of the anchor to the denotation time in the antecedent is not obligatory. It is only obligatory given a particular reading of the conditional, or to use the terminology of Kratzer [1979, 1981], given the choice of the modal base. Consider, for instance, the conditionals in (5), reading the dependency between antecedent and consequent as causal dependence (he passed the examen because he practiced the night before). With this reading variant ((11-a)), without perfect, is marked and ((11-b)) should be used. The use of the perfect is necessary because the anchor for the temporal interpretation of the modal phrase is shifted to the future denotation time of the Simple Present in the antecedent.

- (11) a. If tomorrow he passes the examen, he will practice all night.  
b. If tomorrow he passes the examen, he will have practiced all night.

The same optional shift of the anchor can be observed with subjunctive conditionals.<sup>7</sup> Translating the indicative example ((9-a)) into the subjunctive, the perfect-free variant ((12-a)) is out and ((12-b)) has to be used. Again, the fact that you have to use the perfect shows that the evaluation time of the modal is shifted to the future denotation time of the Simple Present in the antecedent. The perfect is necessary to access a time in the future of the utterance time and in the past of the denotation time of the tense in the antecedent.

- (12) a. ??If John came out smiling, the interview would go well.  
b. If John came out smiling, the interview would have gone well.

We conclude that claim 4 results in the wrong scopal dependencies for the interpretation of tenses in conditionals.

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<sup>6</sup>Notice that this is not a sequence of tense phenomenon. The Simple Past in the consequent is not semantically void, but still expresses pastness.

<sup>7</sup>To my knowledge this has not been observed before.

#### 4.4 Claim 3: The LF1 of conditionals

The next claim we will address is the assumption that the logical form (LF2) of conditionals as proposed by the weak modal approach is an LF1, in particular, that the *if*-clause is on the level of Logical Form an argument of the obligatory modal in the consequent clause of the conditional. Semantically, this claim is not easily criticized, for the distinction between LF2 and LF1 is mainly one concerning form and not meaning. Therefore, arguments against this position are most easily found in syntax rather than semantics.

However, this paper is not concerned with syntactic, but with semantic argumentation. Potential semantic arguments against claim 3 have to concern semantic dependencies between the involved operators. In fact, Angelika Kratzer herself argues against the assumption that the modal approach concerns an LF 1 representation and presents an argument concerning modal dependencies. Her argument is based on the observation is that one and the same antecedent can serve to restrict a number of independent modal expressions in independent sentences (four subsequent modals in example (13)). This kind of data, concerning modal subordination, rather points to an analysis that takes the *if*-clause of conditionals to modify global parameters of interpretation that can freely be accessed from modals in discourse.

- (13) If a wolf entered the house, he must have eaten grandma, since she was bedridden. He might have eaten the girl with the red cap, too. In fact, thats rather likely. The poor little thing wouldnt have been able to defend herself. (Kratzer, ch. 4, p. 13)

Another argument following the same line can be found in Fintel and Iatridou [2002]. This paper discusses the application of the modal approach in case the *if*-clause appears in the context of nominal quantifiers. Against an analysis that takes the *if*-clause to be an argument of the quantifier they mention the observation that the existential presupposition that nominal quantifiers often carry does not extend to the *if*-clause (see (14), cited from Fintel and Iatridou [2002]).

- (14) a. Many /A few of the students will succeed if they work hard.  
b. Many/A few of the students who work hard will succeed.

The semantic argument added by the present paper is the observation from subsection 4.3 against claim 4. Claim 4 is a consequence of claim 3: if you assume that the antecedent is a syntactic argument of the modal then the independently motivated assumption that modals (as intensional operators) bind the evaluation time in their scope leads to the acceptance of claim 4. Hence, the scoping problems concerning the interpretation of tense that we have discussed in subsection 4.3 attack claim 3 together with claim 4.

#### 4.5 Claim 2: Bare conditionals are implicitly modalized.

Claim 2 is the only LF 1-theory claim made by Angelika Kratzer herself. To account for conditional sentences that contain no quantificational elements she proposes that in these cases the quantifier is covert. Furthermore, she suggests that the question which types of bare conditionals a particular language distinguishes depends on the inventory of covert operators of that language. For instance, English has according to Kratzer [2009] covert generic and epistemic universal quantifiers that result in two types of bare conditionals. The situation might be different in other languages.

How convincing this claim is depends a lot on the kind of independent evidence that can be brought forward for the existence of covert modals in a particular language. A covert modal that only exists in the context of bare conditionals would not be very convincing. It has often (and independently from the issue of conditionals) been argued that English has covert generic operators, but the claim about covert epistemic operators is much less supported.

Cross-linguistically, it is conspicuous that there appears to be no substantial variation in the meaning of bare conditionals. I am not aware of any language that has a covert possibility modal in conditional or any covert operator with a quantificational force different from the universal force.<sup>8</sup> Also the type of modal base that has to be assumed as underlying the bare conditional reading appears to be considerably fixed to circumstantial/metaphysical or epistemic readings and generic readings. There has to be some cross-linguistic explanation for these restrictions. Without such an explanation, it appears much more convincing to look for an approach that does without covert elements that are in principle extremely flexible in their potential meaning.

Furthermore, one has to be careful with the type of covert element that is postulated here. In the spectrum of claims made about the existence of covert elements that have been proposed claim 2 is particularly strong. The difference with more standard covert elements like (negative) concord, pro-drop or e-pronouns is that claim 2 concerns a covert element that leaves no surface traces at all. It is not copying some meaning that is already expressed at some other place (as in the case of e-pronouns) or spelled out at some distance as is often claimed for inflection markers like tense and mood on verbs. There is simply nothing. This type of covert material puts rather heavy loads on the shoulders of the language learner or interpreter that has to detect them in the right places. Particularly simple sentences are problematic in this respect. Given that modal base and ordering source are supposed to be provided by the context, any bare sentence could in principle contain one or more covert modals of the relevant kind.

Given these conceptual problems a recourse to the kind of overt elements proposed by claim 2 should be a last resort, in case nothing else goes. But this means that we first should seriously try to do without claim 2.

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<sup>8</sup>It has been argued that generic operators are not truly universal, because they allow for exceptions. This might weaken my point here.

#### 4.6 Claim 1: Woll as the modal of the modal approach.

Claim 1 is the weakest of all the claim in the list we have discussed. It is furthermore completely independent from the other claims. An example for an approach that embraces claim 1 but is at least neutral with respect to al other claims might be Alonso-Ovalle [2009]. In particular, he does not assume that the antecedent is at the level of Logical Form an argument of the modal WOLL (claim 3) and he does assign as semantic function to *If* (claim 6). There is nothing substantial that I can put forward against this claim. The only problem I see is that by assuming claim 1 while dropping claim 2 gives an inhomogeneous semantics for conditionals. If we have to do without modals for bare conditionals, it looks much stronger if the semantics of bare conditionals would also apply to conditionals involving over quantificational elements.

In sum, we will not refute claim 1 in principle, but just note that dropping claim 1 together with the claims 2 to 6 will result in a more homogenous semantic theory.

## 5 Conclusions

What we hoped to achieve with the discussion in section 4 is not so much a refutation of the strong modal approach. Rather, the conclusion should be that this approach is not very plausible, because from the perspective of the syntax/semantics it assumes a worst case scenario for the semantics of conditionals: (i) it introduces material that is crucial for the semantics of conditionals (the modal) that is sometimes not visible at all in the surface structure, and (ii) it does not interpret a substantial part of the material (*if* and *then*) that is visible in the surface structure. Furthermore, as argued in section 4.4, the Logical Form of conditionals assumed by the strong approach leads to a number of problems concerning the scoping of semantic operators. There might be repair strategies for these problems, but they still have to be worked out.

This together should provide sufficient reason to motivate a general shift in attention towards alternatives to the strong modal approach. If the present paper has convinced the reader of this central point, then the paper has achieved all it was meant to do. Hopefully, we will see in the future more work done in this direction and generally a more critical stance towards the strong modal approach.

For many reasons experience is good in research; experience makes you a better researcher. But there is also a draw back: the more experienced you are, the more you tend to stick to the tools that have proven themselves in the past and the more difficult it becomes to approach something with a clean conscious. This does not only apply to a single individual, but also to a group of scientists as a whole. I think that's what we need in the case of conditionals: a fresh look on the data, free from an European bias. Maybe, then we can find a solution to the problems discussed in the present paper.

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