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Counterfactuality in Discourse

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by

Jos Leonard Tellings

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## ABSTRACT OF THE DISSERTATION

Counterfactuality in Discourse

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Jos Leonard Tellings

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Professor Jessica L. Rett, Co-Chair

Professor Yael Sharvit, Co-Chair

This dissertation studies counterfactual conditionals in English. Counterfactual conditionals typically come with inferences that their antecedent and their consequent are not true in the actual world (written  $CF_p$  and  $CF_q$ , respectively).

(i) If John had taken the bus, he would have been on time.

↪  $CF_p$ : John did not take the bus

↪  $CF_q$ : John was not on time

Focusing on  $CF_q$ , the dissertation answers the question of what contextual conditions must be met for  $CF_q$  to arise, by looking at cases in which the inference gets *cancelled*. I show that  $CF_q$  can be cancelled in a number of different contexts:

- in some but not all conditionals that have the words ‘also’ or ‘still’ in their consequent;
- in a set of conditionals when uttered with a specific intonation contour.

Empirically, I show that when ‘also’ focus-associates with material in the antecedent, it cancels  $CF_q$ , but when it associates with material in the consequent it does not. This difference in focus association is reflected in the prosodic properties of the particle ‘also’ in the conditional.

The first step of the analysis is to find a property that unites the different  $CF_q$ -cancellation contexts. I argue that what they have in common is their making salient more than one cause for the same consequent (a *multiple cause context*). In the case of ‘also’, association with focus determines where focus alternatives are generated, which in turn determines whether a single or multiple causes are made salient.

The second step of the analysis is to show that *conditional perfection* (strengthening conditionals to biconditionals) is a necessary ingredient for the  $CF_q$  inference to arise, an idea sketched by Karttunen (1971). The crucial prediction is that in contexts in which no conditional perfection occurs,  $CF_q$  is not generated either.

Finally, I show that multiple cause contexts do not trigger conditional perfection, which in view of the above-mentioned prediction completes the analysis. Moreover, because conditional perfection has been analyzed in terms of discourse structure and exhaustive answers, we obtain a new set of theoretical tools to study counterfactuality as a discourse phenomenon.

The dissertation of Jos Leonard Tellings is approved.

Gabriel Jae Greenberg

Jesse Aron Harris

Jessica L. Rett, Committee Co-Chair

Yael Sharvit, Committee Co-Chair

University of California, Los Angeles

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## VITA

### *Education*

2008	Bachelor of Science	Mathematics	Utrecht University
2008	Bachelor of Arts	Linguistics	Utrecht University
2009	Master of Science	Mathematics and the Foundations of Computer Science	University of Oxford
2010	Master of Philosophy	Linguistics	University of Cambridge
2013	Master of Arts	Linguistics	UCLA

### *Employment*

2012 – 2016	various teaching assistantships, UCLA Department of Linguistics
2015 – 2016	research assistant, UCLA Department of Mathematics
2014	instructor “Introduction to Linguistics”, UCLA Summer School
2006 – 2007	undergraduate teaching assistant, Utrecht University Department of Mathematics

### *Awards / fellowships*

2015	UCLA Dissertation Year Fellowship
2011	UCLA Humanities Dean’s Fellowship
2009	Honorary Cambridge European Trust Scholar
2008, 2009	Huygens Scholarship Programme (Dutch government)

### *Publications*

- Barchas-Lichtenstein, J., Martin, C., Munro, P., and **Tellings, J.** (to appear). ‘Quantification

in Imbabura Quichua’. In E. Keenan and D. Paperno (eds.) *Handbook of Quantifiers in Natural Language – Vol. 2*. Springer.

- **Tellings, J.** (2015). ‘On the focus-sensitivity of counterfactuality’. In T. Brochhagen, F. Roelofsen and N. Theiler (eds.) *Proceedings of the 20th Amsterdam Colloquium*, pp. 388–397.
- **Tellings, J.** (2015). ‘Expressing identity in Imbabura Quichua’. In J. Pasquereau (ed.) *Proceedings of SULA 8*, pp. 89–104.
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*ha én ablak volnék, akkora nagy lennék  
hogy az egész világ láthatóvá váljék  
megértő szemekkel átnéznének rajtam  
akkor lennék boldog ha mindent megmutattam*

(from “Ha én rózsza volnék”, Bródy J.)

if I were a window I would be so large / that the entire world would become visible / with understanding views they would look through me / I would be happy if everything became clear

# 1 Introduction

## 1.0 Preview

I will start by giving a preview of what this dissertation is about by presenting some of the key data and the essence of the analysis. This preview uses some terminology without proper introduction or definition, but this should not impede the informed reader as all of it follows standard use in the literature.

Counterfactual conditionals as in (1) typically carry two counterfactual inferences: one inference that the antecedent is contrary to fact (John did not take the bus), and one inference that the consequent is contrary to fact (he was not on time). As a conditional is typically denoted ‘ $p \rightarrow q$ ’, I will write these inferences as  $\mathbf{CF}_p$  and  $\mathbf{CF}_q$ , respectively.

(1) If John had taken the bus, he would have been on time.

$\mathbf{CF}_p$ : John did not take the bus

$\mathbf{CF}_q$ : John was not on time

The inference  $\mathbf{CF}_q$  is sometimes **cancelled**, which is to say that there are conditionals that contain certain lexical items, or are uttered in certain contexts, for which  $\mathbf{CF}_q$  not being inferred. Here is one example, in which the presence of the word ‘also’ has the effect of cancelling  $\mathbf{CF}_q$ :

(2) A: John took the subway and was on time for our meeting.

B: Well, if John had taken the bus, he would ALSO have been on time.

Here  $CF_q$  of the underlined counterfactual conditional is cancelled, because it is felicitously uttered in a context that makes the consequent true (John was in fact on time).

This dissertation asks in which cases  $CF_q$  gets cancelled, and what theoretical explanation we can give for this cancellation. As is the case with most problems in linguistics, this question contains an empirical and an analytic part. The empirical task is to characterize the set of contexts that cancel  $CF_q$ . That this is not straightforward is indicated by the observation that not all instances of ‘also’ in the consequent of a subjunctive conditional result in a cancellation of  $CF_q$  (as does happen in (2)).

(3) A: John met Mary yesterday.

B: If John had gone to the party, he would also have met LINDA.

Although the underlined conditional in (3) appears to have a very similar form as the one in (2), here we infer that John did not meet Linda, hence  $CF_q$  is not cancelled, but triggered in the normal fashion. This leads to an important new empirical generalization: some but not all instances of ‘also’ in the consequent of a subjunctive conditional have the effect of cancelling  $CF_q$ .

Moreover, many speakers can use ‘still’ instead of ‘also’ in (2):

(4) If John had taken the bus, he would still have been on time.

‘Still’ here appears to have roughly the same meaning as ‘also’ and likewise results in the cancellation of  $CF_q$ . Just as for ‘also’ though, not all instances of ‘still’ cancel  $CF_q$ :

(5) A: John had been singing for an hour when someone rang at the door, and he stopped.

B: If John hadn’t heard the doorbell, he would still have been singing.

Here we infer that John is not still singing, so  $CF_q$  is not cancelled.

Finally, cancellation of  $CF_q$  is not always brought about by the presence of some lexical item (such as ‘still’ or ‘also’), but can be merely the result of the surrounding context. Imagine that



speaker A and B work for a large company that has just signed a lucrative business deal. Speaker A thinks that they got the deal because it was Mary that led the negotiations, and considers Mary to be the most qualified person to negotiate deals. Speaker B, however, thinks that many other people are able to do this.

(6) A: Mary is our best salesperson, so since Mary led the negotiations, we got the deal!

B: We've got lots of good people. If Peter had led the negotiations, we would have got the deal, and if John had led the negotiations, we would have got the deal, and if Linda had led the negotiations, we would have got the deal, . . .

B's utterance (which should be read with the intonation that is typical for listing things) contains counterfactual conditionals with consequents that are true in the context: the company actually got the deal. Hence (6) is another example of a context that cancels  $CF_q$ , although at this point it is not clear what makes the context of (6) special to set it apart from, say, (1) in which  $CF_q$  is triggered.

Examples (2), (4), and (6) represent key examples of  $CF_q$ -cancellation contexts, but do not form an exhaustive list of such contexts. Yet, it is already clear that the empirical situation is complicated: *some* conditionals containing 'also' in their consequent and *some* conditionals with 'still' in their consequent cancel  $CF_q$ , as well as some other conditionals by virtue of the context in which they appear, whose characterization is not immediately clear.

A major goal before I start with the theoretical analysis of  $CF_q$ -cancellation is to find an empirical characterization of the difference between (2) and (3), i.e. a characterization of when 'also' does and does not make a context that cancels  $CF_q$ . I will argue that this depends on how 'also' associates with *focus*. Looking back at examples (2) and (3), we can see that there is a prosodic difference between the two: 'also' is stressed in (2) but not in (3) (indicated by capital letters). This prosodic difference reflects the difference in focus association. In a similar way, I will show that whether or not 'still' leads to cancellation of  $CF_q$  depends on how 'still' takes scope with respect to the modal verb in the consequent of the conditional.

With a better view of the empirical situation, the analytic task is now twofold: (a) to say what these various  $CF_q$ -cancellation contexts have in common, and (b) to explain how this shared property leads to  $CF_q$  not being generated in these contexts. My analysis can be succinctly summarized by the following three independent claims:

- (A) The various  $CF_q$ -cancellation contexts are characterized by the pragmatic property that they are *multiple cause contexts* (they make more than one cause salient for the same consequent).
- (B) *Conditional perfection* (the pragmatic strengthening of conditionals into biconditionals) is a necessary ingredient for  $CF_q$  to arise.
- (C) Contexts with the pragmatic property in (A) do not have conditional perfection.

The logical conclusion of the conjunction of (A), (B), and (C) is that  $CF_q$  does not arise in the contexts empirically identified above, and thus constitutes an answer to the central question of when and how the counterfactual inference of the consequent is cancelled.

The (A) claim can be made separately for the different types of  $CF_q$ -cancellation contexts. As for the cases involving ‘also’, recall that whether or not they cancel  $CF_q$  depends on their association with focus. Focus association semantically relates to the generation of alternatives. In (2) the relevant alternatives are ways in which John can be on time for our meeting: John’s taking the subway, John’s taking the bus, etc. By the nature of these alternatives, they constitute different causes for the same consequent (namely, being on time for the meeting). I call such a context a *multiple cause context*. In (3), however, which has a different focus association, the relevant alternatives are people that John meets at the party (Mary, Linda, etc.). Because the alternatives are different from those in (2), in (3) it is not the case that different causes for the same consequent are generated, but rather different consequents (meeting Mary, meeting Linda, etc.). Hence, (3) does not make a multiple cause context.

The other types of  $CF_q$ -cancellation contexts are multiple cause contexts by virtue of the (implicit) question they answer. In (6) this is made explicit, as several causes for getting the deal are being listed. In some additional examples that we will encounter later on, this is less obvious. I show that in those cases it is the question under discussion (QUD) that the conditional statement

answers that determines whether or not multiple causes are salient.

The (B) claim goes back to an idea due to Karttunen (1971). He proposes that the generation of  $CF_q$  is the result of  $CF_p$  and *conditional perfection*. Conditional perfection refers to the pragmatic strengthening of conditionals into biconditionals, as illustrated (for an indicative) in (7).

(7) *Conditional perfection*

If you mow the lawn, I'll give you \$5. (Geis and Zwicky 1971)

↪ if you don't mow the lawn, I won't give you \$5

Karttunen's explanation for  $CF_q$  is schematically given in (8) (this is a simplified version that we will need to revise later on).

(8) *Karttunen's schema* (first version, to be revised) (Karttunen 1971)

Utterance:  $p \rightarrow q$

Implicatures:

$\neg p$  (counterfactuality of  $p$ )

$\neg p \rightarrow \neg q$  (conditional perfection on  $p \rightarrow q$ )

---

$\neg q$  (by Modus Ponens)

The crucial prediction of this, not discussed by Karttunen, is that in contexts in which for some reason no conditional perfection occurs,  $CF_q$  is not generated either. This provides a natural explanation of  $CF_q$ -cancellation, and is indeed the type of explanation that I will follow.

The (C) claim completes the analysis, since it says that multiple cause contexts do not have conditional perfection: together with the characterization in claim (A), and the prediction resulting from claim (B), it explains why and when  $CF_q$  gets cancelled. There exists an extensive pragmatic literature on conditional perfection that has proposed several restrictions on the occurrence of conditional perfection. The claim that multiple cause contexts block conditional perfection, however, is new, and I will show how it follows from various theoretical accounts of conditional perfection. The basic insight is quite intuitive. To illustrate, let's go back again to  $CF_q$ -cancellation contexts

with ‘also’: in (2) we do *not* have conditional perfection, since we do not infer the biconditional statement that *if and only if* John had taken the bus, he would have been on time, precisely because the subway, and other alternatives are salient as other hypothetical causes for being on time. In (3) on the other hand, we infer that if and only if John had gone to the party, he would have met Linda.

In recent theoretical work conditional perfection has been linked to discourse structure in the sense that conditional perfection is seen as the result of an exhaustive interpretation of a conditional answer (e.g. von Stechow 2001; Nadathur 2015; Herburger 2015a). I show that a conditional in a multiple cause context can not be taken to be exhaustive. This connection provides a new way to study counterfactuality: via Karttunen’s schema in (8) and my characterization of  $CF_q$ -cancellation contexts as multiple cause contexts, results and insights from the study of discourse structure and exhaustive answers can now directly be applied to the study of counterfactuality.

## 1.1 Background on conditionals

In this section I will introduce some basic concepts from the study of conditionals and counterfactuality in order to formulate the issues that I will be concerned with in more detail.

In simple terms, a *conditional* sentence is a sentence that has an adjunct clause introduced by ‘if’.<sup>1</sup> Following traditional terminology, this *if*-clause is called the *antecedent* of the conditional (irrespective of whether it is sentence-initial or sentence-final), and the main clause to which it attaches is called the *consequent*. Some examples of conditional sentences are given below, with their antecedents underlined.

- (9) a. John goes swimming if the weather is nice.
- b. If you’re hungry, there are biscuits in the kitchen.
- c. A: Mary really doesn’t like her job.  
B: Well, if she doesn’t like her job, she should quit.

---

<sup>1</sup>Although other syntactic constructions have been studied under the label of ‘conditional’ (see e.g. Declerck and Reed 2001: §1.3.1), I will not be concerned with them, and I will stick to the intuitive definition above.

It is notoriously difficult to give a more precise definition of a conditional sentence in terms of what it means or how it is used. While the three conditionals in (9) have the same syntactic shape, they express very different thoughts. The conditional in (9a) seems to live up to its name in giving a *condition* in the intuitive sense: a condition for John's going swimming (these conditionals are sometimes known as *event conditionals* or *hypothetical conditionals*). Sentence (9b) is different in that it does not give a condition for there being biscuits; it rather establishes that there *are* biscuits. The *if*-clause might still be said to give a condition, albeit in a different sense than in (9a): it arguably gives a condition for when it is appropriate to make the utterance 'there are biscuits in the kitchen'. As a result, conditionals as in (9b) are known as *speech act conditionals*, or alternatively as *biscuit conditionals* or *premise conditionals*. As for (9c), it does not seem right to say that it provides a condition at all, whether it is in the sense of (9a), (9b) or any other sense: its *if*-clause rather repeats something that was established in the discourse ('if' can here be replaced by 'given that'). Conditionals of this type are known as *factual conditionals*.<sup>2</sup>

As a topic that has been studied by logicians and philosophers since ancient times,<sup>3</sup> and is still very much on the forefront of research today, the literature on conditionals is enormous. I will suffice to point the reader to some recent, wide-ranging works on conditionals,<sup>4</sup> while concentrating below on the concepts that are important for the purposes of this dissertation.

**Two contrasts: indicative/subjunctive and one-past/two-past** A classic distinction that has played a central role in the research on the semantics of conditionals is between **indicative** and **subjunctive** conditionals, illustrated for example in the following famous pair (based on similar data in Adams 1970):

---

<sup>2</sup>This is a quick and informal sketch of one possible empirical classification of conditionals. There is of course much more to say about such a classification, and the properties of each of the classes, on which a large literature exists (Declerck and Reed 2001 is a work that aims to provide an analysis of classifying conditionals on various parameters, based on an extensive empirical foundation).

<sup>3</sup>See e.g. Bobzien (2016) on the Stoics' (3rd century BCE) work on conditionals.

<sup>4</sup>I will mention overviews from a descriptive linguistic perspective (English: Declerck and Reed 2001; cross-linguistic: Khrakovskij 2005), from a theoretical linguistic perspective (syntax: Bhatt and Pancheva 2006; semantics: von Stechow 2011), from a philosophical perspective (Bennett 2003), and from a psychological perspective (Oaksford and Chater 2010).

- (10) a. If Oswald didn't kill Kennedy, someone else did.  
b. If Oswald hadn't killed Kennedy, someone else would have.

Most speakers will take (10a) to be true on the basis of the fact that Kennedy was killed, but (10b) to be false unless they believe that the murder was a conspiracy involving alternative perpetrators. In a compositional theory of the meaning of conditionals, this truth-conditional difference must be explained on the basis of the difference in morphology between (10a) and (10b). While the terms 'indicative' and 'subjunctive' in the linguistic tradition refer to types of grammatical mood, the morphological difference in (10) appears to be one of tense and aspect instead. Indeed, it has been shown that the indicative/subjunctive terminology as applied to conditionals, which originates in a philosophical tradition, is not accurate from the point of view of the usual linguistic understanding of these terms.

Linguistically, the subjunctive refers to a verbal morphological paradigm that exists in a number of languages, which is typically triggered in complement clauses of verbs of volition, although it has proven to be very difficult to formulate a cross-linguistically valid characterization of the distribution of subjunctive mood (e.g. [Quer 1997, 2009](#)). Some languages with a separate morphological paradigm for the subjunctive use it to mark the contrast exemplified in (10) (e.g. Catalan<sup>5</sup>), but others do not (e.g. French). Then there are languages that do not have a subjunctive mood at all, but still have 'subjunctive' conditionals (e.g. Dutch). [Iatridou \(2000\)](#) argues on the basis of such cross-linguistic data that it is the past tense morphology and not the subjunctive mood that is responsible for the meaning differences attested in (10) (Iatridou's theory will be discussed in more detail in chapter 5). Yet, the use of 'subjunctive' and 'indicative' is so wide-spread that I will use these terms as well.

A second division that will be important throughout the text is a subdivision of subjunctive conditionals into **one-past** and **two-past** conditionals.<sup>6</sup> These terms refer to the tense morphology

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<sup>5</sup>See [Portner \(2011: 1286\)](#) for data.

<sup>6</sup>I borrow this terminology from [Ippolito's work \(2006\)](#). Other names exist in the literature, such as *present* vs. *past* counterfactuals ([Iatridou 2000](#)), *pattern-2* vs. *pattern-3* conditionals ([Declerck and Reed 2001](#)), *simple past* vs. *past perfect* conditionals ([Ippolito 2013b](#)), and reference to antecedents with *simple* vs. *perfect* morphology ([Arregui 2007](#)).

in the antecedent, in the sense that, as the name suggests, one-past conditionals have one layer of past tense in the antecedent (*were* or another verb in the past tense), while two-past conditionals have two layers of past tense (i.e. a pluperfect, e.g. *had been*). The tense morphology of the consequent typically mirrors that of the antecedent.

- (11) a. If Mary is late today, she will be fired. [indicative]  
b. If Mary were late today, she would be fired. [one-past subjunctive]  
c. If Mary had been late today, she would have been fired. [two-past subjunctive]

We will see below that there are a number of meaning differences between one-past and two-past subjunctive conditionals, that linguistic theories of subjunctive conditionals have tried to account for.

**Formal semantics** How the meaning differences between the conditionals in (10) (and eventually the three-way contrast in (11)) are to be accounted for in terms of formal semantics, remains a central question in linguistic semantics. Since almost all of the arguments to be presented in this dissertation can be made without reference to specific details of a semantic theory of conditionals, I will at this point cover just the basic ideas required for upcoming discussion (only in chapter 7 I will need to present a semantic theory of conditionals in more theoretical detail).

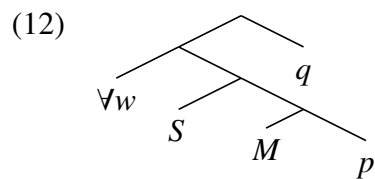
One semantic analysis that has been dominant in the linguistic study of conditionals is the **restrictor analysis**, which is a cover term for a number of different analyses that share a common core.<sup>7</sup> The restriction analysis can be seen as a linguistic extension of the possible-worlds semantics of conditionals originating in the philosophical tradition (Lewis 1973). The linguistic extension lies in being more precise about how the meaning of the conditional comes about in a compositional manner. First, Kratzer (1979, 1986) proposed that the compositional role of the *if*-clause is to *restrict* the domain of quantification of a modal operator (hence the name ‘restriction analysis’; this approach is also known as the ‘Lewis-Kratzer-Heim view’; Partee 1991: 176).

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<sup>7</sup>Of course there exist several alternatives to the restrictor analysis, see e.g. von Stechow (2011) for an overview.

Later, further compositionality has been added by showing how tense and aspect operators may interact with this structure (e.g. in the work by [Ippolito 2003](#) et seq., to be reviewed in chapters 5 and 7).

In concrete terms, a conditional is seen as a *modal* structure with universal quantification over possible worlds, in which the antecedent is in the restriction of the quantifier, and the consequent is in its nuclear scope. In a doubly relativized modal structure with ordering source  $S$  and modal base  $M$ , the basic structure of a conditional is as follows:



Collapsing the modal base and the ordering source to a single ‘restriction’  $R$  for simplicity, the restriction analysis can thus be succinctly summarized as giving a conditional the following truth conditions:<sup>8</sup>

(13) When defined,  $\llbracket \text{if } p, q \rrbracket^w = 1$  iff  $\forall w' [(R(w, w') \wedge p(w')) \rightarrow q(w')]$ .

Let me stress that this is just the minimal template of the restrictor analysis, as it does not specify the nature of  $R$ , the role of tense operators, or the definedness conditions (presuppositions) of conditionals.<sup>9</sup>

The contrast between indicatives and subjunctives under the restrictor analysis has been modeled as a difference in precisely the aspects the template in (13) underspecifies: some accounts argue it relates to a difference in the modal base (e.g. metaphysical vs. epistemic modal base,

<sup>8</sup>This template is essentially what [Herburger \(2015b: 285\)](#) refers to as the ‘universal conditional’ analysis, the general idea that conditionals are modal statements with universal force.

<sup>9</sup>Although this template encompasses the ‘strict analysis’ for counterfactuals (roughly,  $R$  means the ‘accessible worlds’), it does not represent the ‘variably strict analysis’ (thanks to Gabriel Greenberg (p.c.) for pointing this out to me). In the variably strict analysis the domain of quantification is restricted to the closest accessible  $p$ -worlds. Hence the restriction  $R$  depends not only on the world of evaluation  $w$ , but also on the proposition  $p$ . I will stick to the simpler representation in (13) here, although the claims in the dissertation that depend on (13) (especially in chapter 6) can be rephrased in terms of a variably strict analysis of counterfactuals.



cf. Ippolito 2006: fn 46), some to a difference in the tense operators, and some to a difference in the presuppositions of the conditional utterance (or various combinations of these three). These matters will be discussed in more detail in chapter 5.

**Notation** I will use ' $p \rightarrow q$ ' as the general notation for a conditional 'if  $p$ ,  $q$ '. The notation ' $p \rightarrow q$ ' is underspecified for the morphological type of conditional (i.e. neutral with respect to indicative/subjunctive), as well as for the semantic analysis (it does not specifically mean material conditional, or any other specific semantics). At some places I will need to specifically denote a subjunctive conditional, which I will write as ' $p \Box \rightarrow q$ '. This notation is borrowed from Lewis (1973), but by using ' $\Box \rightarrow$ ' I do not mean that I adopt Lewis's semantic theory for counterfactuals.

## 1.2 Counterfactuality: $CF_p$ and $CF_q$

Most subjunctive conditionals have another property, namely they are **counterfactual**, the central notion in this dissertation.

(14) If I had taken the bus, I would have been on time.

$\mapsto CF_p$ : I did not take the bus

$\mapsto CF_q$ : I was not on time

Upon hearing (14) the listener will normally infer that in actual fact I did not take the bus, and I was not on time. These are examples of **counterfactual inferences**: inferences that something is contrary to fact, that is not true in the actual situation of utterance.

**Notation** Throughout the text I will refer to the antecedent of a conditional as  $p$  and to the consequent as  $q$  (as in  $p \rightarrow q$ ). The inference that the antecedent is counterfactual is written  $CF_p$ , and the inference that the consequent is counterfactual is written  $CF_q$ .

$CF_p$  and  $CF_q$  are not only inferences that the interlocutors may draw upon hearing a subjunctive conditional, they also function as *felicity conditions*. If it is known from the context that the antecedent or the consequent is true, uttering a subjunctive conditional is not felicitous. This is perhaps best illustrated in cases in which world knowledge provides such information:

- (15) a. #If tomatoes had been red, they would have grown on trees. (antecedent true)  
b. #If tomatoes had been blue, they would have been sold in grocery stores.  
(consequent true)

Inferential judgments and felicity judgments are often taken to be two sides of the same coin, for example in the literature on presupposition, where presuppositions as admittance conditions give rise to certain inferences by means of accommodation (e.g. Chemla and Schlenker 2012). However, in order to avoid any precocious conclusions on the status of the inferences in (14) or the data in (15), let me be careful and present these data as independent empirical facts of English. I will use the neutral term ‘supposition’ to refer to the propositional content of inferences or felicity conditions like the ones illustrated above.

### 1.2.1 Strong and weak counterfactuality

That a speaker takes a certain proposition ‘to be false in the actual world’ is a somewhat vague statement, as there is more than one way in which a speaker could be said to be in such a belief state. Of course, a speaker may simply know that  $p$  is false. This can be written as  $K\neg p$ , and all examples of subjunctive conditionals mentioned so far were uttered in a situation where either  $\neg p$  was explicitly asserted, or where the speaker had this belief. The speaker may also hold a weaker belief and be ignorant about the truth of  $p$ , i.e.  $\neg Kp \wedge \neg K\neg p$ . Some subjunctive conditionals can be uttered in contexts that realize this second, weaker, situation:

- (16) I don’t know if he is rich, but if he were rich, he would be popular with that crowd.  
(Iatridou 2000: 253)

The relevance of the distinction regarding the speaker's belief with respect to  $p$  lies in the observation that not all subjunctive conditionals can be felicitously uttered in an 'agnostic' context as in (16). Example (16) is a one-past subjunctive conditional, but when we try to utter a two-past conditional in that same context, this results in infelicity:

(17) #I don't know if he is rich, but if he had been rich, he would have been popular with that crowd.

This aspect of the distribution of one-past and two-past subjunctive conditionals is not always taken into account in the literature on counterfactuality. Ippolito (2006, 2013b), however, takes a special interest in data of this type, and explains the contrast in her theoretical account (to be discussed in section 5.2.3). The distinction in (16/17) leads to some terminological confusion about the label 'counterfactual'. Some authors use the term 'counterfactuality' only to refer to the stronger case in (17) (e.g. Ippolito, so she says that one-past subjunctives need not be counterfactual), while others use the term to include both types. In order to avoid confusion, whenever this distinction is relevant to the discussion I will call subjunctive conditionals that can only be uttered when the speaker knows  $p$  is false **strongly** counterfactual, and conditionals as in (16) **weakly** counterfactual.

As far as I know, the weak/strong distinction has only been discussed in relation to  $CF_p$ , and never for  $CF_q$ . I will make some remarks on this distinction for  $CF_q$  here, but they will remain speculative because judgments of the corresponding data are difficult.<sup>10</sup> Consider (18), in which the speaker is agnostic about the truth of  $p$  (whether or not Mary went to Harvard). This could be part of a 'detective reasoning' context, in which it is not known whether Mary has a good job. So in this case (18) is indeed licensed when the speaker is agnostic of  $q$ , which would correspond to *weak*  $CF_q$ .

(18) We don't know where Mary went to school, but if she went to Harvard, she would have a good job now.

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<sup>10</sup>On a theoretical level, we will see later on that my account predicts that if  $p$  is weakly counterfactual, we no longer conclude that  $q$  must be strongly counterfactual, because the (strong) premiss  $\neg p$  in Karttunen's schema (8) is not met.

The problem is that it is not clear whether this sentence might also be uttered in a context in which we know that Mary did *not* go to Harvard, but remain agnostic about what job she got. Although some native speakers I asked suggested that a two-past conditional is better in that scenario, a more thorough investigation should verify these subtle judgments.

The same holds for the question if we can formulate a  $CF_q$ -version of Ippolito's claim that the weak/strong  $CF_p$  distinction is reflected in the one-past/two-past morphological contrast as in (16)/(17). The one-past or two-past status of course holds for the conditional as a whole, so we cannot test the effect of morphology on the counterfactuality of the consequent without also affecting the antecedent. We might try to come up with cases in which  $p$  is strongly counterfactual (compatible both with one-past and two-past conditionals), but  $q$  is weakly counterfactual. The question is then if both the one-past and two-past conditionals are licensed.

- (19) [context: There is a race tomorrow, and the winner will qualify for the Olympic team. After that, there will be more opportunities to qualify for the Olympic team. John doesn't take part in tomorrow's race, but is planning to take part in some of the future qualifying events.]
- a. If John ran tomorrow's race, he would qualify for the Olympic team.
  - b. If John had run tomorrow's race, he would have qualified for the Olympic team.

The judgments are difficult here, because the conditionals are future-oriented, and because of the presumed causal link between running the race and qualifying for the Olympic team. Investigating data like (18) and (19) needs more work (and possibly experimental verification). I leave this to future research.

### 1.2.2 Cancellation of $CF_p$

An important property of counterfactual suppositions is that they are **context-sensitive** and **cancelable**, which is to say that when uttered in certain contexts, the counterfactual suppositions normally associated with subjunctive conditionals are not drawn. This is a well-known observation in the literature when it relates to the counterfactuality of the *antecedent*, i.e.  $CF_p$ . In this

dissertation I shall be primarily concerned with context-sensitivity and cancellation of  $CF_q$ , but before I turn to that I will review some familiar observations about  $CF_p$ .

Examples of  $CF_p$ -cancellation are usually of the type of [Anderson's \(1951\)](#) famous example (20), in which a counterfactual conditional is uttered in the course of arguing for the truth of  $p$ .

(20) If Jones had taken arsenic, he would have shown just exactly those symptoms which he does in fact show. [So, it is likely that he took arsenic]. ([Anderson 1951](#))

Two main conclusions have been drawn from this example. First, that there exist non-counterfactual subjunctives. This shows that subjunctive conditionals are not the same as counterfactual conditionals (even though these labels are still often used interchangeably; see [von Fintel 1998](#) for more on the alleged complementary distribution of indicative/subjunctive and factual/counterfactual). The second conclusion is the widely made point that the existence of cases like (20) shows that  $CF_p$  is not a logical entailment or a presupposition, as these are generally taken not to be cancellable ([von Fintel 1998](#): 1; [Iatridou 2000](#): 232; [Ippolito 2003](#): 147, 2013b: 25; [Arregui 2007](#): 224; [Leahy 2011](#): 258; [Karawani 2014](#): 157; see [Schulz 2007](#): 241 for a critical note).

A related point is made on the basis of so called *modus tollens* arguments, as given by [Stalnaker \(1975\)](#):

(21) The murderer used an ice pick. But if the butler had done it, he wouldn't have used an ice pick. So the murderer must have been someone else. ([Stalnaker 1975](#): 277)

Here we can felicitously assert  $\neg p$  after a counterfactual conditional that generates  $CF_p$ , without there being a redundancy. This property is called *reinforcability*, and is another classic diagnostic that sets implicatures apart from logical entailments.

I will now briefly discuss three types of restrictions on the cancellation shown in (20) that have been brought to attention in the literature, to illustrate the complexity of the issue of cancellation. First, the surrounding context affects the felicity of the Anderson case itself. Second, there are restrictions that have to do with the tense morphology in the conditional. Finally there is cross-

linguistic variation with respect to the possibility of  $CF_p$ -cancellation, relating to how languages mark subjunctive conditionals.

Von Fintel (1998) gives the following pair, which he attributes to Portner:

- (22) a. Did Jones take arsenic? If Jones had taken arsenic, he would have shown just exactly those symptoms which he does in fact show. [So, it is likely that he took arsenic].
- b. I will claim that Jones took arsenic. ??If Jones had taken arsenic, he would have shown just exactly those symptoms which he does in fact show. [So, it is likely that he took arsenic].

Portner suggests that for cancellation of  $CF_p$  to be possible in Anderson-type cases, “context must somehow make available the hypothesis that the antecedent is false” (quoted in von Fintel 1998: 9). This happens in (22a) but not in (22b), as a result of the different discourse roles of assertions and questions: “the question in [(22a)] causes us to split the context into two hypothetical ones, and the counterfactual is interpreted with respect to the one which entails that he didn’t take arsenic. In contrast, with [(22b)] there’s no available common ground which entails that he didn’t” (p. 10).

The one-past/two-past distinction is relevant to cancellation of  $CF_p$  by a result that has been dubbed ‘Ippolito’s generalization’:

- (23) *Ippolito’s generalization* (Ippolito 2003: 147, 2013b: 25-26)
- $CF_p$  is cancellable in one-past subjunctive conditionals and non-future two-past subjunctive conditionals, but not in future oriented two-past subjunctive conditionals.<sup>11</sup>

Here is an example of a future oriented two-past subjunctive conditional in which cancellation of  $CF_p$  fails:

- (24) #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: 147)

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<sup>11</sup>Later in her 2003 paper, Ippolito suggests that some future oriented two-past subjunctive conditionals are in fact cancellable (2003: 177), but only under circumstances “in which it is enough [for the speaker] to inform his audience about his past epistemic states” (p. 177). I will not go into these details here.

Ippolito (2013b: §3.4.4) explains this contrast in her theory by assuming that the difference between one-past and two-past subjunctive conditionals leads to pragmatic competition, resulting in an inference of a type that is not cancellable (see chapter 5 for more background).

**Cross-linguistic variation** The English data show that the possibility to cancel  $CF_p$  depends on the surrounding context and the layers of tense morphology in the antecedent. When one starts looking at other languages, one finds that the cancellability is also determined by the way counterfactuality is marked. English does not have a dedicated morpheme that marks counterfactuality, but instead uses tense and aspect morphology to mark the contrast in (11). I will discuss theoretical proposals of how the past tense in English can serve this role in chapter 5, but anticipating somewhat, one major idea is that the past tense in subjunctive conditionals is not interpreted in its usual temporal sense, but rather ‘modally’ (also known as ‘fake tense’).

(25) *Nevins’s generalization* (Nevins 2002)

Only languages that mark counterfactuality by ‘fake past tense’ can cancel  $CF_p$ .

Nevins (2002) shows that languages that have dedicated counterfactuality markers do not allow for Anderson-type examples (he cites data from Tagalog, Chinese, and Slovenian). Moreover, Biezma et al. (2014) show that there are English dialects that allow *three* layers of past tense, and cancellation is not possible there (cf. Ippolito 2013b: 98).<sup>12</sup> Some additional discussion of Nevins’s (2002) work, and in particular its relevance to  $CF_q$ , will follow in section 5.2.2.

### 1.3 Main questions and motivation

So far, in this chapter, I have – in very brief terms – introduced some important notions in order to describe the central phenomena to be studied in this dissertation: subjunctive conditionals and the counterfactual suppositions that they may have. I am now in a position to formulate the main

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<sup>12</sup>See Ippolito (2004b) for work on the non-cancellability of  $CF_p$  in ‘imperfect conditionals’ in Italian, a type of conditional that carries a counterfactual inference  $CF_p$  but also differs from regular counterfactuals.

research questions I aim to answer, and justify why the phenomenon of counterfactuality is worth further investigation.

In English, there is no dedicated morpheme that conveys counterfactuality: the counterfactual suppositions in (14) are not encoded in a morpheme that specifically and exclusively expresses  $CF_p$  or  $CF_q$ . Instead, counterfactuality must be a by-product of the mood marking (indicative/subjunctive) and tense/aspect marking (one-past/two-past) marking, since that is all the morphological difference between indicatives, one-past subjunctives and two-past subjunctives (recall (11)). This raises the question of which mechanism generates a counterfactual inference. Answering this question includes identifying the semantic status of  $CF_p$  and  $CF_q$ : are they logical entailments, presuppositions, pragmatic implicatures, or something else? The question also involves explaining how the inferences are compositionally derived from the grammatical ingredients of a conditional statement. A second major question relates to the empirical distribution of counterfactual suppositions, and asks when they arise and when they can get cancelled. Does the cancellability depend on the type of conditional, its morphological shape, or on the context in which it appears? In the previous section, we have already seen data that suggest that all of these play a role in the cancellation of  $CF_p$ . The final step is to show that the theoretical explanation for how counterfactual inferences are generated, also correctly explains any such restrictions.

These two major questions, which are the primary focus of the *linguistic* study of counterfactuality, are thus about the **source** and the **distribution** of counterfactual inferences:

(26) Source question      What is a counterfactual inference, and how does it arise?

Distribution question    When does a counterfactual inference arise, and when can it get cancelled?

The two questions are of course interrelated, because the possibility of cancellation restricts the potential answers to the Source question (for example, logical entailments are usually not taken to be cancellable). However, since these are two big questions that each draw on their own set of empirical evidence, it is useful to separate them.



Almost all earlier work has only considered the two questions in (26) with respect to  $CF_p$  (the counterfactuality of the antecedent  $p$ ), perhaps under the silent assumption that what can be said about the antecedent extends, *mutatis mutandis*, directly to the consequent. In this dissertation I will focus on  $CF_q$  instead, and formulate an answer to the Source and Distribution questions for  $CF_q$ . I will show that it definitely *cannot* be assumed that  $CF_q$  is a subcase of  $CF_p$ , since  $CF_p$  and  $CF_q$  are distinct empirical phenomena. This will become particularly clear when I talk about cancellation of  $CF_q$ :  $CF_q$  can be cancelled in a much wider set of contexts than  $CF_p$  (to be seen in chapter 2). Moreover, we will see that existing theories for  $CF_p$  cannot explain the facts about  $CF_q$ .

The goal of this dissertation is therefore to give a general account of counterfactuality, based on two innovations. First, the idea that counterfactuality of the consequent,  $CF_q$ , should be accounted for theoretically as an empirical phenomenon in its own right.

$CF_p$  and  $CF_q$  are empirically and theoretically distinct phenomena.

Second, the idea that counterfactuality is a *discourse* phenomenon. By this I mean that we should not just concentrate on how exactly the mood and tense morphology bring about a counterfactual inference (this is what a lot of earlier literature has exclusively focused on), but that the structure of the discourse plays a crucial role in whether or not a counterfactual inference is drawn. Although the discourse-sensitivity of  $CF_p$  is quite well-known (see section 1.2.2), this can't be said of  $CF_q$ , even though the context-sensitivity of  $CF_q$  is much stronger than that for  $CF_p$ , as we will see. A theoretically precise explanation of how discourse plays a role in affecting counterfactuality has not yet been implemented in accounts of counterfactuality.

Counterfactuality is a discourse phenomenon

The above remarks, I hope, have sufficed to convince the reader that the study of  $CF_q$  that I am about to start is well motivated for semanticists and pragmaticists interested in conditionals.

There may, however, be the impression that the topic's relevance is restricted to just that. Let me therefore try to explain the broader impact of the current project to study of language more generally. I think this impact is twofold. First, we will encounter a wide variety of contexts in which  $CF_q$  can be cancelled, which means that studying this type of cancellation will lead to investigations of various topics not directly related to conditionals. For example, I will talk about focus particles, presupposition projection, contrastive topic, intonation, the question-answer structure of discourse, exhaustive answers, the nature of events, modal subordination, and more. This puzzle about conditionals will thus relate to many linguistic levels of representation: syntax, semantics, pragmatics, information structure, intonation.

Second, counterfactuality is a type of meaning that is not literally expressed, and is moreover highly context-sensitive. This makes it one of the hardest types of meaning to investigate and analyze. Yet, I will develop a precise theory that describes the behavior of  $CF_q$ . In particular I will show how a set of analytic tools from one area, that of the question-answer structure of discourse, can be applied to another area, that of counterfactual inferences. The more general contribution of this study thus lies in how the theory of discourse can be made to apply to a context-sensitive phenomenon in a distinct area of the field.

**External motivation: counterfactual thinking** In addition to having relevance inside the field of linguistics, which may be called the *internal* motivation of my research topic, a good topic in linguistics should also be *externally* motivated, in that it has relevance outside of the field of linguistics proper. I believe that studying counterfactual conditionals is particularly well-motivated in this sense, because of their close connection to a large body of literature in the psychological and artificial intelligence literature on conditional types of reasoning.

Counterfactual conditionals form the linguistic manifestation of *counterfactual reasoning*: reasoning about what might have been or how things could have been different. As a result, counterfactuality, which might be considered as a relatively narrowly constrained phenomenon within linguistic semantics, is a topic that has been widely studied outside of linguistics. In particular, a

large literature exists in psychology (focusing on the relation of counterfactuality to human thinking and imagination, see [Byrne 2005](#)), and in philosophy (important topics include for example the relation to causality<sup>13</sup> and modal knowledge<sup>14</sup>). People engage in counterfactual reasoning frequently and in a variety of social activities, such as reasoning, learning from mistakes, expressing various emotions, etc. In this form of reasoning people change certain aspects of their representation of reality, but leave others unchanged. Research in psychology has shown that this does not happen randomly, but that there are tendencies with respect to which aspects people change, and which they leave intact. Examples of these “fault lines of reality” ([Byrne 2005](#): 3) are that people tend to evaluate alternatives to actions rather than to failures to act, to exceptional activities rather than to routine ones, to situations that differ only slightly rather than a great deal from the actual world, etc. ([Kahneman and Tversky 1982](#); [Byrne 2005](#)).

Counterfactual reasoning has been contrasted with other types of conditional reasoning. Experimental work has shown that there is a strong difference between how people reason about indicative and counterfactual conditionals, for example by considering the types of inferences they are willing to make on the basis of them (see [Thompson and Byrne 2002](#), and my [Appendix A.3](#) for discussion). This has led to the development of different mental models for counterfactual reasoning and non-counterfactual conditional reasoning (e.g. [Evans 1993](#); [Thompson and Byrne 2002](#); [Byrne 2005](#)). The importance of the linguistic study of conditionals to all this lies in the direct relation between types of reasoning and their surface form in language. In particular the way the indicative/subjunctive contrast is marked in language is relevant because this translates to significant psychological differences, as I just mentioned. The particular relevance of the topic of this dissertation is that it emphasizes the large role of the surrounding discourse in how speakers draw counterfactual inferences. This thus also translates to the role of discourse in counterfactual reasoning.

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<sup>13</sup>This is based on the idea that there is a relation between ‘A caused B’ and ‘if A hadn’t occurred, B wouldn’t have occurred’. See e.g. [Pearl \(2000\)](#) and [Menzies \(2014\)](#) and references therein.

<sup>14</sup>This is based on the idea that the necessity of  $\varphi$  can be equivalently expressed as ‘if  $\varphi$  weren’t the case, there would be a contradiction’ or symbolically ‘ $\Box\varphi \equiv \neg\varphi \Box\rightarrow \perp$ ’ ([Williamson 2005](#)). This might give, in combination with the psychological work on counterfactual reasoning, a better understanding of the actual cognitive processes underlying modal judgments (see [Sauchelli 2010](#) on this).

## 1.4 Outline of the dissertation

As pointed out in the preview (section 1.0), the structure of the dissertation can roughly be divided into an empirical part and an analytic part. The empirical part provides a characterization of the class of contexts in which  $CF_q$  gets cancelled, and the analytic part explains how that characterization is linked to the generation of the  $CF_q$  inference. In a long and complex text like this dissertation, however, it is not always possible to keep the empirical and analytic parts completely separate. In this particular case, the main reason for this is that the  $CF_q$ -cancellation contexts are quite different from each other, and require different theoretical explanations (for example, to discuss ‘also’, we need to get into the theory of focus particles, to discuss ‘still’ into modality, etc.). Because I will propose essentially the same analysis for why in all of these contexts  $CF_q$  is not generated, it is possible to develop the analysis in detail on the basis of one type of  $CF_q$ -cancellation context first. After that, for each of the remaining  $CF_q$ -cancellation contexts, I will have a shorter discussion to show that these cases are sufficiently similar in the relevant aspects that the general argument applies to them too. This is the line that I will follow: I will begin with the  $CF_q$ -cancellation contexts that contain ‘also’ and build the analysis from there.

As noted in the preview, the analysis can be summarized in three main claims, called (A), (B), and (C). These correspond to chapters in the following way:

Data	Determine empirically the class $S$ of contexts that are $CF_q$ -cancellation contexts.	chs. 2, 3
Analysis	(A) The contexts in $S$ are characterized by the pragmatic property that more than one antecedent is salient for the same consequent.	ch. 4
	(B) Conditional perfection (the pragmatic strengthening of conditionals into biconditionals) is a necessary ingredient for $CF_q$ to arise.	ch. 5
	(C) Contexts with the pragmatic property in (A) do not have conditional perfection.	ch. 6

Table 1. Roadmap

The structure of the dissertation follows the above diagram, although more specifically I am making the (A) claim separately for different  $CF_q$ -cancellation contexts (with the contexts with ‘still’

discussed separately in chapter 7). I will repeat Table 1 at the beginning of each chapter of the analysis as a ‘roadmap’ that may guide the reader through the dissertation.

**Detailed outline** Chapter 2 presents the central data to be discussed in the dissertation: data in which  $CF_q$  is cancelled independently of  $CF_p$ . I will identify three groups of conditionals in which this happens.

As pointed out in the preview, the presence of ‘also’ in the consequent of a subjunctive conditional does not always lead to cancellation of  $CF_q$ . In chapter 3 I pick up on the empirical question of when ‘also’ does and does not lead to cancellation of  $CF_q$ . The main claim is that this depends on how ‘also’ associates with focus. I introduce the important terminology of *local ‘also’* for the instances of ‘also’ that do not lead to cancellation of  $CF_q$  (‘local’ because ‘also’ takes an associate within its own clause), and *non-local ‘also’* for the instances of ‘also’ that do lead to cancellation of  $CF_q$  (‘non-local’ because ‘also’ takes an associate outside its own clause). The second half of the chapter (sections 3.2 and 3.3) is more theoretical, as I explain that the behavior of local ‘also’ (which is not part of our main puzzle, since there is no  $CF_q$ -cancellation) is explained by existing theories of the focus particle ‘also’ and the semantics of conditionals.

In chapter 4, I start with the analysis. Claim (A) will be made for the ‘also’ cases. By considering the prosodic properties of ‘also’ in conditionals, I draw a parallel to so-called *postposed stressed additive particles*. This label refers to additive particles that become stressed when, loosely speaking, they appear in a discourse context containing a *contrastive topic* (Krifka 1999). After introducing contrastive topic (section 4.2) and postposed stressed additive particles (section 4.3), I discuss what it means for conditionals to contain a contrastive topic (section 4.4). The difference in focus association between local and non-local ‘also’ from chapter 3 corresponds semantically to differences in the generation of *alternatives*. I use this to introduce the central notion of a *multiple cause context* (section 4.5): non-local ‘also’ signals a multiple cause context because the alternatives it generates form different causes for the same consequent, but local ‘also’ does not signal such a context because it corresponds to a different set of alternatives.

At this point I also show that some of the other cancellation contexts from chapter 2 (ones that do not contain ‘also’) can be shown to be multiple cause contexts, again by drawing parallels to the study of postposed stressed additive particles. This shows why it made sense to start with ‘also’, and build the analysis from there in order to obtain a more general conclusion. Finally, sections 4.7 and 4.8 extend Krifka’s (1999) pragmatic theory of postposed stressed additive particles so that it applies to conditionals.

Chapter 5 defends claim (B): the idea that  $CF_q$  is related to conditional perfection is due to Karttunen (1971), and I adopt his theory. Because this is a crucial step in my analysis, I also show why other potential explanations for the generation of  $CF_q$  do not work. In particular, I show how existing theories for the counterfactuality of the *antecedent*, including Iatridou’s (2000) ‘fake tense’ theory and Ippolito’s (2006) ‘real tense’ theory, cannot be extended to account for counterfactuality of the *consequent*.

The final step in the analysis, (C), is covered in chapter 6. I introduce the pragmatic phenomenon of conditional perfection (section 6.1). I then derive a new result about restrictions on conditional perfection, namely that multiple cause contexts do not trigger conditional perfection. We will see that although allusions to this result have been made at several points in the literature, the claim has never been made in full generality. In section 6.3 I review various pragmatic theories for conditional perfection, and show how the result is derived in those theories. In particular, recent theories of conditional perfection have linked the phenomenon to discourse structure and exhaustive answers (e.g. von Stechow 2001; Nadathur 2015; Herburger 2015a). This makes it possible to apply tools from the study of the question-answer structure of discourse directly in the domain of counterfactual conditionals.

Chapter 7 is devoted to the cancellation data involving ‘still’. These deserve a separate chapter because they introduce some additional puzzles. I will first introduce some existing theories of ‘still’ (section 7.2) and argue that these theories need to be modified in a technically important but conceptually non-essential way in order to explain the cases of ‘still’ that do not cancel  $CF_q$ . Then, in section 7.4 I argue that the difference between ‘still’ that cancels  $CF_q$  and ‘still’ that does not

have this effect, is reducible to a difference in *scope* between ‘still’ and the modal verb inside the conditional. Related to chapter 7 is Appendix A, in which I report on experiments I conducted to investigate how speakers choose between ‘also’ and ‘still’ in  $CF_q$ -cancellation data.

In the conclusion, chapter 8, I return to some themes from the introduction, and discuss what are the similarities and differences in how  $CF_p$  and  $CF_q$  are discourse sensitive. This will sketch a general picture of counterfactuality in natural language.

**Terminology** In a number of places in the dissertation I will introduce some new terminology, that will be used extensively throughout the dissertation, but not redefined each time. The reader may find it helpful to bookmark this page for future reference (or dog-ear the page, if good old paper medium is used).

## Concepts

### $CF_p$

counterfactual inference that the antecedent is false; section 1.2

### $CF_q$

counterfactual inference that the consequent is false; section 1.2

### $CF_q$ -cancellation context

context in which  $CF_q$  is cancelled; chapter 2

### local ‘also’

instance of ‘also’ in the consequent of a conditional that takes a focus associate inside its own clause, and that does not lead to cancellation of  $CF_q$ ; section 3.1

### non-local ‘also’

instance of ‘also’ in the consequent of a conditional that takes a focus associate outside its own clause, and that leads to cancellation of  $CF_q$ ; section 3.1

## Concepts (cont)

### **multiple cause context**

context in which more than one cause for the same consequent is salient; section [4.5](#)

### **consequent-internal 'still'**

instance of 'still' in the consequent of a conditional that is interpreted inside the consequent, and that does not lead to cancellation of  $CF_q$ ; section [7.2](#)

### **consequent-external 'still'**

instance of 'still' in the consequent of a conditional that is interpreted outside the consequent, and that leads to cancellation of  $CF_q$ ; section [7.3](#)



## 2 Data: cancellation of $CF_q$

In section 1.2.2 I discussed the well-known observations from the literature that the counterfactual inference of the antecedent (written  $CF_p$ ) can be cancelled in so-called ‘Anderson cases’ (see (20); repeated below).

(27) If Jones had taken arsenic, he would have shown just exactly those symptoms which he does in fact show. [So, it is likely that he took arsenic]. (= (20))

Moreover, it was noticed that there are some restrictions on the context and the form of the conditional for this type of cancellation to be possible: we saw that Anderson cases need to be uttered in a context that makes the possibility of  $\neg p$  available, and Anderson examples cannot be constructed using future oriented two-past subjunctive conditionals.

I now shift attention to the key data in this dissertation: the less well-studied case of the cancellation of the counterfactuality of the consequent,  $CF_q$ . The crucial empirical point is that  $CF_q$  can be cancelled *independently* of  $CF_p$ , i.e. there are contexts in which  $CF_q$  gets cancelled but  $CF_p$  is triggered in the normal fashion. Moreover, we will see (not only in this chapter, but throughout the text) that the types of restrictions on the context and the structure of the conditional that are in place on  $CF_q$ -cancellation are of a very different type than the restrictions we saw for  $CF_p$  in the previous chapter. These two observations are of theoretical importance as they are an important indication that a parallel analysis of  $CF_p$  and  $CF_q$  – or an analysis that sees  $CF_q$  as a special subcase of  $CF_p$  – is, at the very least, problematic and in need of further investigation. Yet, this observation has not been made often in the literature, and when it is made, it is based on a limited, non-representative set of examples. Below I will present a more exhaustive list of  $CF_q$ -cancellation contexts.

**Also and still** The two most common examples are given in (28) and (29). They illustrate how the lexical items ‘also’ and ‘still’ may form subjunctive conditionals that are felicitous in a context that makes the consequent true.

(28) *Also* (Iatridou 2000: 232n)

A: John is very rich and his wealth has gotten him quite a few friends.

B: Yes, but if he had been nice he would **also** have had friends.

B': #Yes, but if he had been nice he would have had friends.

(29) *Still* (Declerck and Reed 2001: 266)

A: We are on time because we have taken the road I said we should take.

B: If we'd taken the other road, we would **still** have been here in time.<sup>15</sup>

B': #If we'd taken the other road, we would have been here in time.

The B utterances are subjunctive conditionals in which  $CF_p$  is not cancelled (John is not nice; we did not take the other road), but  $CF_q$  is: A's utterance makes it clear that John does have friends in (28) and that we did arrive on time in (29). The same utterances without the words 'also' and 'still' (given as B') are infelicitous in the given context for the same reason that (15b) is: the  $CF_q$  inference is triggered in the normal fashion, but contradicts with A's statement. (Note: there may be some concern here that because the consequents in B/B' are distinct (there is a word missing in B'), we may not be licensed to compare their potential  $CF_q$  inferences; this issue is addressed in chapter 3).

Although (28) and (29) show that there is a special role for the lexical items 'also' and 'still' in cancelling  $CF_q$ , they are not representative for the range of contexts in which this cancellation is possible. It turns out that the presence of 'also' or 'still' is neither a necessary nor a sufficient condition for the cancellation of  $CF_q$ . It is not sufficient, because there are subjunctive conditionals that have 'also' in their consequent, but do not cancel  $CF_q$ :

(30) A: John met Mary yesterday.

B: If John had gone to the party, he would also have met LINDA.

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<sup>15</sup>There appears to be a lot of disagreement among English speakers about whether B's utterance should say "on time" or "in time". For (29) I will stick to the variant with "in time" as Declerck and Reed (2001: 266) have it, but of course this issue is completely irrelevant to the point these data are making.

Although the underlined conditional in (30) appears to have the same structure as the one in (28), here we infer that John did not meet Linda, hence  $CF_q$  is not cancelled but triggered in the normal fashion. The existence of this contrast is an important and novel observation, and before I turn to the analysis of the phenomenon of cancellation of  $CF_q$  (beginning in chapter 4), I will first discuss in detail the difference between (28) and (30) (in chapter 3), as this pertains to the empirical question of when  $CF_q$  is cancelled.

The same point can be made for ‘still’. Whereas the presence of ‘still’ in (29B) results in cancelling  $CF_q$ , no such effect is found in (31):

(31) A: John had been singing for an hour when someone rang at the door, and he stopped.

B: If John hadn’t heard the doorbell, he would still have been singing.

Here we infer that John is not singing anymore, which is the regular  $CF_q$  inference. The pair (29)/(31) thus illustrates the same contrast as (28)/(30) in that both examples have the word ‘still’ in their consequent, but  $CF_q$  is cancelled in (29) and not in (31).

**Other cancellation contexts** The presence of ‘also’ or ‘still’ is also not a necessary condition for  $CF_q$ -cancellation. This is shown by the existence of other types of contexts in which  $CF_q$  is cancelled. I will present four such cases here. While some of these have been discussed in previous literature for reasons other than their behavior with respect to  $CF_q$ , as far as I know none of them have been recognized as  $CF_q$ -cancellation contexts before.

The first case is a so called ‘listing context’. Listing a number of constituents comes with a typical intonation pattern in which every listed item has a ‘high plateau’ intonation (what this means is discussed in more detail in chapter 4), as in (32).

(32) I like lots of people: I like John, and Bill, and Mary, and Peter, ...

The three dots are meant to indicate that this is an open-ended list, meaning that the pitch contour does not go down at the last item ‘Peter’, and there is no inference that these four people are the only people the speaker likes. We can also have such a listing context in which antecedents of

a conditional are being listed. Imagine that speaker A went outside and saw a falling star. She is under the impression that she was very lucky to go outside at just the right moment to see the falling star. However, unbeknown to A, there was in fact a meteoric shower this evening, which causes the following response by speaker B:

(33) A: I went outside at 10.22pm, and I saw a falling star!

B: Well, that's not so special. If you had gone outside at 9.41pm, you'd have seen a falling star, if you had gone outside at 9.54pm, you'd have seen a falling star, if you had gone outside at 10.40pm, you'd have seen a falling star, ... There were lots of falling stars tonight.

This is admittedly a somewhat wordy utterance, but the point is that B's utterance is perfectly felicitous despite the fact that the consequents of the listed subjunctive conditionals are true. Hence it constitutes a  $CF_q$ -cancellation context.

For the second case, consider a scenario in which John and his friends schedule a meeting at the peak of rush hour. Despite this, John arrives on time, because he took the subway rather than the car. Speaker A is interested in the punctuality of different means of transport.

(34) [context: John took the subway and was on time]

A: If John had taken the train, would he have been on time?

B: Yes, if John had taken the train, he would have been on time.

In this context B's answer is felicitous even though it was in fact true that John was on time.

The third case of  $CF_q$ -cancellation contexts are so-called *semifactual conditionals* (to be discussed further in sections 6.1 and 7.3.1). An example due to Bennett (1982) is given in (35):

(35) [context: one is standing in front of a broken bridge]

Even if the bridge were standing, I wouldn't cross. (Bennett 1982)

Semifactuals often (but not always) begin with 'even if', and are special in that they convey the truth of their consequent. So (35) conveys that I wouldn't cross under any circumstance. This

property of semifactuals can also be phrased as the lack of a  $CF_q$  inference: semifactuals are subjunctive conditionals that are felicitous when  $q$  is true in the actual world.

Finally, another type of conditional in which the truth of the consequent is conveyed is a biscuit conditional (recall section 1.1, and to be discussed further in section 6.1). Although most biscuit conditionals discussed in the literature are indicative, there exist subjunctive biscuit conditionals (cf. Swanson 2013):

(36) A: I am not hungry.

B: That's good, but rest assured that if you had been hungry, there would have been biscuits in the cupboard.

Here, again, we do not infer that there are no biscuits in the cupboard, showing that  $CF_q$  is not triggered.

It is not quite clear at this stage what sets the last four  $CF_q$ -cancellation contexts presented here apart from regular cases such as (14) in which  $CF_q$  is generated, other than that they come with a 'special' context and/or intonation. When we introduce theoretical tools to talk about the structure of discourse and the role of intonation in more detail, we are able to obtain a better characterization of this class of  $CF_q$ -cancellation contexts. Then we will also see that these four contexts do not make up an absolutely exhaustive list, although the ones mentioned here are representative examples of the most important cases.

In conclusion, the puzzle that arises is that we have a seemingly very heterogeneous class of contexts that cancel  $CF_q$ . For reasons of exposition and ease of reference, throughout the dissertation I will maintain the informal threeway division in which I presented  $CF_q$ -cancellation contexts in this section:

1. some but not all conditionals that include 'also' in their consequent;
2. some but not all conditionals that include 'still' in their consequent;
3. a class of conditionals for which at this point we can't give a precise characterization, other

than that they have a ‘special’ context or intonation, and include listing contexts, contexts like (34), semifactuals and biscuit conditionals.

I will start with class 1 in chapter 3, and cover the empirical question about which instances of ‘also’ do and do not cancel  $CF_q$  in detail. It will turn out that the main difference between (28) and (30) has to do with how ‘also’ associates with focus. This difference will then be the starting point of the analysis, by studying the relation between focus association and discourse structure in chapter 4. In the course of this analysis that is laid out over chapters 4 to 6, we will develop the tools to analyze and identify the contexts in class 3. Class 2 introduces some additional puzzles, which I will postpone until chapter 7.

### 3 $CF_q$ -cancellation with ‘also’

In the previous chapter, I presented data that show that some but not all instances of ‘also’ in the consequent of a subjunctive conditional have the effect of cancelling  $CF_q$ . The crucial contrast is repeated here:

(37) A: John is very rich and his wealth has gotten him quite a few friends. (=28))

B: Yes, but if he had been nice he would **ALSO** have had friends.

B': #Yes, but if he had been nice he would have had friends.

↳  $CF_q$  **cancelled** in B

(38) A: John met Mary yesterday. (=30))

B: If John had gone to the party, he would also have met **LINDA**.

↳  $CF_q$  **not cancelled** in B

In this chapter I will formulate what empirically sets conditionals as in (37) apart from conditionals as in (38), by investigating some additional relevant data. What can already be seen in the two examples above, is that focus plays an important role (indicated by capital letters): in (37), the focus particle ‘also’ is stressed, while in (38) ‘also’ is not stressed. After further investigation of this role of focus, I will reach the conclusion that whether or not the presence of ‘also’ in the consequent of a subjunctive conditional has the effect of cancelling  $CF_q$  depends on how ‘also’ associates with focus. This novel finding thus establishes a surprising link between counterfactual inferences and focus association, for which a theoretical explanation will be given in the later chapters of this dissertation.<sup>16</sup>

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<sup>16</sup>Note that this type of focus-sensitivity is different from the sort of focus-sensitivity that has been discussed in relation to conditionals in so-called ‘Dretske-counterfactuals’ (Dretske 1972: 432, see also Ogihara 2000).

- (i) a. If Clyde hadn’t **MARRIED** Bertha, he would not have been eligible for the inheritance.  
b. If Clyde hadn’t married **BERTHA**, he would not have been eligible for the inheritance.

These sentences can have a different truth value depending on whether the eligibility of the inheritance depends on marrying some person or other, or on marrying Bertha in particular. The focus-sensitivity I describe here is not truth-conditional, but relates to whether or not the counterfactual inference of the consequent gets cancelled.

In addition to the contrast between (37B) and (38B), there is also a contrast between (37B) and (37B'): B' is infelicitous because the context makes the proposition that John has friends true. This second contrast suggests that the presence of 'also' in the B utterance is responsible for the cancellation of  $CF_q$ . This, however, requires some further discussion, as a rather subtle point can be made here.<sup>17</sup> We are comparing  $CF_q$  for utterances B and B', but these have syntactically distinct consequents ('also' is present in B, but not in B'). Therefore, in principle, we expect distinct  $CF_q$ 's for B and B' (which one might write as  $CF_{q1}$  and  $CF_{q2}$ , respectively). For this reason, so the objection goes, the pair (37B/B') is not a proper minimal pair. In other words, because 'also' is syntactically present inside the consequent, it is not possible to test the effect that leaving out 'also' has on  $CF_q$ , because leaving it out will change  $q$  (and hence  $CF_q$ ).

Note that this objection is based on the assumption that the syntactic differences of the consequents of (37B) and (37B') (i.e. the presence vs. absence of stressed 'ALSO') results in a difference in interpretation of those consequents. I will argue against this point.

(39) Objection: The consequents of the conditional utterances in (37B), (37B') are different. Hence they give rise to distinct  $CF_{q1}$  and  $CF_{q2}$ , which we cannot compare directly.

Response: Despite its surface form, 'also' is not part of the proposition expressed by the consequent in (37B), and hence (37B) and (37B') do give rise to the same  $CF_q$ .

I will return to the objection and my response at the end of section 3.2.

**Outline of the chapter** Beginning in section 3.1, I will first set up a context in which the contrast we saw in (37)/(38) can be constructed in one and the same context. This makes it easier to compare the two types of conditionals that contain 'also' in their consequent. I will argue that whenever 'also' focus-associates with material outside its own clause (I call this *non-local 'also'*), it behaves

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<sup>17</sup>Thanks to Yael Sharvit (p.c.) for pushing me on this point.



like (37) and we find cancellation of  $CF_q$ . When ‘also’ associates with material inside its own (consequent) clause (I call this *local ‘also’*), it behaves like (38) and we do not find cancellation of  $CF_q$ . In section 3.2 I show that the local/non-local distinction correlates with the syntactic position of ‘also’ within the conditional. In particular I show that non-local ‘also’ is interpreted outside the consequent clause (this answers the worry in (39)).

The puzzle to be solved in this dissertation concerns non-local ‘also’, as it is the type of ‘also’ that leads to cancellation of  $CF_q$ . However, we should make sure that the behavior of local ‘also’ is correctly captured by existing theories of conditionals and additive particles. The last part of this chapter, section 3.3, is devoted to local ‘also’.

### 3.1 Local and non-local ‘also’

Consider the following scenario:

- (40) In a television game show, a participant will open and win the contents of exactly one of the following five boxes, the contents of which are unknown to the participant.

Box A	\$100
Box B	\$100 and a laptop
Box C	empty
Box D	\$100
Box E	a laptop

Suppose that Mary participates in the game show described in (40) and picks box A. When the boxes are all opened afterwards, the following two statements are felicitous:

- (41) [context: Mary picked box A, so she won \$100.]
- a. If Mary had picked box B, she would also have won a LAPTOP.
  - b. If Mary had picked box D, she would ALSO have won \$100.

I will show that this pair constitutes another instantiation of the contrast in (37)/(38): in (41b)  $CF_q$  is cancelled, but in (41a)  $CF_q$  is not cancelled. I will argue for this point in a more careful way than I have done for (37)/(38) above, in order to take away any potential skepticism about the nature of this crucial empirical contrast.

The differences in intonation between (41a) and (41b), indicated here schematically by marking focal stress with capital letters, are essential in assessing the nature of these examples. Because the complicated context and intonation differences in (41) may make judgments about  $CF_q$  a little difficult, it will be helpful to have an informal test to find out what the content of  $CF_q$  is.<sup>18</sup>

Recall that counterfactual inferences ( $CF_p$  and  $CF_q$ ) are suppositions that a certain proposition is false. In general, an interlocutor can “reconfirm” a positive propositional supposition of the form  $r$  in a previous utterance by an echoic yes-no question of the form “So  $r$ ?”, and a negative supposition  $\neg s$  by a question of the form “So not  $s$ ?”. The other speaker then answers by ‘yes’ or ‘no’, respectively (where ‘no’ serves to confirm the negative question, see e.g. [Holmberg 2012](#)).

- |      |    |   |    |  |
|------|----|---|----|--|
| (42) | a. | A: [some utterance that<br>implicates $r$ ] | b. | A: [some utterance that<br>implicates $\neg s$ ] |
|      |    | B: So $r$ ?                                 |    | B: So not $s$ ?                                  |
|      |    | A: Yes.                                     |    | A: No.   |

This makes a useful diagnostic because  $r$  (and  $s$ ) in B’s question must match with A’s first utterance. If we are not sure about the content of A’s implicature we can thus use our intuitions regarding a natural confirming question by B, and see what the content of that question is.

Applied to a standard counterfactual example as in (14), this leads to the following exchange:

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<sup>18</sup>It is possible to construct a sentence that forms an even closer minimal pair with (41a):

- (i) [context: Mary picked box E, so she won a laptop]  
If Mary had picked box B, she would ALSO have won a laptop.

For reasons of exposition, however, I will use (41b) in the discussion below, so that the context of utterance in (41a/b) remains constant.

(43) A: If I had taken the bus, I would have been on time.

B: So you weren't on time?

A: No.

Even though it is perhaps somewhat superfluous on the part of B, this is a perfectly natural dialogue. Because B's question is the natural one (rather than, say, #'So you weren't late?'), this test tells us that  $CF_q$  consists of 'I was not on time'.<sup>19</sup> Our judgment that B's question is the natural one to reconfirm  $CF_q$  thus gives us an informal, pre-theoretic way of determining the precise content of  $CF_q$ . That the answer is 'no' (confirming the negative question) confirms that  $CF_q$  is indeed attested and not cancelled.

When we apply this to (41a), we get the following:

(44) [context: Mary picked Box A, so she won \$100.]

A: If Mary had picked box B, she would also have won a LAPTOP. (=41a)

B: So she didn't also win a LAPTOP?

A: No.

B's question contains the word 'also' which comes with a requirement, namely that speaker B knows that Mary won something other than a laptop (for example one can't ask 'Did you also invite BILL?' if it is not known that you invited someone other than Bill). B's question in (44) is well-formed because that requirement is met: the context tells us that Mary won \$100. Because A's answer is 'no', confirming B's negative question, we conclude that  $CF_q$  is attested and not cancelled. We thus have an example of a subjunctive conditional with 'also' in the consequent that does *not* cancel  $CF_q$ .

When we turn to (41b) we see that a question similar to the one in (44) (noted below as  $B_1$ ) is bad, regardless of whether 'also' is stressed or not:

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<sup>19</sup>We can safely ignore for now the difference in tense morphology between A's utterance and B's question. The problem of the interpretation of tense in counterfactuals is a complicated matter that I will return to it in detail in chapters 5 and 7.

(45) [context: Mary picked Box A, so she won \$100.]

A: If Mary had picked box D, she would ALSO have won \$100. (=41b))

B<sub>1</sub>: #So she didn't also win \$100? (# for any intonation)

B<sub>2</sub>: So she DID win \$100?

A: Yes.

The reason that B<sub>1</sub> is bad is that the requirement for 'also' is not met: Mary did not win something other than \$100 (this would be similar to responding to 'I invited Bill' with the question #'Did you also invite Bill?'). A *good* question to follow up (41b) would be to leave out 'also' from (45), as in B<sub>2</sub>: *So she DID win \$100?*. That the answer to this positive question is 'yes' (the context makes clear that Mary did win \$100), shows that CF<sub>q</sub> is cancelled in (41b).

The second piece of information that we can get from the tests in (44) and (45) is the content of CF<sub>q</sub>: in (44) it is possible to include 'also', in (45) it is not. This shows that there is an important difference in the interpretation of 'also' in both cases. It is also a first suggestion in the direction of the claim that I will be making later on, namely that in (41b), 'also' is interpreted in a different syntactic position than in (41a). To see what that means precisely, we need to consider the syntactic structure of the conditional sentences in question (section 3.2), but before doing that I present three linguistic properties to tell the cases in (41) apart (besides the CF<sub>q</sub> behavior already discussed).

**Linguistic properties of (41a) and (41b)** The cases in (41a) and (41b) form natural classes that can be distinguished on the basis of three criteria. The first, and easiest, property is that 'also' is required in (41b) (compare (37B')), but is optional in (41a). Leaving out 'also' in (41a) of course leads to some change in meaning, as the semantic contribution of 'also' is no longer present, but by 'optional' I mean here that leaving it out does not lead to infelicity. Why exactly 'also' cannot be left out is a complicated issue, and I will come back to it in chapter 4. The second and third criterion are a bit more complicated, and I will call them the 'interpretation criterion' and the 'intonation criterion', respectively.

**Interpretation criterion** The interpretation criterion deals with the *associate* of ‘also’. This is an important theoretical concept that will feature prominently in chapter 4, but at this point it is enough to have an informal grasp of it. Recall from our previous discussion that ‘also’ comes with a requirement. This requirement can be different for different sentences with ‘also’, even if they have the exact same words.

- (46) a. [I invited Mary to my birthday party, and] I also invited BILL to my birthday party.  
b. [I invited Bill to my wedding, and] I also invited Bill to my BIRTHDAY party.

In (46a) it is required that I invited somebody else than Bill to my birthday party. In (46b) the requirement is that I invited Bill to something else than my birthday party. While the requirements are different, we can generalize by saying that they both require that the sentence be true for an alternative to some entity (an alternative to Bill, and an alternative to my birthday party, respectively). The constituent in the sentence that represents the entity for which alternatives are required is called the *associate* of ‘also’:<sup>20</sup> in (46a) the associate is ‘Bill’, in (46b) it is ‘to my birthday party’. As we can see in (46), the associate of ‘also’ in each case is focused, i.e. marked phonologically with a pitch accent. This is why particles like ‘also’ are said to ‘associate with focus’, and are called *focus particles*.

The interpretation criterion is based on the *location* of the associate of ‘also’ in the conditional sentence. In (41a) the associate of ‘also’ is ‘a laptop’ since that sentence is only felicitous when Mary won some other prize than a laptop. The relevant alternatives are thus different prizes besides a laptop. In different contexts (that also come with different intonation patterns), other constituents inside the consequent are the associate of ‘also’:

- (47) a. [Mary picked box A, so she won \$100.] If Mary had picked box B, she would also have won a LAPTOP. (=copy of (41a))  
associate = ‘a laptop’

---

<sup>20</sup>I use ‘associate’ and ‘focus associate’ interchangeably throughout the text.

- b. [If Mary had done X, she would not only have been LENT a laptop,] Mary would also have WON a laptop.  
 associate = ‘won’
- c. [Bill just won a laptop]  
 If Mary had opened Box E, MARY would ALSO have won a laptop.  
 associate = ‘Mary’

The crucial point is that none of these subjunctive conditionals with ‘also’ in the consequent cancels  $CF_q$ : from (47b) and (47c) we infer that Mary did not actually win a laptop (applying the echo question test discussed above further confirms these intuitions). So all conditionals in (47) behave identically with respect to  $CF_q$ , and thus pattern with (41a): in all examples in (47), one infers that the consequent is false.

We thus see that in cases like (41a) the associate of ‘also’ is **inside** the consequent, but in (41b) it is **outside** the consequent. Indeed, sentence (41b) does not convey any of the meanings in (47). What ‘also’ does there is compare different ways to win \$100: by opening Box A, by opening Box B, by opening Box D, etc. The alternatives are based on the antecedent, so the associate of ‘also’ is not one of the constituents inside the consequent, but is rather located in the antecedent. The interpretation criterion uses our intuition about the meaning contribution of ‘also’ in the sentence: does ‘also’ compare different ways for the realization of the consequent (as in (41b)), or does it compare winners, prizes, etc. as in (47)? Because of the difference in association, I will call cases as in (47) **local** instances of ‘also’ because they associate with material in the same clause. ‘Also’ in (41b) is **non-local** because ‘also’ in the consequent associates with material in a different clause. Note that in this definition of non-local ‘also’, “different clause” does not necessarily mean “antecedent clause”. However, in practice, non-local ‘also’ will always associate with material inside the antecedent, simply because the other options are rather limited (Jessica Rett (p.c.) observes that non-local ‘also’ may associate just with the complementizer ‘if’, although it is somewhat difficult to imagine what the focus alternatives for ‘if’ could be in an additive context).

**Intonation criterion** The third criterion, closely related to the interpretation criterion, is intonation. We see that (41a) follows the canonical cases in (46) in that the associate of ‘also’ is focused, and ‘also’ is not focused itself. In (41b), however, ‘also’ is stressed. This prosodic property is a stable characteristic of non-local ‘also’ and can be identified easily in phonetic recordings of such sentences. Figure 1 displays a pitch contour of a sentence containing non-local ‘also’, in which the high pitch accent on ‘also’ (marked as L+H\* in ToBI) is clearly visible (Appendix B contains pitch contour diagrams for more recordings).

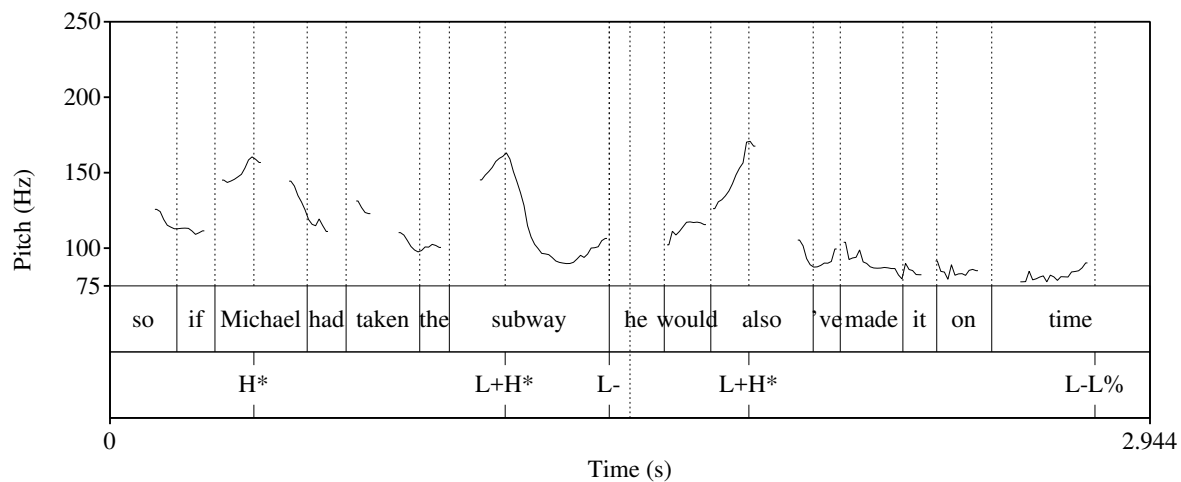


Figure 1. Pitch contour for non-local ‘also’

This may be taken to suggest that ‘also’ in the consequent of a conditional cancels  $CF_q$  if and only if it is stressed. Unfortunately the criterion is not quite as simple as that, because of cases such as (47c): here ‘also’ is stressed (along with its associate), yet it does not cancel  $CF_q$ , so belongs to the category of (41a). This has to do with the fact that ‘also’ here linearly follows its associate (rather than preceding it as in (47a,b)). The link between the associate of ‘also’ and the intonation contour of the sentence will turn out to be of importance in my analysis, and will therefore be discussed in more detail in chapter 4. The conclusion is that intonation is a useful way to help identifying the associate of ‘also’, but that looking only at the stress on ‘also’ itself is not a reliable way to distinguish between (41a) and (41b). Due to the complicated relation between sentence structure and prosodic realization in English, it is always best to use the intonation criterion in combination

with the interpretation criterion.

The three criteria are summarized in Table 2.

	local ‘also’ [class of (41a)]	non-local ‘also’ [class of (41b)]
optionality (does leaving out ‘also’ lead to infelicity?)	no (optional)	yes (non-optional)
interpretation criterion (where is the associate of ‘also’?)	in the consequent	in the antecedent
intonation criterion (where is the focus?)	on the associate of ‘also’	on ‘also’ <sup>†</sup>
CF <sub>q</sub>	not cancelled	cancelled

<sup>†</sup> ‘Also’ is also stressed when it follows a local associate, as in (47c).

Table 2. Criteria for distinguishing between local and non-local ‘also’

I will finish this section by returning to our original examples (37) and (38) and illustrate how the criteria from Table 2 apply to them. Beginning with (37), we find that one cannot leave out ‘also’ (see (37B’)). Second, the associate of ‘also’ is located in the antecedent: the alternatives being compared are reasons for John’s having friends (that John is very rich, that John is nice, ...). Finally, stress falls on ‘also’. So all three criteria indicate that (37) features non-local ‘also’, and indeed CF<sub>q</sub> is cancelled.

Turning to (38), we see that ‘also’ may be left out. The associate of ‘also’ is ‘Linda’: the alternatives that are being compared here are different people that John met (Mary, Linda, ...). Finally, stress does not go to ‘also’, but to its associate ‘Linda’. Hence all three criteria indicate that (38) contains local ‘also’, and indeed CF<sub>q</sub> is not cancelled.



### Side note

One may wonder if local and non-local ‘also’ can co-occur in a single conditional sentence.<sup>21</sup> Recall that there is no semantic difference between local and non-local ‘also’: the only difference is the location of their focus associate. Hence, if conditionals that have both types of ‘also’ in the same sentence exist at all, they should be *multiple focus* constructions (Taglicht 1984: §7; Krifka 1992; Gast 2006; Wagner 2012: §2). Although I believe there is in principle no problem with presupposing alternatives to both a cause and an outcome, there are general (syntactic) restrictions against having a multiple focus construction with two occurrences of ‘also’ (cf. observations about double ‘only’ in Taglicht 1984: 168).

Here is an attempt to construct a simple sentence with nested occurrences of ‘also’:

(48) [Mary<sub>i</sub> speaks English, and also French. John speaks German<sub>j</sub>.]

??John ALSO<sub>i</sub> also<sub>j</sub> speaks French.



The reading that John, in addition to Mary, is someone who speaks French in addition to some other language, is hard to get.

‘Also’ may also associate with a *complex focus*, as in the following example in which ‘Mary’ and ‘Peter’ form a complex focus associate (cf. Krifka 1992):

(49) John introduced Bill to Sue, and he also introduced MARY<sub>F1</sub> to PETER<sub>F2</sub>.

Complex focus constructions with ‘also’ in conditionals are not possible because we will see in chapter 4 that the restrictions on non-local ‘also’ are stricter than those for local ‘also’ (following Krifka (1999: §2.3); see discussion in my chapter 4 and my footnote 38).

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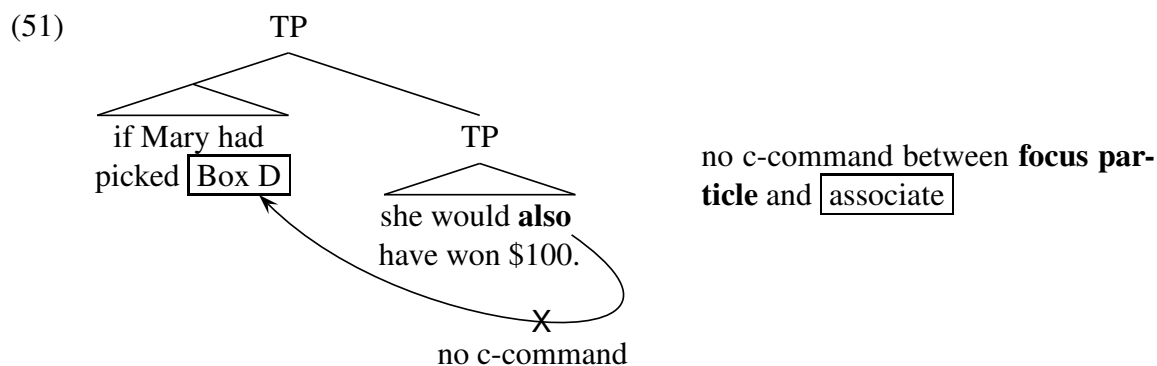
<sup>21</sup>Thanks to Jessica Rett (p.c.) for raising this question.

### 3.2 The syntax of local and non-local ‘also’

A theoretical problem that relates to the idea that non-local ‘also’ associates with material in the antecedent in sentence-initial *if*-clauses, is that it violates a commonly held assumption regarding the structural relation between ‘also’ and its associate:

- (50) *C-command criterion for ‘also’* (e.g. König 1991; Büring and Hartmann 2001)  
 ‘also’ must c-command its associate

To see how on the surface structure this constraint is violated, we need to make some assumptions with respect to the syntactic structure of conditionals. As basic assumptions, I adopt the view that a conditional sentence is a biclausal structure in which the consequent is the main clause, and the *if*-clause functions as an adjunct (see e.g. Bhatt and Pancheva 2006 for an overview). Since initial *if*-clauses appear before the matrix subject, they adjoin at the TP level or somewhere higher in the functional hierarchy. Even with this skeletal syntactic structure, it is clear that when the *if*-clause is sentence-initial, on the surface there is no c-command from ‘also’ to the antecedent or material inside it, so there is indeed a violation of (50):



I will argue that non-local ‘also’ and the antecedent of the conditional will at some point of the derivation be in a syntactic configuration in which the required c-command relation holds.

- (52) *Wide scope hypothesis*

At some point in the syntactic derivation, non-local ‘also’ c-commands its associate in the antecedent.

This could for example happen when ‘also’ moves to a position higher than the antecedent, or when the antecedent moves below ‘also’. Before deciding between these two alternatives, I will first consider a somewhat simpler case, namely conditionals that have their *if*-clause in sentence-final position.

An important observation is that in sentence-final *if*-clauses, no violation of (50) occurs. To see this, two additional syntactic assumptions need to be made: one regarding the syntactic position of ‘also’, and one regarding the syntactic structure of sentence-final *if*-clauses.

**The syntactic position of ‘also’** Focus particles like ‘also’ are traditionally analyzed as adverbial items (e.g. König 1991). The typical position of ‘also’, and also the one we see in the conditional data we have been considering, is after the modal verb or first auxiliary but before the main verb. This groups ‘also’ with VP-adverbs (Jackendoff 1972), a class of adverbs that attaches to VP, more precisely that left- or right-adjoins to a VP projection (see e.g. Potsdam 1998).

I thus assume that ‘also’ is a VP-adjunct, putting it in parallel with Rullmann’s (2003: §4.2) analysis of focus particles ‘too’ and ‘either’ as VP-adjuncts (see also Sudhoff 2010: 86ff.), with the difference that ‘also’ may also right-adjoin to the VP.<sup>22</sup>

**Sentence-final *if* clauses** As for the syntactic position of sentence-final *if*-clauses, it has been argued on the basis of Condition C data that they adjoin somewhere above the direct object, but below the subject of the main clause. I will follow a number of proposals in that they adjoin at the VP-level (see Iatridou 1991; Haegeman 2003; Bhatt and Pancheva 2006; I will not be concerned

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<sup>22</sup>I do not claim that this covers all cases of the use of ‘also’ in English. The syntax of adverbs is notoriously difficult, and there exists a lot of inter-speaker variation with respect to their placement. Some speakers allow either a higher position of ‘also’ (before the modal, e.g. *John also would have...*) or a lower position of ‘also’, appearing between the verb and its complement as in (i):

- (i) I’m anxious to hear also what Peter has to say. (Taglicht 1984: 156)

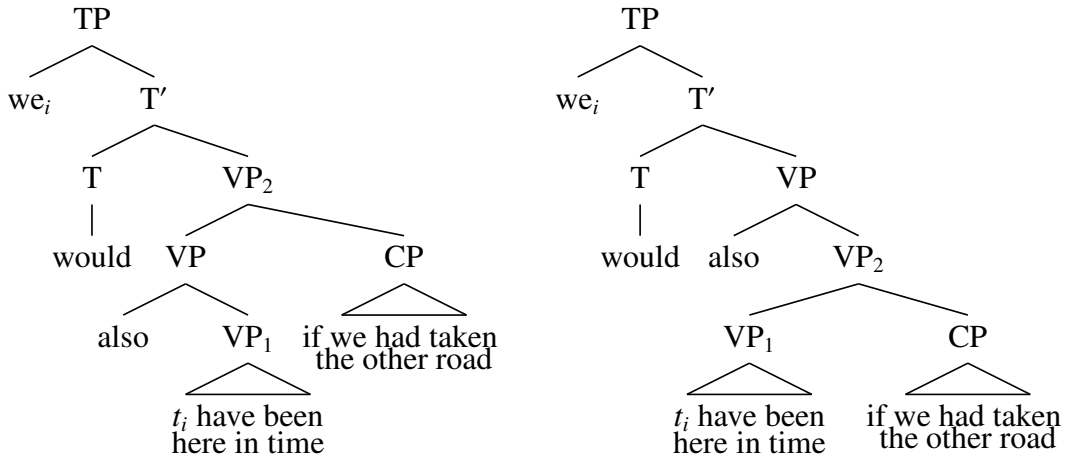
For the analysis of my conditional data, as we will see, all that matters is that ‘also’ adjoins *no lower* than VP, because a higher position of ‘also’ does not affect the c-command relationship with its associate. A sub-VP position of ‘also’ in conditionals does not allow the non-local interpretation we are seeking to analyze:

- (ii) \*If Mary had opened box D, she would have won ALSO<sub>non-local</sub> \$100.

here with further syntactic details such as the interaction with negation).

We have two VP-adjuncts (the *if*-clause and ‘also’), so they can attach to the main VP in two different structures, and I claim that this is the source for the local / non-local ‘also’ difference in sentence-final conditionals.

- (53) a. Sentence-final *if*-clause; local ‘also’      b. Sentence-final *if*-clause; non-local ‘also’



So the local/non-local difference comes out as a difference in adjunction height. When ‘also’ adjoins to VP<sub>1</sub> (the lower main clause VP, (53a)) it cannot scope over the antecedent, but only over VP<sub>1</sub>. This allows for interpretations in which the associate of ‘also’ is some constituent inside the consequent (such as the ones in (47)), hence representing local ‘also’.<sup>23</sup> On the other hand, when ‘also’ adjoins to VP<sub>2</sub> (the higher VP which is itself adjoined with the *if*-clause, (53b)), ‘also’ c-commands the material inside the antecedent, allowing a non-local interpretation in which the alternatives are different causes for *q*. In both cases, the c-command requirement (50) is respected.

We see that by adopting some standard syntactic assumptions we have a straightforward structural representation of the local/non-local distinction for sentence-final *if*-clauses that satisfies (50). Now we can return to our original problem: the violation of (50) in sentence-initial *if*-clauses.

**Back to sentence-initial *if*** The problem we are dealing with is that at the surface structure, non-local ‘also’ associates with material inside the antecedent, which is a violation of the commonly

<sup>23</sup>Case (47c) is again a special case. How ‘also’ c-commands the subject ‘Mary’ in (47c) will be discussed below.

held requirement that there must be a c-command relation between ‘also’ and its associate, as specified in (50). In order to solve this problem we need to show that at some point in the derivation, ‘also’ and its associate were in the required structural configuration. To do so, there are two options available:

- (54) a. Option 1: Movement of ‘also’ to a c-command position over the antecedent; no movement of the *if*-clause  
 [TP ALSO<sub>i</sub> [if we had taken the other road ] [TP we would *t<sub>i</sub>* have been here in time ] ]
- b. Option 2: Reconstruction of the *if*-clause to the sentence-final position; no movement of ‘also’  
 [TP [if we had taken the other road]<sub>j</sub> [TP we would [VP also [VP have been here in time ] *t<sub>j</sub>* ] ] ]

For Option 1, to (covertly) move ‘also’ to some higher position such that it c-commands the antecedent, there is no independent motivation. Furthermore, it would predict, incorrectly, that these sentences are equivalent with ‘also if’ conditionals.

(55) Also if we had taken the other road, we would have been here in time.

Many native speakers that I polled about this sentence reported that (55) is less natural than when ‘also’ appears in its normal consequent-internal position (i.e. (53b)). Moreover, those speakers that find (55) acceptable, suggest there is a meaning difference with (53b), although I have not been able to clearly identify what this difference amounts to.

Option 2 is more promising, as it effectively reduces the problem to the case of sentence-final *if*-clauses, which we have already seen do not violate (50). There is independent evidence that sentence-initial *if*-clauses are indeed derived by movement from an underlying sentence-final position. The related syntactic issues, however, are complicated, and both evidence in favor for the account and against it have been adduced. The following summary is based on [Bhatt and Pancheva \(2006\)](#).

Bhatt and Pancheva favorably argue for a movement analysis in which the *if*-clause reconstructs in order to set up the required binding relationship between ‘John’ and the reflexive in (56a), and between the quantifier and the bound variable in (56b).

- (56) a. If pictures of himself<sub>i</sub> are on sale, John<sub>i</sub> will be happy. (B&P 2006: 650)  
b. If her<sub>i</sub> child is late from school, every mother<sub>i</sub> is upset.

On the other hand, Condition C data such as the following suggest that at least some sentence-initial *if*-clauses do not reconstruct and are base-generated in the sentence-initial position:

- (57) a. \*She<sub>i</sub> yells at Bill if Mary<sub>i</sub> is hungry. (Bhatt and Pancheva 2006: 649)  
b. If Mary<sub>i</sub> is hungry, she<sub>i</sub> yells at Bill.

Despite potential problems with a reconstruction account such as (57), I will choose for Option 2, avoiding unmotivated movement of ‘also’. Additional considerations for favoring Option 2 are, first, that it gives an elegant solution to the problem of (50) by deriving sentence-initial *if*-clauses from a related structure (sentence-final *if*-clauses) that does not violate (50), second, the close similarity with the Bhatt and Pancheva data in (56) in which reconstruction sets up c-command relations that do not hold on the surface, and third, that it follows previously proposed solutions to similar problems with additive focus particles. To illustrate this last point, I will discuss some observations from Rullmann (2003).

Rullmann analyzes the focus particles ‘too’ and ‘either’, for example in sentences such as (58):

- (58) John [<sub>VP</sub> [<sub>VP</sub> lives in France ] too].  
(‘John’ is the associate of ‘too’)

If ‘too’ is assumed to be a VP adjunct, it does not c-command the subject of the sentence in its surface position, yielding a violation of (50) in the same way as our sentence-initial *if*-clauses do. Rullmann avoids such a violation by suggesting that the actual associate of the focus particle is not the subject ‘John’ but the movement trace of the subject inside the VP (assuming the VP-internal subject hypothesis), which is (inaudibly) focus-marked.

(59) [TP [John<sub>i</sub>] [VP [VP [<sub>F</sub>  $t_i$ ] lives in France ] too ] ]

( $t_i$  is the associate of ‘too’)

Now the associate of ‘too’ is inside the c-command domain of the focus particle, taking away the violation of (50). So [Rullmann](#) solves the problem in (58) not by covert movement of ‘too’, but by reinterpreting the syntactic derivation of its associate, just as I have proposed for my conditional data.

In (59), a phonologically empty element is focus-marked, which may be considered a problem, one that would apply to my proposal as well. This alleged problem, however, is commonly addressed in the literature. Many papers that deal with focus particles have a section devoted to it, in which it is most often argued away ([Krifka 1999](#), §2.6, [Rullmann 2003](#), §5.5, [Ippolito 2003](#): 9, all referring back to a footnote in [Heim 1992](#): 215n13), though it has also been pointed out that the ability to associate with phonologically empty material differs from particle to particle ([Beaver and Clark 2008](#)). I conclude by citing some more examples from [Rullmann \(2003\)](#) that show how a focus particle associates with a trace of a movement operation out of its c-command domain.

(60) a. [The STUDENTS]<sub>i</sub>, she wanted nobody to invite  $t_i$  EITHER. (p. 382)

b. [The STUDENTS]<sub>i</sub> were claimed not to have been invited  $t_i$  EITHER.

c. #The STUDENTS think she wanted nobody to invite Mary EITHER.

In these cases, topicalization and passivization front a constituent which then ends up outside the c-command domain of ‘either’. By allowing that the focus particle associates with the trace, (50) can be maintained. Example (60c) shows that a similar surface form without a movement trace is not allowed.

**Other operators** As a final justification for my approach, I show that ‘also’ is by no means the only operator that syntactically appears inside the consequent but may take scope over the antecedent. Example (61) lists three examples from previous literature (see [Haegeman 2003](#) for additional examples):

- (61) a. [John sometimes works best] [if there is a lot of pressure.] (Haegeman 2003: 321)  
 b. [We will only play soccer] [if the sun is shining.] (von Stechow 1997: 7)  
 c. [context: We have marbles in the following distribution:] (Yalcin 2012)

	blue	red	]
big	10	30	
small	50	10	

If the marble is big, then it's likely red.

The marble is not likely red.

↯ The marble is not big.

What all these have in common is that the underlined operator syntactically appears inside the consequent but appears to take scope over the conditional as a whole. In (61a) ‘sometimes’ doesn’t modify John’s working, but rather says that sometimes the conditional relationship holds. In (61b), the relevant reading is paraphrasable by ‘We play soccer only if the sun is shining’, taking the *if*-clause as associate of ‘only’. Finally, (61c) is a putative counterexample to Modus Tollens, to which one potential reply is that the adverb ‘likely’ takes wide scope over the conditional (see Yalcin 2012 for discussion).

I will conclude this section by comparing my cases containing ‘also’ with the apparently similar example in (61b). There is one crucial difference, however, between ‘also’ and ‘only’ in this respect: (61b) cannot be reversed, while the conditionals with non-local ‘also’ can (repeated in (63)).

- (62) a. We only play soccer if the sun is shining.  
 b. \*If the sun is shining, we ONLY play soccer.

- (63) a. We would ALSO have been here in time if you had taken the other road.  
 b. If we had taken the other road, we would ALSO have been here in time.



This means that my analysis for ‘also’ cannot be applied to ‘only’, as it would incorrectly allow (62b). Why can’t the sentence-final *if*-clause be fronted, i.e. why can’t (62b) be derived from (62a)? I would like to suggest that the unavailability of preposing is an instance of more general restrictions on extraction of the associate of ‘only’ (see [Beaver and Clark 2003](#), §4.2; [2008](#), §7). For example, ‘only’ does not allow topicalization of its associate, in contrast to ‘also’ in the examples in (60) as well as (64a) below:

- (64) a. Mary<sub>i</sub>, I also like t<sub>i</sub>.  
b. \*Mary<sub>i</sub>, I only like t<sub>i</sub>.

[Beaver and Clark \(2008: §7\)](#) present a whole range of additional extraction configurations that are not possible for ‘only’, including adverb preposing:

- (65) On Sunday, I thought you only went to the store. ([B&C 2008](#): 165)  
can’t mean: I thought you went to the store on Sunday and no other day.

I thus claim that the reason that the *if*-clause in (62a) cannot be fronted is an instance of the same constraint that rules out (65) (I refer the reader to [Beaver and Clark 2008: §7.4](#) for more details on their analysis of this constraint). Such constraints do not hold for ‘also’, which explains the contrast between ‘only’ and ‘also’ in this respect.

**Interim summary** I have presented a range of arguments in favor of an analysis in which the local/non-local distinction corresponds syntactically to a distinction with respect to the position where ‘also’ adjoins to the VP. In particular, this means that non-local ‘also’ takes wide scope over the antecedent, and is not part of the proposition of the consequent (see (53)). This answers the objection mentioned in the introduction of this chapter (see (39)) that the presence of non-local ‘also’ (as in (37B)) might contribute to the content of the proposition  $q$ , and hence  $CF_q$ . The syntactic analysis in this section shows that despite the surface form, non-local ‘also’ is interpreted in a position outside of the consequent. A second rebuttal of this objection will become clear in the next section. We will see that ‘also’ makes only a presuppositional contribution to the sentence

it appears in, i.e. ‘also  $\varphi$ ’ makes the same *assertion* as ‘ $\varphi$ ’ does. Since  $CF_q$  is a supposition concerning the assertion of  $q$ , and not the presupposition of  $q$ , adding ‘also’ to the consequent (which, again, is *not* what actually happens for non-local ‘also’, but this is a separate argument), will not affect the content of  $CF_q$ .

### 3.3 Derivation of local ‘also’: presupposition projection

Now that we have seen the syntactic differences between local and non-local ‘also’, I shall proceed to show that the interpretation of local ‘also’ is handled by existing theories. Note that because local ‘also’ does not cancel  $CF_q$ , and counterfactual conditionals with local ‘also’ are thus completely regular with respect to  $CF_q$ , we do not have to say anything about counterfactuality yet. Of course when I reach an explanation of how non-local ‘also’ cancels  $CF_q$ , I will make sure that the proposed solution does not overgeneralize in the sense that it also predicts that local ‘also’ cancels  $CF_q$ . All that needs to be shown at this point, then, is that existing theories on additive particles provide the correct meaning for local ‘also’.

Pending a more detailed investigation in chapter 4, I adopt a basic semantics for ‘also’, based on Heim’s (1992: 189) entry for ‘too’. ‘Also’ combines with a proposition  $\varphi$  that contains a focus marked constituent  $x$ . In standard terminology, e.g. Sæbø (2004),  $x$  is called the **associate** of ‘also’. Furthermore, there is a salient individual  $\alpha_i$  in the previous discourse that is co-indexed with ‘also’. This  $\alpha$  is called the **presupposed alternative** of ‘also’.

(66)  $\llbracket \text{also}_i \varphi[x_F] \rrbracket$  is defined when  $\alpha_i \neq x$  and  $\llbracket \varphi[\alpha_i] \rrbracket = 1$ .

When defined,  $\llbracket \text{also}_i \varphi \rrbracket = \llbracket \varphi \rrbracket$ .

(67) Example: I invited  $\text{Mary}_i$  to the party, and [I  $\text{also}_i$  invited  $[\text{Bill}]_F$  to the party] $_S$ .

associate of ‘also’: Bill

presupposed alternative of ‘also’: Mary

$S$  is defined because: Mary  $\neq$  Bill and  $\llbracket \text{I invited Mary to the party} \rrbracket = 1$

assertion of  $S$ : I invited Bill to the party

The definition in (66) assumes that ‘also’ is an *anaphoric* presupposition trigger, i.e.  $\alpha_i$  must be present in previous discourse, and is not existentially quantified. This is a standard assumption,<sup>24</sup> which is justified on the basis of examples such as (68) (due to Saul Kripke).

(68) John is having lunch in New York too.

If ‘too’ had an existential presupposition (i.e. there is someone else who is having lunch in New York), it would clearly be true since many people are having lunch in New York. However, without context, (68) is infelicitous: what ‘too’ needs is a contextually salient antecedent, such as ‘Mary’ in the sentence ‘Mary<sub>i</sub> is having lunch in New York’.

The semantic structure of (41a), repeated here, is thus as follows:

(69) [context: Mary picked box A, so she won \$100<sub>i</sub>].

If Mary had picked box B, she would also have won a LAPTOP.

semantic structure: if [Mary had picked box B] would [she has also<sub>i</sub> won a [laptop]<sub>F</sub>]

As for the semantics of conditionals, adopting the generic ‘universal force’ analysis as discussed in section 1.1 will suffice to make my point. Recall that it says that all *p*-worlds in some domain specified by *R* are *q*-worlds.

It will be helpful to consider separately the assertion and the presupposition in deriving (69). Computing the assertion is very straightforward, given that ‘also’ as defined in (66) only has a presuppositional contribution; its assertion is just that of its complement. Hence we find that the assertion of (69) is that of the conditional without ‘also’.

(70) When defined,  $\llbracket (69) \rrbracket(w) = 1$  iff

$\forall w' [(R(w, w') \wedge \text{Mary picked box B in } w') \rightarrow (\text{Mary won a laptop in } w')]$

(=  $\llbracket \text{If Mary had picked box B, she would have won a laptop} \rrbracket(w)$ )

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<sup>24</sup>This requirement is called ‘strong contextual felicity’ in [Tonhauser et al. \(2013\)](#), see there (p. 100ff) for further discussion.

The harder part is the question of what happens with the presupposition of ‘also’. Since ‘also’ in (69) is a presupposition trigger embedded inside the consequent, it instantiates a problem known in the literature as the *proviso problem* (section 3.3.1 below). There are in principle two options: the presupposition remains local, and forms a conditional presupposition, or the presupposition projects and forms a non-conditional presupposition.

- (71) a. non-conditional presupposition: Mary won  $\alpha_i$ ,  $\alpha_i \neq \text{laptop}$   
 b. conditional presupposition: if Mary had picked Box B, (Mary would have won  $\alpha_i$ ,  $\alpha_i \neq \text{laptop}$ )

Our intuitions on which of (71a) and (71b) is the actual presupposition of the conditional in (69) are not entirely clear. We will see that the reason for this is that two different constraints are playing a role in (69). I will first review the proviso problem in general, and then return to discussing the specific issues arising with additive particles in the consequent, as in (71).

### 3.3.1 The proviso problem

When the consequent  $q$  of a conditional carries a presupposition  $\pi$  (written  $q_\pi$ ), this presupposition may either remain ‘local’ and form a conditional presupposition ( $p \rightarrow q_\pi$  presupposes  $p \rightarrow \pi$ ) or project and form a non-conditional presupposition ( $p \rightarrow q_\pi$  presupposes  $\pi$ ) (e.g. Beaver 2001; van Rooij 2007; Romoli et al. 2011; Schlenker 2011; Chemla and Schlenker 2012; Lassiter 2012 among many more).

For example, our intuitions are that (72a) generates a non-conditional presupposition, whereas (72b) generates a conditional presupposition.

- (72) a. If John flies to Rome, his sister will pick him up at the airport.  
 non-conditional presupposition: John has a sister.  
 #conditional presupposition: If John flies to Rome, he has a sister

- b. If John is a scuba diver, he will bring his wetsuit.

conditional presupposition: If John is a scuba diver, he has a wetsuit

#non-conditional presupposition: John has a wetsuit.

The proviso problem holds equally well for subjunctive conditionals, although, as usual, subjunctives introduce some additional complications that I will discuss later.

- (73) a. If Sam were kind, he would bring his wife on vacation. (Lassiter 2012: 28)

non-conditional presupposition: Sam has a wife.

#conditional presupposition: If Sam were kind, he would have a wife

- b. If Sam were a diver, he would bring his wetsuit on vacation.

conditional presupposition: If Sam were a scuba diver, he would have a wetsuit

#non-conditional presupposition: Sam has a wetsuit.

For both indicatives and subjunctives, the technical challenge, which is also known as the *proviso problem* (Geurts 1996; Schlenker 2011), is to explain how a theory of presupposition projection correctly predicts when conditional projections are obtained and when they are not. The nature of the proviso problem thus depends on one's assumptions on how presupposition projection works. Under a *dynamic* theory of presupposition projection (e.g. Heim 1992), in which projection is explained as a consequence of the dynamic update mechanism, conditional presuppositions are always predicted to occur.<sup>25</sup> Hence, a mechanism that *strengthens* a conditional to a non-conditional presupposition is required to explain the cases in which the latter is attested. Van Rooij (2007) and Lassiter (2012) are proposals for such strengthening mechanisms in a dynamic setting.

There are also *representational* theories of presupposition projection, that view projection as a type of anaphora resolution (e.g. van der Sandt 1992). Under these theories a presupposition trigger

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<sup>25</sup>Let me illustrate with the simpler case of conjunction, which is also predicted to generate a conditional presupposition. Updating a context  $c$  with a conjunction  $A \wedge B$  involves first updating with  $A$  to get  $c + A$ , and then updating with  $B$ . Presuppositions are seen as definedness conditions on updates, so this means that  $c + A$  must entail the presuppositions of  $B$ , written  $c + A \models \pi(B)$ . By the Deduction Theorem, we then get the conditional presupposition  $c \models A \rightarrow \pi(B)$ . The same reasoning explains why a conditional  $A \rightarrow B$  has a conditional presupposition, but there are some additional complications involving the details of dynamic update (see sections 4.2.1 and 4.3.1 in Heim 1992).

is an anaphor that requires a salient antecedent. Projection amounts to resolving this antecedent in a place that may be outside the scope of the presupposition embedding operator. To illustrate, consider (72a) again. In *van der Sandt*'s DRT framework, the theoretical options for the embedded presupposition 'John has a sister' are to either be resolved in the main clause DRS as in (74a) (this amounts to a non-conditional presupposition), or to be resolved locally in the consequent of the conditional as in (74b) (this amounts to a conditional presupposition).<sup>26</sup>

(74) a. *Global accommodation*

[x; x=John, x has a sister, [∅; x flies to Rome] ⇒ [∅; x's sister will pick him up at the airport ] ]

b. *Local accommodation*

[x; x=John, [∅; x flies to Rome] ⇒ [∅; x has a sister, x's sister will pick him up at the airport ] ]

The proviso problem in representational theories involves formulating the right constraints that restrict the availability of global/local accommodation (*van der Sandt 1992* gives a number of such constraints). For example, given our judgments in (72a), the constraints should say that local accommodation is unavailable in the case of (74b).

Recent work has suggested that the dynamic and representational theories of presupposition projection should not be regarded as competing theoretical alternatives, but rather that both correctly describe different types of projection (*Roberts et al. 2009; Tonhauser et al. 2013*). I will not discuss the details of these proposals, but take from it what is important for our purposes. Recall that my goal was to explain the presupposition behavior of local 'also' in (69). Since additive particles are anaphoric presupposition triggers (recall (66) and the discussion on page 53 above), it is most convenient to study their presupposition projection behavior in terms of an *anaphoric* theory of projection.<sup>27</sup> Consequently, given that the antecedent of the presupposition trigger 'also' is the

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<sup>26</sup>The representations in (74) are linear representations of discourse representation structures (DRS'es), written as a pair [⟨DISCOURSE REFERENTS⟩; ⟨CONDITIONS⟩]. I assume the reader's basic familiarity with the DRT framework, see *Kamp and Reyle (1993)*.

<sup>27</sup>In footnote 31 below, I will argue that it is not only convenient to adopt an anaphoric theory, but that when

constituent that I refer to as the *presupposed alternative*, we should be considering the location of the presupposed alternative.<sup>28</sup> Specifically, I equate the question of whether the presupposition of ‘also’ in the consequent projects or not, to the question of where the presupposed alternative is located (Roberts et al. (2009: 9) make the same point: “the presuppositions triggered by an anaphoric trigger always “project” to the level of preceding context where an antecedent can be found”).

(75) Location of the presupposed alternative:	Type of presupposition:
in the <b>antecedent</b> of the conditional	↔ <b>conditional</b> presupposition
<b>outside</b> of the conditional	↔ <b>non-conditional</b> presupposition

Illustrating with data will make (75) clearer, but before doing so let me make a remark. In order to take away a potential source of confusion, it is good to reiterate that all the cases to be discussed in the remainder of this section involve instances of local ‘also’. The reason is that the proviso problem does not apply to non-local ‘also’ for the simple reason that non-local ‘also’ is not embedded in the consequent of the conditional, hence the template  $p \rightarrow q_\pi$  is not instantiated. As I argued above, non-local ‘also’ takes scope outside the conditional (see section 3.2).

I will distinguish between three cases (Case 1, 2, 3) based on the location of the presupposed alternative with respect to the conditional.

**Case 1.** The most straightforward case is the one in which the presupposed alternative is in the antecedent of the conditional, and the presupposition of ‘also’ is logically entailed by that antecedent. For example in (76), the presupposed alternative is ‘John<sub>i</sub>’, and the predicates in consequent and antecedent (‘comes’) match.

(76) If John<sub>i</sub> comes, MARY will ALSO<sub>i</sub> come.

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maintaining a strictly dynamic account of presupposition projection, certain facts cannot be explained.

<sup>28</sup>The reader should not get confused about the antecedent of a conditional, and the antecedent of an anaphoric presupposition trigger.

In (77) is a subjunctive example of the same sort.

(77) [John is a copycat, and always copies Mary's behavior]

If Mary<sub>i</sub> had picked box E, JOHN would ALSO<sub>i</sub> have picked box E.

These two examples are classic cases of presupposition filtering: after updating with  $p$ , the presupposition of  $q$  is entailed by the context set. As a result, the conditional as a whole does not carry the presupposition belonging to the consequent. It can also be seen as a trivial sort of conditional presupposition ('if John comes, John comes'). This is correctly predicted by all the classic theories of presupposition satisfaction (e.g. [Karttunen 1973](#); [Heim 1992](#); see [van der Sandt 1992](#): 360 for this type of filtering in his anaphoric account).

**Case 2.** In the second case, the presupposed alternative is again in the antecedent of the conditional, but there is no relationship of logical entailment between the antecedent of the conditional and the presupposition of 'also'. These types of examples feature prominently in theoretical and experimental work by [Schlenker \(2011\)](#) and [Chemla and Schlenker \(2012\)](#). In example (78) 'Ann' is the presupposed alternative of 'too',<sup>29</sup> but the predicates 'decide to study abroad' and 'make a stupid decision' are distinct. As a result, a conditional presupposition that 'if Ann decides to study abroad, someone (namely Ann) will make a stupid decision' is globally accommodated ([Chemla and Schlenker 2012](#): 187).

(78) If Ann decides to study abroad, her brother too will make a stupid decision.

presupposes: if Ann decides to study abroad, she will make a stupid decision

does not presuppose: someone (Ann) will make a stupid decision

In discussing examples of this sort, [Schlenker \(2011: 399\)](#) claims that for anaphoric presupposition triggers such as 'too' "conditional presuppositions are robustly obtained". This is a somewhat

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<sup>29</sup>[Chemla and Schlenker \(2012: §2.2.1\)](#) actually assume a propositional theory of 'too', in which 'too' takes a propositional associate, and a proposition as presupposed alternative, in this case 'Ann decides to study abroad'. These details are not important for the point I am making here, so I discuss their example (78) in terms of the idea that the associate of 'also' is a constituent.



confusing statement, since we will see in Case 3 below that additive particles sometimes do give rise to non-conditional presuppositions. I take it that Schlenker's claim must be read as being restricted to Case 2-conditionals.

**Case 3.** Finally, the presupposed alternative of 'too'/'also' may be located outside of the conditional. Examples of this type were already discussed in the older literature:

(79) [Mary<sub>i</sub> drinks, and. . .] If the bottle is empty, then John drinks too<sub>i</sub>.

(Karttunen and Peters 1979: 35)

Utterance (79) does not carry the conditional presupposition 'if the bottle is empty, somebody else than John (namely Mary) drinks', but rather the non-conditional presupposition that 'somebody else than John (namely Mary) drinks'.

My subjunctive conditional in (69) that we are trying to analyze, repeated here, belongs to Case 3 too: the presupposed alternative is '\$100' and is outside the conditional.

(80) [context: Mary picked box A, so she won \$100] (= (69))

If Mary had picked Box B, she would also have won a LAPTOP.

We thus expect a non-conditional presupposition, but what is troubling the judgments is that there is not only \$100 in Box A, but also \$100 in Box B. This relates to an additional complexity pertaining to subjunctive conditionals only, pointed out by Beaver (2001), that I will now discuss.

**Beaver's constraint** Beaver (2001: 98) presents the following data:

- (81) a. Mary owns a donkey. If she had been a farmer, she would have beaten it.  
b. #Mary owns a donkey. If she had not owned any animals, she would have beaten it.  
c. #Mary owns a donkey. If she had owned a mule instead, John would have owned a donkey too.

Example (81a) shows that the pronoun ‘it’ in the consequent may have an antecedent outside the conditional, but (81b) illustrates that this is subject to certain restrictions. Informally speaking, in evaluating (81a) we counterfactually assume that Mary is a farmer, but leave the fact that she has a donkey fixed. It is this last fact that establishes the existence of an antecedent for the pronoun ‘it’. In (81b), on the other hand, what we counterfactually assume is the very non-existence of the donkey. The result of this is that reference to the donkey by the pronoun ‘it’ is no longer possible. Or, as Beaver puts it: “not only must the antecedent to a pronoun be on the accessibility path, it must correspond to an object which *exists*” (p. 98, italics in original). Sentence (81c) makes the same point for presupposition triggers: the presupposed alternative of ‘too’ would be ‘Mary’, but the antecedent of the conditional prevents this from happening, as it counterfactually assumes that Mary had owned a mule *instead* of a donkey. I will refer to the ensuing constraint as Beaver’s constraint, because as far as I know Beaver (2001) was the first to discuss it, although similar data have been mentioned in later work (see e.g. Roberts 2006: 20). Beaver does not formulate his constraint explicitly, but here is my interpretation of it (formulated specifically to the case of ‘also’/‘too’ here, although Beaver’s point in (81) is of course more general):

(82) *Beaver’s Constraint* (first version)

In a subjunctive conditional of the form ‘if  $p$ , would [also/ $\alpha_i$ /too $\alpha_i$   $\varphi$ ], with the presupposed alternative  $\alpha_i$  outside of the conditional, in all the  $p$ -worlds over which the conditional quantifies,  $\varphi(\alpha_i)$  must be true.

Sentence (81c) does not satisfy this constraint, because in the  $p$ -worlds in the domain of quantification, it is not the case that ‘Mary owns a donkey’ is true.

My game show scenario (see (40)) represents a special case. Since we need to be precise here, let me distinguish between ‘\$100<sub>A</sub>’ for the \$100 in Box A, and ‘\$100<sub>B</sub>’ for the \$100 in Box B. At first sight, (80) appears to be a type of context that violates Beaver’s constraint: the presupposed alternative of ‘also’ is \$100<sub>A</sub>, but in the  $p$ -worlds that the conditional quantifies over it is no longer true that Mary won \$100<sub>A</sub>, as she picked Box B *instead* of Box A.<sup>30</sup> Yet, this is an acceptable

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<sup>30</sup>It is important to establish that the presupposed alternative is indeed \$100<sub>A</sub> and not \$100<sub>B</sub>. To see this, consider

sentence, showing that for Beaver’s Constraint to be satisfied the presupposed alternative need not exist in all the  $p$ -worlds, but it is enough for there to be an entity that is *type-identical* to the presupposed alternative. In the game show scenario the presupposed alternative is \$100<sub>A</sub>, and \$100<sub>B</sub> is the type-identical object in the counterfactual worlds. My game show scenario thus gives reason to improve on Beaver’s constraint as follows:

(83) *Beaver’s Constraint* (final version)

In a subjunctive conditional of the form ‘if  $p$ , would [also <sub>$i$</sub> /too <sub>$i$</sub>   $\varphi$ ]’, with the presupposed alternative  $\alpha_i$  outside of the conditional, in all the  $p$ -worlds over which the conditional quantifies,  $\varphi(\alpha'_i)$  must be true, where  $\alpha'_i$  is either  $\alpha_i$  or an object that is type-identical to  $\alpha_i$ .

In order to make sure that this modification of Beaver’s Constraint is not some artifact of the game show context, let me present a different example that makes the same point. Suppose three bookstores give out various free books:

(84) *In bookstore 1, you get a free copy of Book A. In bookstore 2, you get a free copy of Book A and Book B. In bookstore 3, you get a free copy of Book B and Book C.*

*Mary went to bookstore 1 and got Book A.*

- a. If Mary had gone to Bookstore 2 instead, she would also have gotten [Book B]<sub>F</sub>.
- b. #If Mary had gone to Bookstore 3 instead, she would also have gotten [Book B]<sub>F</sub>.

Sentence (84a) is felicitous even though, clearly, Book A she gets in bookstore 1 and Book A she gets in bookstore 2 are not identical tokens. However, they are type-identical (different copies of the same book), so (83) gives the correct prediction. Sentence (84b) is infelicitous, because the copy of Book C she gets there, is not type-identical to Book A from bookstore 1 in the actual world.

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the following variant of (80):

- (i) [context: Mary picked box C, so she didn’t win any prize]  
#If Mary had picked Box B, she would also have won a LAPTOP.

Since Box C is empty, the only potential presupposed alternative is \$100<sub>B</sub>. However, this does not yield an acceptable sentence (it cannot mean that if Mary had picked Box B, she would have won a laptop in addition to \$100).

**Conclusion: presupposition projection and local ‘also’** In conclusion, we saw that local ‘also’ in my example (80) yields a *non-conditional* presupposition because its presupposed alternative (‘\$100<sub>A</sub>’) is located outside of the conditional (a Case 3-conditional). Our intuition that the *conditional* inference ‘if Mary had picked Box B, she would have won \$100’ also holds, relates to Beaver’s constraint, which requires there to be a copy of the presupposed alternative available in the *p*-worlds. The combination of the presupposition projection behavior of ‘also’ and Beaver’s constraint is thus the reason why our intuitions about the presuppositional status of (80) are not so sharp.

We started the semantic analysis of local ‘also’ in this section by first describing the assertive part (in (70)). For the more complicated presuppositional part, I showed that various instances of local ‘also’ (Case 1, 2, 3) have different projection behaviors. This can be explained if it is assumed that *anaphoric* presupposition triggers such as additive particles are described in an *anaphoric* (representational) theory of projection. In that case the projection behavior mirrors the location of their presupposed alternative (recall (75) above).<sup>31</sup>

### 3.3.2 Projection and $CF_q$

I will finish this chapter by taking care of a potential objection against my analysis that the difference between local and non-local ‘also’ lies in the syntactic position of ‘also’ and what associate

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<sup>31</sup>One might wonder how the projection behavior of additive particles is handled if instead one assumes a strictly dynamic theory (like Heim (1992), whose dynamic definition of ‘too’ I gave in (66) above). As I noted, such theories have to appeal to a mechanism of strengthening that explains when non-conditional presuppositions are attested. A number of recent proposals for such a strengthening mechanism rely on the notion of probabilistic independence (e.g. van Rooij 2007; Lassiter 2012). The basic idea is that the difference between (72a) and (72b) is that having a sister is independent from flying to Rome, but having a wetsuit and being a scuba diver are not independent. The proposed generalization is that a non-conditional presupposition arises when the antecedent and the presupposition of the consequent are taken to be independent. Given that a very similar independence distinction appears to underlie the contrast in (73), it has been suggested (Lassiter 2012: §7.1; van Rooij 2007: 300-301 and his fn. 20) that a similar analysis should work for counterfactuals, although this has not been fully formalized.

I believe that the different projection behaviors in Case 1, 2, 3 present a problem for such theories. For example, in (80) we find a non-conditional presupposition yet there is *no* independence: upon learning that Mary picked Box B, the probability that Mary wins \$100 increases:

- (i)  $P(\text{Mary won } \$100 | \text{Mary picks Box B}) > P(\text{Mary won } \$100)$

Knowing that Mary picks Box B, makes it more likely that Mary won \$100 (if Mary chooses randomly, the first probability is 3/5, the second is 1). Hence we find a non-conditional presupposition when there is no independence, against the proposed generalization.

they take. One might instead try to argue that the differences between the association of ‘also’ in (41a) and (41b), as well as the related different behavior with regard to  $CF_q$ , are the result of the presupposition of ‘also’ projecting in different ways.

(85) *Theory S (to be rejected)*

The difference between local and non-local ‘also’ amounts to a difference in how the presupposition of ‘also’ projects.

Although the discussion about presupposition so far should have made it clear that Theory S will not work, let me be explicit and give two arguments against the idea. The first argument is that it appears to be based on a misconstrual of the difference between the associate and the presupposed alternative of ‘also’. The second argument is based on the observation of the independence of the presence of  $CF_q$  and the presupposition projection behavior of local ‘also’: we can find examples in which the presupposition of local ‘also’ projects and in which it does not project, but in both cases  $CF_q$  is unaffected.

For the first argument, recall that in section 3.1 I showed that non-local ‘also’ associates with material in the antecedent of the conditional, while local ‘also’ associates with material in the consequent of the conditional. Presupposition projection of ‘also’, however, does not affect what the associate of ‘also’ is.

- (86) a. If John<sub>i</sub> had called you a Republican, [Mary]<sub>F</sub> would ALSO<sub>i</sub><sup>local</sup> have insulted you.  
local ‘also’; associate of ‘also’ = Mary; conditional presupposition (Case 2)
- b. Bill<sub>i</sub> insulted you. And if Mary had been here, [Mary]<sub>F</sub> would ALSO<sub>i</sub><sup>local</sup> have insulted you.  
local ‘also’; associate of ‘also’ = Mary; non-conditional presupposition (Case 3)

In either case, the associate of local ‘also’ is ‘Mary’. However, the presupposed alternatives are different in (86a) and (86b), and hence the presupposition projection behavior is different (a conditional presupposition in (86a) and a non-conditional presupposition in (86b)). This shows that

Theory S cannot be right: just appealing to presupposition projection of ‘also’ cannot possibly explain how one type of ‘also’ associates with material inside the consequent, and another type of ‘also’ associates with material outside the consequent.

For the second argument, the reader can check that in all the subjunctive conditionals we have discussed in this section  $CF_q$  is generated in the regular fashion: in (77) John did not pick Box E, in (80) Mary did not win a laptop, in (86) Mary did not insult you. Yet the presupposition projection behavior was different in each case (filtered in (77), non-conditional in (80) and conditional in (86)). Thus the way the presupposition of ‘also’ projects and the generation of  $CF_q$  are independent phenomena. An account that seeks to derive the presence or absence of  $CF_q$  directly from the presupposition projection behavior of ‘also’ in the consequent, which Theory S proposes, is thus flawed.

**Interim summary** Chapters 2 and 3 conclude the main empirical section of the dissertation. More accurately, they conclude that part of the empirical discussion that is required to build my analysis. In chapter 2 I presented a variety of contexts that cancel the  $CF_q$  inference. One group is formed by subjunctive conditionals with ‘also’ in their consequent, although I noted that there are also subjunctive conditionals with ‘also’ that are not  $CF_q$ -cancellation contexts. In this chapter I clarified the empirical picture by showing that what determines whether ‘also’ does or does not cancel  $CF_q$  is the location of its focus associate. The cases in which ‘also’ cancels  $CF_q$  are cases in which ‘also’ takes an associate outside of the consequent (hence I called these cases ‘*non-local* also’). The cases in which ‘also’ does not cancel  $CF_q$  are cases in which ‘also’ takes an associate inside the consequent (called ‘*local* also’). The second part of this chapter involved a bit of theoretical analysis, as I explained that instances of local ‘also’ do not present a puzzle: they do not cancel  $CF_q$ , and are accounted for by existing theories of additive particles, the semantics of conditionals, and presupposition projection.

Although this chapter has not yet given a completely exhaustive empirical description of all  $CF_q$ -cancellation contexts from chapter 2 (e.g., I haven’t talked about the data with ‘still’, and the

contrast (29)/(31)), the observations on focus-sensitivity made in this chapter are sufficient to start building my analysis. As we will see in chapter 4, the analysis will be general enough to not just apply to the  $CF_q$ -cancellation contexts with non-local ‘also’ as discussed in this chapter, but in addition to some of the contexts from chapter 2 not discussed here.

## 4 Discourse structure and multiple cause contexts

In chapters 2 and 3 I reached some empirical generalizations regarding the presence of ‘also’ in the consequent of a subjunctive conditional, and the cancellation of the counterfactual inference of the consequent ( $CF_q$ ). The crucial empirical distinction was between local and non-local ‘also’. Local ‘also’ takes a focus associate inside the same (consequent) clause, and does not cancel  $CF_q$ . Non-local ‘also’ takes a focus associate in the antecedent clause, and cancels  $CF_q$ . An example is repeated below:

(87) [context: Mary picked box A, so she won \$100.]

- a. If Mary had picked box B, she would also have won a LAPTOP. [local ‘also’]
- b. If Mary had picked box D, she would ALSO have won \$100. [non-local ‘also’]

Moreover, I showed that by combining existing theoretical accounts of additive particles, conditionals, and presupposition projection, we can correctly describe the meaning of local ‘also’ (section 3.3). The case that is central to the research questions of this dissertation is non-local ‘also’, because it forms  $CF_q$ -cancellation contexts.

In this chapter I begin by analyzing non-local ‘also’. I will argue that what sets conditionals with non-local ‘also’ apart from conditionals with local ‘also’ is that only the former occur in contexts in which more than one cause for the same consequent is salient. I will call such contexts **multiple cause contexts**. In chapters 5 and 6, I will show how multiple cause contexts are linked to the cancellation of  $CF_q$ . Graphically, in terms of the roadmap I gave in the outline of the dissertation, I now start with the first step of my analysis:

Data	Determine empirically the class $S$ of contexts that are $CF_q$ -cancellation contexts.
Analysis	<p>⇒ (A) <b>The contexts in <math>S</math> are characterized by the pragmatic property that more than one antecedent is salient for the same consequent.</b></p> <p>(B) Conditional perfection (the pragmatic strengthening of conditionals into biconditionals) is a necessary ingredient for <math>CF_q</math> to arise.</p> <p>(C) Contexts with the pragmatic property in (A) do not have conditional perfection.</p>



It may be helpful to the reader to think of this chapter as being divided into two parts. The first half of the chapter (up to section 4.5) is only concerned with  $CF_q$ -cancellation contexts with non-local ‘also’, and will culminate in showing that those contexts are multiple cause contexts. The analytic tools that are used to reach that goal naturally give rise to the prediction that there are other multiple cause contexts without the focus particle ‘also’. The second part (from section 4.6) of the chapter is devoted to them. This will correspond to some  $CF_q$ -cancellation contexts from ‘class 3’ presented in chapter 2, that I left out of the discussion so far.

## 4.1 Introduction

My analysis of non-local ‘also’ starts by the observation that the conditional sentences in which it appears have a special intonation pattern. In chapter 3 we saw that non-local ‘also’ must be focused. For example, in Figure 1 on page 41 we can clearly see a high pitch accent on ‘also’, followed by deaccenting of the rest of the material in the prosodic phrase (more pitch contours of conditional sentences with non-local ‘also’ can be found in Appendix B). This is the typical realization of nuclear pitch accent in English (Ladd 2008). This is an important point because this intonation pattern deviates from the canonical intonation pattern of focus particles, namely in which it is the associate of a focus particle that is focused, and not the particle itself (recall also the preliminary discussion on this point on page 39).

- (88) a. I also invited BILL to the party. [Canonical pattern: associate focused]  
 b. #I ALSO invited Bill to the party. [# focus particle focused]<sup>32</sup>  
 c. I only invited BILL to the party. [Canonical pattern: associate focused]  
 d. #I ONLY invited Bill to the party. [# focus particle focused]

A well known observation in the literature is that in certain cases focus particles may deviate from the pattern in (88a/c) and get stressed. The cases of this type that have been discussed in the

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<sup>32</sup>This # judgment is for neutral contexts. In corrective contexts (88b/d) are acceptable (e.g. ‘I didn’t say that I ONLY invited Bill, I said that I ALSO invited Bill’).

literature do not include my conditional data with non-local ‘also’, but are of a simpler sort, and can be characterized as cases in which the focus particle linearly *follows* its associate. Therefore, such particles are called **postposed stressed focus particles** (Reis and Rosengren 1997; Krifka 1999; Sæbø 2004; Sudhoff 2010). An example is given in (89), in which stressed ‘also’ follows its associate ‘Mary’:

(89) John lives in France, and Mary **ALSO** lives in France.

As we will see later, the prosodic difference between (88a) and (89) corresponds in a systematic fashion to a difference in the information structure of the discourse in which these sentences may be embedded. Hence, analyzing non-local ‘also’ as a postposed stressed additive particle not only promises to explain the deviant intonation pattern that we attested, but also provides the conceptual link to discourse structure. My aim is to explain how discourse structure affects counterfactual inferences, and on a parallel analysis, what can be said about the role of discourse structure in the theory of postposed stressed additive particles, will translate to the domain of conditionals.

Besides the prosodic similarity, there is a second reason that invites an analysis of non-local ‘also’ as a postposed stressed focus particle. Krifka (1999) points out that additive particles (‘too’, ‘also’) may function as postposed stressed focus particles, but exclusive (‘only’) or scalar (‘even’) particles cannot:

(90) John lives in France, **TOO** / **ALSO** / \***ONLY** / \***EVEN**.

Likewise, in the case of conditionals we cannot have ‘only’ or ‘even’ in the position of non-local ‘also’. This is shown in (91):

- (91) a. \*If Mary had opened Box A, she would **ONLY** have won \$100.  
cannot mean: only if Mary had opened Box A, she would have won \$100.
- b. \*If Mary had opened Box A, she would **EVEN** had won \$100.  
cannot mean: even if Mary had opened Box A, she would have won \$100.

Thus we find that the restriction to additive particles is a second similarity between postposed stressed additive particles and stressed focus particles in the position of non-local ‘also’.

Before I can provide additional arguments that drawing the parallel to postposed stressed focus particles is indeed the correct analysis, I first need to introduce some formal tools to talk about discourse structure (done in section 4.2). An important result from this theory is the **Contrastive Topic Hypothesis**, which says that postposed stressed additive particles associate with contrastive topic (Krifka 1999). I will show that this hypothesis extends to conditionals: the associate of non-local ‘also’ is a contrastive topic. Establishing this fact is an important goal: combined with our previous finding that the associate of non-local ‘also’ is located within the antecedent of the conditional (chapter 3), we conclude that there is a contrastive topic in the antecedent. This will lead to the key notion to be introduced in this chapter, that of a *multiple cause context*.

**Outline of the chapter** In section 4.2 I give a quick review of some basic concepts relating to discourse structure, questions, and contrastive topic. Section 4.3 then picks up the narrative by looking at postposed stressed additive particles in more detail. I argue in detail for the claim that non-local ‘also’ is to be analyzed as a postposed stressed additive particle. This requires some more background on contrastive topic in conditionals (section 4.4), but in section 4.5 I complete the argument, and explain the relation to multiple cause contexts. This concludes the first part of the chapter.

In the second part of the chapter, starting from section 4.6, I focus on another important property of postposed stressed additive particles, namely that they are often *obligatory*. By again drawing parallels to conditional data, we will find a natural explanation for why some other  $CF_q$ -cancellation contexts, such as the ‘listing context’ from chapter 2, are multiple cause contexts. In sections 4.7 and 4.8 I show how theoretical accounts of the obligatoriness of postposed stressed additive particles extend to my conditional data (in particular I will review Krifka 1999 and Sæbø 2004). Some additional observations that are relevant to stressed additive particles, but not directly related to the story laid out in this chapter, are given in appendices to this chapter, 4.A and 4.B.

## 4.2 Background: discourse, questions, and contrastive topic

I will adopt the general idea that discourse can be modeled as a language game of questions and answers (van Kuppevelt 1995; Roberts 1996/2012). In his famous work on assertion, Stalnaker (1978) described the general goal of communication as for interlocutors “to distinguish among alternative ways that things might be, or might have been” (p. 316). This goal can also be formulated as a question; in that case interlocutors are seeking to answer the question “What is the way things are or might be?”, which has been called the ‘Big Question’. The structure of a discourse is then modeled as a sequence of smaller questions and answers directed towards the (elusive) goal of answering the Big Question, as represented schematically in Figure 2a. This view of discourse may also conveniently be represented in a hierarchical tree structure, called a *d-tree* (Büring 2003), as in Figure 2b.

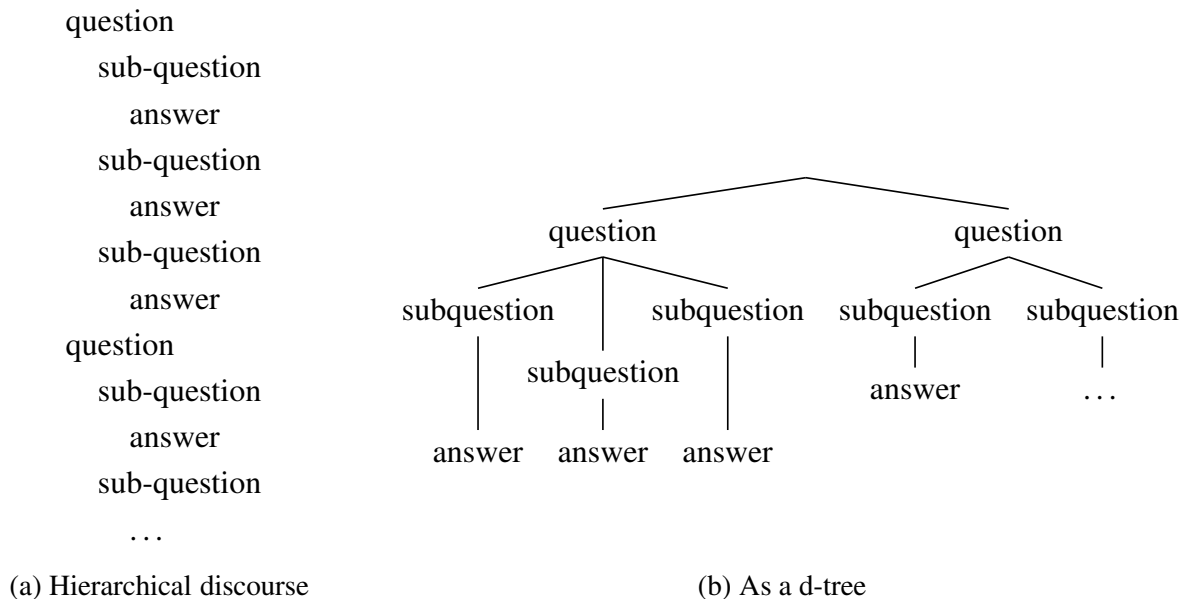


Figure 2. Hierarchical discourse structure

Discourse thus conceived consists of a sequence of assertion and question moves. What counts as a valid move is constrained by pragmatic principles, for example the principle of Relevance:

(92) *Relevance*

(cf. Roberts 1996/2012: 16)

An assertion (i.e. non-question) move must be an answer or partial answer to the question most recently accepted into the discourse by the interlocutors, called the (*immediate*) *question under discussion*, abbreviated QUD.

Now of course, most often the question under discussion will be implicit (unpronounced). However, there are linguistic cues that can help interlocutors recover the implicit question under discussion. *Intonation* is one of the main such cues, via the general principle of *congruence*: for an assertion to be a valid answer to a question, the choice of intonation is not free, but must rather match the answered question in a systematic way. I will discuss two types of congruence: *question-answer congruence*, and, most importantly for our purposes, *contrastive topic congruence* (Büring 2003).

**Focus and contrastive topic** Jackendoff (1972) observed that there is a relationship between the intonation contour a constituent has and the role that constituent plays in discourse. He distinguished between two constituent-level accents, which he dubbed A-accent (falling accent) and B-accent (fall-rise accent). In a scenario in which several people eat different things, the following examples (Jackendoff 1972: 261) illustrate the contrast between the A-accent and the B-accent:

(93) What about FRED? What did HE eat?

a. [Fred]<sub>B-accent</sub> ate the [beans]<sub>A-accent</sub>.

b. # [Fred]<sub>A-accent</sub> ate the [beans]<sub>B-accent</sub>.

(94) What about the BEANS? Who ate THEM?

a. [Fred]<sub>A-accent</sub> ate the [beans]<sub>B-accent</sub>.

b. # [Fred]<sub>B-accent</sub> ate the [beans]<sub>A-accent</sub>.

A-accent = falling accent = H\* L-L%

= *focus* accent

B-accent = fall-rise accent = L+H\* L-H%

= *contrastive topic* accent

In more modern work, the A-accent is called *focus* accent, and is written in ToBI notation as H\*

L-L%, and the B-accent is called *contrastive topic* (CT) accent, and is written as L+H\* L-H%.<sup>33, 34</sup>

Before explaining the notion of question-answer congruence, I need to spend a few words on the term ‘focus’. There are several excellent overviews of focus and focus-related phenomena (see for example Beaver et al. 2007: §2; Krifka 2007; Zimmermann and Onea 2011 for summaries from different perspectives), so my remarks here will be restricted to the minimum that we need for my later discussion. The term *focus* refers to a phenomenon that has manifestations on all linguistic levels (phonology, syntax, semantics, pragmatics, information structure) and for each level corresponding representations of focus have been proposed. Syntactically, focus is represented by F-marking of a constituent, written [X]<sub>F</sub>.<sup>35</sup> The main semantic role of focus is to introduce *alternatives* (cf. Fălăuș 2013), which has been formalized in an influential theory of focus semantics by Rooth (1992), called *alternative semantics*. Alternative semantics is a two-dimensional theory that assigns to each expression two semantic values: the ordinary semantic value, and the focus semantic value. The ordinary semantic value, written  $\llbracket \cdot \rrbracket^o$ , is the regular semantic value obtained by the compositional function in the usual fashion and ignores any F-marking. Informally speaking, the focus semantic value of a constituent is the set of expressions obtained by substituting the F-marked constituent with elements of the same semantic type. So the focus semantic value of ‘I

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<sup>33</sup>I give here a somewhat simplified representation of these accents, as the details of the complicated phonological situation do not concern us. See Constant (2014: §5) for details.

<sup>34</sup>I have seen a number of papers in semantics that attempt to explain the ToBI notation in a single footnote. I have never found these very helpful until I studied the system in more detail (see Beckman and Hirschberg 1994; Beckman et al. 2005) and had some practical training. If the reader does not want to do that, here is my own humble attempt at writing the ToBI Footnote.

ToBI (tones and break indices) is a prosodic annotation system. ToBI marks accents at three levels of hierarchical prosodic structure in English. Beginning with the largest level, these are: intonational phrase, intermediate phrase, and the word level.

Marked at the word level are *pitch accents*, denoted H\* (high) and L\* (low). These associate with the stressed syllable of the word. There are also bitonal pitch accents: L+H\* (rising within a word to a high pitched stressed syllable) and L\*+H (rising within a word from a low pitched stressed syllable). In the domain of the intermediate phrase, there is a *phrase accent*, denoted H- or L-, marked at the end of an intermediate phrase. Finally, the end of an intonational phrase is marked with a boundary tone (H% or L%). Due to the hierarchical structure, the end of an intonational phrase always coincides with the end of an intermediate phrase. Hence, the boundary tone is written as a unit with the phrase accent (L-H%, L-L%, ...), but note that they represent markings at two distinct levels.

The A accent thus consists of a prominent word with a high pitch accent (H\*), and a falling accent at the end of the intermediate/intonational phrase (L-L%). The B accent consists of a bitonal rising pitch accent (L+H\*), and a boundary tone rising from a low phrase accent (L-H%).

<sup>35</sup>The relation between the phonology and the syntax of F-marking is a very complicated matter, that I will leave aside completely. See Selkirk (1996) and Schwarzschild (1999).

like MARY’, written  $\llbracket \text{I like } [\text{Mary}]_F \rrbracket^f$ , is the set of propositions  $\{\text{I like } x \mid x \in D_e\} = \{\text{I like John, I like Linda, I like Peter, } \dots\}$ . More formally:

- (95) a.  $\llbracket X \rrbracket^f = \{\llbracket X \rrbracket^o\}$  if X is not F-marked  
 b.  $\llbracket [Z]_F \rrbracket^f = D_{\text{type}(Z)}$   
 c.  $\llbracket [A + B] \rrbracket^f = \{x \mid \exists \alpha, \beta : \alpha \in \llbracket A \rrbracket^f, \beta \in \llbracket B \rrbracket^f, x = \alpha + \beta\}$

The focus semantic value of a proposition like ‘I like  $[\text{Mary}]_F$ ’ is similar to the denotation of a question, according to the influential view on the meaning of questions by Hamblin (1973). Hamblin semantics of questions states that the denotation of a question is the set of its possible answers, so  $\llbracket \text{Who did Mary call?} \rrbracket$  is the set  $\{\text{Mary called Peter, Mary called Linda, Mary called Fred, } \dots\}$ . The similarity between focus semantic value and the denotation of questions has been the basis of *question-answer congruence* (cf. Rooth 1992: §2.4; Roberts 1996/2012: 31; Constant 2014: §3.2.1; Zimmermann and Onea 2011: §1.4, etc.):

(96) *Question-answer congruence*

An answer  $A$  is congruent to a question  $Q$  if the set of (contextually restricted) focus alternatives to  $A$  is a subset of the question denotation of  $Q$ , i.e.  $\llbracket A \rrbracket^f \subseteq \llbracket Q \rrbracket$ .

To see this worked out in an example, consider the following:

- (97) Who did Mary call?  
 a. Mary called  $[\text{John}]_F$ .  
 b.  $\#[\text{Mary}]_F$  called John.

The question denotation matches with  $\llbracket (97a) \rrbracket^f = \{\text{Mary called } x \mid x \in D_e\}$ , but not with  $\llbracket (97b) \rrbracket^f = \{x \text{ called John} \mid x \in D_e\}$ . The latter set contains ‘Peter called John’ for example, but this is not a possible answer to  $Q$ , so it is not a member of  $\llbracket Q \rrbracket$ .

**Contrastive topic** The role of contrastive topic is to mark a *partial* answer to a question. This can be seen in cases in which there is only CT-marking in an utterance, and no F-marking (the so-called ‘Lone CT’ cases in Constant 2014):

- (98) Do any of our students live in France?  
 [Mary]<sub>CT</sub> does ...

The intonation indicates that the answer that Mary lives in France is only a partial answer to the question. The same utterance without CT marking would be the normal (exhaustive) answer that of our students Mary is the one who lives in France.

It is important to observe that this notion of contrastive topic is unrelated to the notoriously difficult to characterize notion of “aboutness topic” (e.g. Chafe 1976, cf. Krifka 2007: §5) which refers to what the speaker is talking about. Contrastive topic is a precise notion that can be formalized in the discourse semantic framework sketched above.

Büring (2003) formalizes the requirement of partiality in his definition of *CT congruence*. In order to state this definition, besides  $[[\cdot]]^o$  and  $[[\cdot]]^f$  he proposes a third type of semantic value: contrastive topic semantic value, denoted  $[[\cdot]]^{ct}$ . Where the focus semantic value is obtained by substituting the F-marked constituent with other elements, the CT semantic value is obtained by substituting the F-marked **and** the CT-marked constituents. More precisely, the CT semantic value is obtained by substituting the CT-marked constituent for an alternative of the same type, and then computing the focus semantic value for each element. This yields a set of sets:<sup>36</sup>

- (99) a.  $[[\text{Fred ate the } [\text{beans}]_F]]^f = \{ \text{Fred ate the beans, Fred ate the pizza, Fred ate the pasta, ...} \}$   
 b.  $[[[\text{Fred}]_{CT} \text{ ate the } [\text{beans}]_F]]^{ct} = \{ [[x \text{ ate the } [\text{beans}]_F]]^f \mid x \in D_{\text{type}(\text{Fred})} \} =$

---

<sup>36</sup>Having three semantic values is clearly not very parsimonious, especially given that  $[[\cdot]]^f$  and  $[[\cdot]]^{ct}$  are computed in very similar ways. Constant (2014) shows in detail how the CT-semantic value can be derived in a framework that only has F-marking. Moreover, in his framework question-answer congruence and CT congruence are both derived from a more general principle. Although his theory obtains greater empirical coverage as well as theoretical elegance, the theory requires a lot of extra machinery. Since the empirical and theoretical advantages of Constant’s theory are not relevant for our purposes, I will stick with Büring’s original treatment for simplicity.



{ { Fred ate the beans, Fred ate the pizza, Fred ate the pasta, ... },  
 { Mary ate the beans, Mary ate the pizza, Mary ate the pasta, ... },  
 { Peter ate the beans, Peter ate the pizza, Peter ate the pasta, ... }, ... }

Just like the focus semantic value of a proposition is similar to the Hamblin-denotation of a question (‘What did Fred eat?’), the CT-semantic value of a proposition is similar to a set of questions: { What did Fred eat?, What did Mary eat?, What did Peter eat? ... }.<sup>37</sup>

Now CT congruence is formulated as follows:

(100) *CT congruence* (Büring 2003: 520)

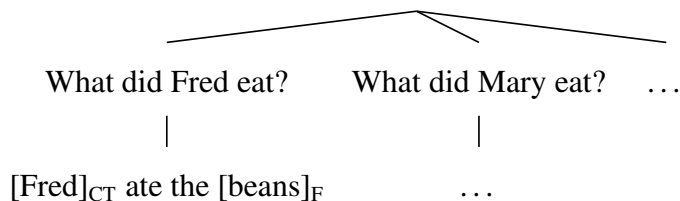
An utterance  $U$  containing a contrastive topic is felicitous when there is a non-singleton set  $Q'$  such that for each  $Q \in Q'$ :

(i)  $Q$  is the immediate question under discussion w.r.t.  $U$  or a sister of it in the d-tree

(ii)  $\llbracket Q \rrbracket^o \in \llbracket U \rrbracket^{ct}$

To illustrate, consider the d-tree in (101). The utterance  $U = \text{‘[Fred]}_{CT} \text{ ate the [beans]}_F\text{’}$  is felicitous in this discourse because there is a non-singleton set {What did Fred eat?, What did Mary eat?, ...} that satisfies the conditions in (100): it contains both the immediate QUD for  $U$  (which is ‘What did Fred eat?’) and its sisters (condition (i)), and the questions in the set are members of  $\llbracket U \rrbracket^{ct}$  (see (99b)) (condition (ii)).

(101) (from Büring 2003: 520)



<sup>37</sup>Alternatively, it can be thought of as a multiple *wh*-question ‘Who ate what?’, as in Constant (2014).

Note that although the definition in (100) does not directly refer to partial answers, this is encoded in the requirement that the set  $Q'$  be non-singleton. If an utterance is an answer to a subquestion and there is *more than one* such subquestion, the utterance constitutes a partial answer. In (101), for example, the utterance is only an answer to the subquestion ‘What did Fred eat?’, but not to ‘What did Mary eat?’. Hence it is a partial answer to the original question ‘What did everyone eat?’.

### 4.3 Postposed stressed additive particles

Returning to the narrative, we will now look at postposed stressed additive particles in some more detail. The study of postposed stressed focus particles starts with the observation that there is a parallel with constructions that contain a contrastive topic (Krifka 1999, see also Sudhoff 2010: 106ff. for discussion). Consider a typical simple sentence with ‘too’:

(102) John lives in France and Mary lives in France, TOO.

The parallel with contrastive topic is stated in (103), and is twofold: first, (103a) has the same intonation as (102) (repeated as (103b) with CT- and F-marking). Second, there is a semantic parallel: (103a) and (103b) are both felicitous answers to the question ‘Where do John and Mary live?’.

(103) Where do John and Mary live?

a. [John]<sub>CT</sub> lives in [France]<sub>F</sub>, and [Mary]<sub>CT</sub> lives in [Spain]<sub>F</sub>.

b. [John]<sub>CT</sub> lives in [France]<sub>F</sub>, and [Mary]<sub>CT</sub> lives in France [too]<sub>F</sub>. (= (102))

This connection has led to the idea that postposed stressed additive particles, such as ‘also’ and ‘too’, must associate with a contrastive topic:

(104) *Contrastive Topic Hypothesis* (Krifka 1999)

The associated constituent of postposed stressed additive particles is the contrastive topic of the clause in which they occur.<sup>38</sup>

My goal, recall, is to show that the associate of non-local ‘also’ in subjunctive conditionals is a contrastive topic. At this point it might therefore be tempting to follow a simple line of reasoning:

(105) P Non-local ‘also’ is stressed and follows its associate in sentences like (106) (repeated from (41b)), so it is a postposed stressed additive particle.

C Hence, by (104), the associate of non-local ‘also’ is a contrastive topic.

(106) If Mary had picked box D, she would ALSO have won \$100. (=41b))

Such an explanation, however, is too quick. We cannot assume that the Contrastive Topic Hypothesis automatically generalizes to conditional sentences, because the data on which it has been based are limited in two respects. First, the evidence is based on syntactically simple sentences, in particular (conjunctions of) monoclausal sentences such as the ones in (103) (Krifka uses sentences like ‘Peter ate pasta, and Pia ate pizza’ and although Sæbø (2004) considers bigger discourses, he does not go into syntactically more complex constructions either). Second, Krifka and Sæbø both consider the additive particle ‘too’ only, which is more restricted in its syntactic distribution than ‘also’ in that the former is always postposed. This makes ‘too’ not a good candidate to investigate the alleged relationship between stress on focus particles and the linear order between particle and associate. That this is a legitimate worry, is shown quite dramatically by sentence-final *if*-clauses that I discussed earlier in (63), repeated below.

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<sup>38</sup>Krifka (1999: §2.3) provides some further evidence in favor of the Contrastive Topic Hypothesis besides the data in (103). One argument is based on an observation that complex CT is not possible in the way that complex focus is possible (see my (49)). Krifka shows that it is indeed not possible for postposed stressed additive particles to associate with two constituents, as predicted by the Contrastive Topic Hypothesis and the lack of complex CT. In continuation of my side note on page 43 on combining local and non-local ‘also’, this explains why ‘also’ in the consequent of a conditional cannot associate *both* with material in the antecedent and material in the consequent.

- (107) a. We would ALSO have been here in time if you had taken the other road.  
b. If we had taken the other road, we would ALSO have been here in time.

Here the stress pattern on ‘also’ remains the same, irrespective of whether it linearly precedes or follows its associate. See appendix 4.B for further discussion of this point.

We thus want independent evidence that the associate of non-local ‘also’ is a contrastive topic. Because the empirical parallel illustrated in (103) led to the postulation of the Contrastive Topic Hypothesis in (104), my goal is to construct a pair just like (103) but in the domain of conditionals. We would like a pair consisting of (a) a conditional sentence that has CT in its antecedent by virtue of its being a partial answer to a conditional question, and (b) a conditional sentence with non-local ‘also’ (i.e. our central data point). The former can be readily constructed, but we need some background on conditional questions and answers. I will provide that first in section 4.4.

In section 4.5 I pick up the narrative, and construct the pair. I will show that there are prosodic and semantic similarities that justify the claim that the associate of non-local ‘also’ is a CT.

#### 4.4 Conditionals, CT and questions

Conditional sentences can be an answer to various types of questions. First, it should be noted that a conditional sentence can be an answer to a simple yes-no question that does not explicitly ask for any sort of condition. Here are two examples from the literature:

- (108) a. Q: Will Robin come to the party? (von Fintel 2001: 16)  
A: If there is vegetarian food (Robin will come to the party).<sup>39</sup>

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<sup>39</sup>Von Fintel (2001: 17) suggests that the question-answer sequence in (108a) omits some “intermediate steps”, that may be spelled out as follows:

- (i) Q: Will Robin come to the party?  
A: That depends.  
Q: Under what conditions will Robin come to the party?  
A: If there is vegetarian food.

Effectively, he reduces conditional answers to simple yes-no questions to a subcase of the when-*q* questions discussed below.

- b. Q: Does John walk? (Groenendijk and Stokhof 1984: 324)  
A: (John walks) If Mary walks.

Second, conditionals can be answers to conditional questions. Since a conditional statement is a biclausal structure, questions can target either the antecedent or the consequent. I will adopt Farr's (2011) terminology of '*what-if-p* question' for a question that targets the consequent (in the case of polar questions this is sometimes written as ' $p \rightarrow ?q$ '). A variety of examples is given below, illustrating both polar questions and *wh*-questions ((108a,b) vs. (108c)), and both indicative and subjunctive questions ((108a,c) vs. (108b)).

(108) *What-if-p questions*

- a. Q: If Alfonso comes to the party, will Joanna leave? (Isaacs and Rawlins 2008: 276)  
A: If he comes, Joanna will leave.
- b. Q: If the weather had been fine, would Jones be wearing his hat? (Ippolito 2013a)  
A: If the weather had been fine, Jones would be wearing his hat.
- c. Q: What happens if I sell an eel? (Farr 2011: 232)  
A: If you sell an eel, you get 2.50 euros.

Farr uses the label '*when-q* question' for a question that targets the antecedent. For each question in (108) a corresponding *when-q* question can be given:

(109) *When-q questions*

- a. Q: When/Under which conditions will Joanna leave?
- b. Q: When/Under which conditions would Jones be wearing his hat?
- c. Q: When/Under which conditions do I get 2.50 euros? (Farr 2011: 232)

Although they do not take the shape of a conditional in a syntactic sense, I shall refer to them as conditional questions because they ask for conditions, and are answered by an *if*-clause. The key point here is that the answers given to the questions in (108) can also be answers to the questions

in (109), but the focus structure will be different. This follows directly from question-answer congruence: the answers to the questions in (108) have focus in the consequent (either focus on ‘will’/‘would’ in the case of polar questions, or on the whole antecedent for *wh*-questions) because they are questions that target the consequent. When they are answers to the questions in (109), the focus is on the antecedent, because the questions target the antecedent.

- (110) a. If Alfonso comes, Joanna [will]<sub>F</sub> leave. [answer to (108a)]  
 b. If you sell an eel, [you get 2.50 euros]<sub>F</sub>. [answer to (108c)]  
 c. If [Alfonso comes]<sub>F</sub>, Joanna will leave. [answer to (109a)]  
 d. If [you sell an eel]<sub>F</sub>, you will get 2.50 euros. [answer to (109c)]

One particular view on counterfactual conditionals and questions under discussion worth mentioning is Ippolito’s (2013a). She claims that counterfactual conditionals are always answers to counterfactual QUDs (or CQUDs): “the counterfactual *if*  $\varphi$ , *would*  $\psi$  is an answer to the CQUD *if*  $\varphi$ ,  $Q$ ?” (p. 199). This is surprising in view of my discussion above: the conditional question Ippolito provides here is a polar when-*q* question, but as I described above a (counterfactual) conditional can equally well be an answer to a number of different types of questions. The focus structure of the conditional in question is crucial for retrieving the type of (C)QUD it answers, but Ippolito does not go into matters of intonation at all. For these reasons, I will not adopt Ippolito’s view, and keep the more general stance that what type of question a conditional answers is determined by congruence in much the same way as it is for syntactically simple questions and answers.

**Conditionals with CT antecedent** As we are interested here in structures in which the antecedent constitutes the contrastive topic, we should look at questions that have focus in the consequent, i.e. what-if-*p* questions.

Recall that the semantic characteristic of contrastive topic is that it constitutes a partial answer to a question.<sup>40</sup> In (103) above I used the conjoined question ‘Where do John and Mary live?’ as a

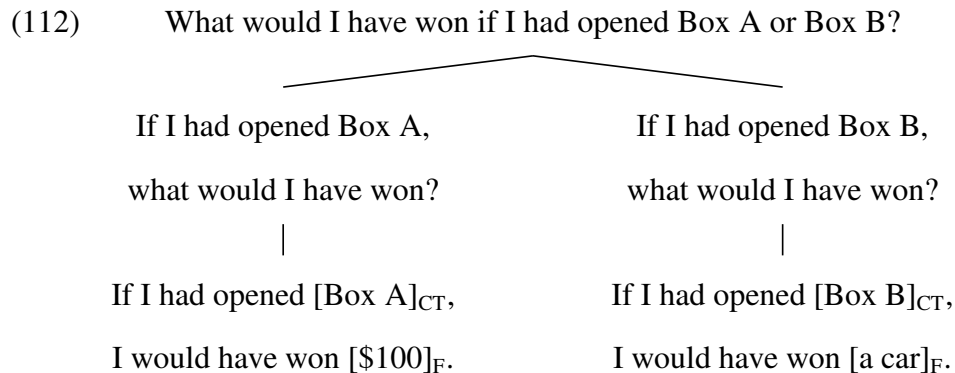
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<sup>40</sup>As I said above, I am talking about contrastive topic as a formal notion defined in terms of questions and answers.

natural question that elicits a partial answer with CT-marking. In the conditional domain, conjoined questions also exist, and we likewise expect them to elicit CT-marked conditional answers. An example of a conjoined what-if-*p* question is given in (111a).<sup>41</sup> We find that the felicitous answer to that question is indeed one in which there is CT-marking in the antecedent, and F-marking in the consequent, as given in (111b).

- (111) a. Q: I opened box C and won nothing, but what would I have won if I had opened Box A or B?
- b. A: If you had opened [Box A]<sub>CT</sub>, you'd have won [\$100]<sub>F</sub>, and if you had opened [Box B]<sub>CT</sub>, you'd have won [a car]<sub>F</sub>.

A conjunctive conditional question like the one in (111a), has a discourse structure with subquestions that are simple conditional questions, as represented in the d-tree in (112).



This tree satisfies CT congruence: the set { ‘If I had opened Box A, what would I have won?’, ‘If I had opened Box B, what would I have won?’ } is the required non-singleton set. Both elements are in the set  $\llbracket U \rrbracket^{ct}$ , which represented as a set of questions, contains items of the form ‘If I had opened *x*, what would I have won?’ for CT-alternatives *x*.<sup>42</sup>

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Whether conditionals constitute topics in the informal sense of topic as ‘what a speaker is talking about’ is an old issue in the literature (Haiman 1978; Schiffrin 1992) that I will not be concerned about.

<sup>41</sup>Here ‘or’ is used instead of ‘and’ to represent a conjunctive interpretation. This is a type of free choice effect with conditionals (see e.g. Zimmermann 2000).

<sup>42</sup>Krifka (1999) uses a different framework, in which the notion of *partial congruent answer* is central. Suppose that *q* and *r* are the only relevant outcomes for a conjunctive conditional question. Then the set of possible answers *S*

## 4.5 Multiple cause contexts

After the review of conditional questions and what it means for a conditional to have contrastive topic in its antecedent, I now pick up the narrative again, and finally move on to showing that the associate of non-local ‘also’ is a contrastive topic. In particular, I was in the process of constructing a conditional counterpart of the pair in (103). One half of the desired conditional parallel we get from the discussion in the previous section: (111) (repeated here as (113)) is a partial conditional answer that is correspondingly marked with CT in the antecedent. The second half of the pair is our key data point, a subjunctive conditional with non-local ‘also’. For convenience however, I present it not by itself, but as the second conjunct in an answer to the conjoined question. This allows for a direct parallel with (113), as can be seen in (114).

(113) If you had opened [Box A]<sub>CT</sub>, you’d have won [\$100]<sub>F</sub>, and if you had opened [Box B]<sub>CT</sub>, you’d have won [a car]<sub>F</sub>.

(114) If you had opened Box A, you’d have won \$100, and if you had opened Box B, you’d ALSO have won \$100.

Let us compare (113) and (114) on the same two grounds that (103a) and (103b) were compared: intonation and semantics.

The case of intonation is straightforward: not only is the prosodic similarity between (113) and (114) apparent on informal hearing, it is also clear when we look at Figure 1 (page 41). We see the CT-marking contour in the antecedent. Note that the evidence from prosody is thus twofold: both the stress on ‘also’ and the CT-marking on the antecedent are signs that we have a situation parallel

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is as follows:

$$\begin{array}{lll} \{p_1 \rightarrow q \wedge p_2 \rightarrow r, & p_1 \rightarrow r \wedge p_2 \rightarrow q, & p_1 \rightarrow q \wedge p_2 \rightarrow q, \\ p_1 \rightarrow r \wedge p_2 \rightarrow r, & p_1 \rightarrow q \wedge p_2 \rightarrow (q \wedge r), & p_1 \rightarrow r \wedge p_2 \rightarrow (q \wedge r), \\ p_1 \rightarrow (q \wedge r) \wedge p_2 \rightarrow q, & p_1 \rightarrow (q \wedge r) \wedge p_2 \rightarrow r, & p_1 \rightarrow (q \wedge r) \wedge p_2 \rightarrow (q \wedge r)\} \end{array}$$

Then, according to Krifka’s (1999: 120) definition, an answer like  $p_1 \text{CT} \rightarrow q_F$  is a partial congruent answer to that question:  $p_1 \rightarrow q$  and  $p_1 \rightarrow r$  are both entailed by an answer in  $S$ , every answer in  $S$  entails either  $p_1 \rightarrow q$  or  $p_1 \rightarrow r$ ,  $p_1 \rightarrow q$  does not entail any answer in  $S$ , and  $p_1 \rightarrow q$  and  $p_1 \rightarrow r$  differentiate, i.e. the answers in  $S$  that entail the one are not the same as those that entail the other.





- (116) If you had opened [Box A]<sub>CT</sub>, you'd have won [\$100]<sub>F</sub>, and **if you had opened [Box B]<sub>CT</sub>, you'd [also]<sub>F</sub> have won \$100.**

In our original example of non-local 'also' in (41b), only the second conjunct (here in bold face) is pronounced, with the first conjunct being part of the understood context. In either case, when non-local 'also' appears in the consequent of a subjunctive conditional, its associate is a contrastive topic.

**Multiple cause contexts** The importance of our conclusion is revealed once we combine it with a result from chapter 3. There I concluded that non-local 'also' takes an associate in the antecedent clause. This thus means that conditionals with non-local 'also' have a contrastive topic in their antecedent.

The position of contrastive topic inside the conditional (i.e. antecedent or consequent) is important because it correlates with the position in which alternatives are generated. When the alternatives are generated for (a part of) the antecedent, we have the following situation:

- (117) 'if  $p_1$ , then  $q$ ', 'if  $p_2$ , then  $q$ ', 'if  $p_3$ , then  $q$ ' ... where  $p_1, p_2, p_3, \dots$  are the result of different alternatives for the CT-marked constituent (e.g. opening Box A, opening Box B, etc.)

Since this corresponds to a discourse in which the conditionals answer subquestions that ask about different antecedents for the same consequent, I will call such contexts **multiple cause contexts**.

- 
- (iii) a. What will happen in these ten scenarios?  
b. #What will happen for these ten reasons?

These data illustrate that asking about alternative or additional antecedents in a conditional is possible, but asking about other reasons in a *because*-clause is not. Further independent evidence comes from languages that mark CT by morphology instead of by intonation alone as in English. Constant argues that the Mandarin Chinese suffix *-ne* marks CT, and he cites data that show that Mandarin *because*-clauses and factive conditionals resist *-ne*, but hypothetical *if*-clauses typically carry *-ne* (see Constant 2014, §6.3.6 for data and discussion).

I can add one more piece of evidence to the claim that *because*-clauses resist CT. Given that postposed 'also' associates with contrastive topic, we predict that *because*-clauses do not allow stressed 'also'. This prediction is borne out. Suppose that there are two reasons for why we're going swimming today. Then I cannot utter (iv):

- (iv) #Because it's really warm today, we're going swimming. And because the pool is open, we are ALSO going swimming.

Before I give a definition of multiple cause contexts, it may be instructive to contrast this case with *local* ‘also’. Recall that local ‘also’ takes an associate inside the consequent clause, and hence focus alternatives are generated inside the consequent.

(118) ‘if  $p$ , then [...  $q_1$  ...]’, ‘if  $p$ , then [...  $q_2$  ...]’, ‘if  $p$ , then [...  $q_3$  ...]’, where  $q_1, q_2, q_3, \dots$  are the result of different alternatives for the associate of local ‘also’ (e.g. winning \$100, winning a laptop, etc.)

This is *not* a multiple cause context, because here we have a single cause (namely  $p$ ), and we consider different outcomes for  $p$ , such as winning different prizes. Anticipating on the crucial role multiple cause contexts will play in the remainder of the analysis, in chapter 6 I will show that multiple cause contexts are contexts that cancel  $CF_q$ . Hence, we obtain an explanation for why the contrast between local and non-local ‘also’ as in (117) and (118) results in a difference with respect to their ability to cancel  $CF_q$ .

(119) *Definition*

A context  $C$  is a **multiple cause context** if more than one cause for the same consequent is salient in  $C$ .

The reader may find it helpful to have a schematic graphical representation of a multiple cause context in terms of *causal diagrams* (see e.g. Pearl 2000):

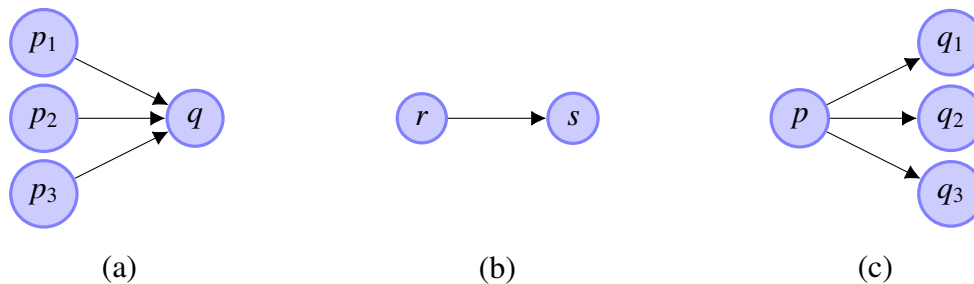


Figure 3. Three causal diagrams. (a) is a multiple cause context, (b) and (c) are not.

Some notes about the definition of multiple cause contexts as stated in (119) are in order. The

definition does not provide a precise technical definition of ‘cause’. I am using the term loosely here, and although I realize that may upset certain readers, it seems to me to be the most suitable term (for example, I could have used the term ‘multiple-antecedent context’ instead, but that might give the misleading impression that we have multiple syntactic antecedents rather than different causes that are salient as alternatives in the context). I acknowledge the fact that this definition leaves some philosophically interesting and substantive questions unanswered, such as ‘When does something count as a cause?’ and ‘When do two causes count as distinct?’. I leave these questions aside as somewhat orthogonal to the linguistic issues under discussion in this dissertation. Let me just point out that from a linguistic perspective we are dealing with regular (context-sensitive) focus alternatives. The general requirements for when two focus alternatives count as distinct apply in this case as well.

We have seen that it is the generation of alternatives in the antecedent of a conditional that results in a multiple cause context (see (117) vs. (118)). The attentive reader may have noticed that since focus marking also generates alternatives, contrastive topic is not the only way to get a multiple cause context. When there is a constituent in the antecedent that is F-marked, and we have identical consequents, we should get another multiple cause context:

(120) (if ... [X1]<sub>F</sub>..., Y), and (if ... [X2]<sub>F</sub>..., Y)

I will now turn to these sorts of contexts by addressing one other important feature of postposed stressed additive particles: their obligatory nature.

## 4.6 Obligatory additive particles

One of the most discussed aspects of postposed stressed additive particles in the literature is that such particles are in some sense *obligatory* (Kaplan 1984; Krifka 1999; Sæbø 2004; Amsili and Beyssade 2010; Winterstein 2011; Winterstein and Zeevat 2012 and references therein). For example, when we leave out stressed ‘too’ in sentence (103b) (repeated below) but, crucially, keep its CT-F-intonation fixed, it is no longer acceptable:

- (121) a. # $[\text{John}]_{\text{CT}}$  lives in  $[\text{France}]_{\text{F}}$ , and  $[\text{Mary}]_{\text{CT}}$  lives in  $[\text{France}]_{\text{F}}$ .  
 b.  $[\text{John}]_{\text{CT}}$  lives in  $[\text{France}]_{\text{F}}$ , and  $[\text{Mary}]_{\text{CT}}$  lives in France  $[\text{too}]_{\text{F}}$ . (= (103b))

This illustrates a constraint in natural language that restricts the occurrence of two identical F-marked constituents (here ‘France’) in conjoined sentences.<sup>44</sup> Although there is no established name for this constraint as far as I know, I will refer to it as the ‘Repeated Focus Constraint’ (RFC) for ease of reference.<sup>45</sup>

- (122) *Repeated Focus Constraint* (RFC) (informal version)  
 $\#[\dots \text{CT}_1 \dots \text{Foc}_1 \dots] \wedge [\dots \text{CT}_2 \dots \text{Foc}_2 \dots]$  with  $\text{Foc}_1 = \text{Foc}_2$

As I pointed out above, the data that have been used in earlier literature to argue for the Contrastive Topic Hypothesis are syntactically simple sentences like (121b), and the same data have been used in discussions on the RFC in (122). However, we can easily verify that the constraint holds equally well for conditional sentences that have a CT-F structure. Example (123a) shows that without ‘also’ the sentence is unacceptable, and sentence (123b) shows that adding ‘also’ rescues it.

- (123) a. #If you had opened  $[\text{Box A}]_{\text{CT}}$ , you’d have won  $[\$100]_{\text{F}}$ , and if you had opened  $[\text{Box B}]_{\text{CT}}$ , you’d have won  $[\$100]_{\text{F}}$ .  
 b. If you had opened  $[\text{Box A}]_{\text{CT}}$ , you’d have won  $[\$100]_{\text{F}}$ , and if you had opened  $[\text{Box B}]_{\text{CT}}$ , you’d  $[\text{also}]_{\text{F}}$  have won \$100.

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<sup>44</sup>The two focused constituents do not have to be identical, it is enough for the constraint to be violated if there is a relation of entailment. For example, living in Paris entails living in France, which results in the following sentence having the same violation as (121):

- (i)  $[\text{Where do John and Mary live?}]$   
 $\#[\text{John}]_{\text{CT}}$  lives in  $[\text{Paris}]_{\text{F}}$ , and  $[\text{Mary}]_{\text{CT}}$  lives in  $[\text{France}]_{\text{CT}}$ .

For simplicity I will only consider cases with identical focus values, although nothing in the upcoming discussion hinges on that. I refer the reader to Winterstein (2011) for discussion of these additional cases.

<sup>45</sup>Jesse Harris (p.c.) asks if it is required that the two identical constituents must be F-marked, observing that the following variant of (121a) is equally bad:

- (ii)  $\#[\text{John}]_{\text{CT}}$  lives in  $[\text{France}]_{\text{F}}$ , and  $[\text{Mary}]_{\text{CT}}$  lives in France.

I believe, however, that there is an independent explanation available for the infelicity of (ii). This explanation relates to a violation of question-answer congruency in the second conjunct (‘France’ should be F-marked as an answer to the subquestion ‘Where does Mary live?’).

Note, however, that at this point we cannot exclude the possibility that (123a) is unacceptable for a different reason, for example relating to  $CF_q$ . To be certain, we check indicative conditionals too:

- (124) a. #If you take [Route A]<sub>CT</sub>, you will end up in [New York]<sub>F</sub>, and if you take [Route B]<sub>CT</sub>, you will end up in [New York]<sub>F</sub>.
- b. If you take [Route A]<sub>CT</sub>, you will end up in [New York]<sub>F</sub>, and if you take [Route B]<sub>CT</sub>, you will ALSO end up in New York.

Although it has been noted (e.g. [Amsili and Beyssade 2010](#)), it is rarely emphasized that intonation plays a crucial role in whether or not these additive particles are indeed obligatory. For example, in a different context, sentence (121a) with the exact same words, but a different intonation, is perfectly fine:

(125) Q: Who lives in France?

A: [John]<sub>F</sub> lives in France, and [Mary]<sub>F</sub> lives in France.

We can call this an *exhaustive focus* reading, because it implies that John and Mary are the only (relevant) individuals who live in France.

A second intonational pattern that licenses sentences like (121a) is *listing* intonation (characterized by a H-L% boundary tone in ToBI).<sup>46</sup>

(126) Very many of my friends live in France:

John lives in France, Mary lives in France, Peter lives in France, ...

H-L%

H-L%

H-L%

Here, the high boundary tone at the end of each listed constituent indicates that the answer is non-exhaustive: John, Mary and Peter are among many of my friends who live in France.

Since we saw that the RFC holds for conditional sentences, we predict that conditionals with different discourse structures than in (123a) are felicitous. Indeed they are:

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<sup>46</sup>The notation H-L% gives the impression of a falling tone at the end of the intonational phrase (see the ToBI footnote 34 on page 72). However, due to the phenomenon of *upstep* after H- (see e.g. [Ladd 2008](#): 103), the marking H-L% actually represents a high plateau accent.

(127) [I didn't win \$100, but how could I have won \$100?]

If you had opened [Box A]<sub>F</sub>, you'd have won \$100, and if you had opened [Box B]<sub>F</sub>, you'd have won \$100.

This is a conditional counterpart of (125). Observe that although it is an answer to a when-*q* question, it is still a multiple cause context, as there are focus alternatives generated in the antecedent. Also (126) has a conditional counterpart:

(128) [context: there is a large number of boxes that has a \$100 prize]

If you had opened Box A, you'd have won \$100, and if you had opened Box B,  
H- L% H-  
you'd have won \$100, and ...  
L%

The attentive reader will recognize this as the same structure as the listing contexts from the 'third class' of  $CF_q$ -cancellation contexts from chapter 2. There I mentioned example (33) (listing many times to see a falling star), and in the preview I had example (6) (listing many salespersons to get a deal). By studying  $CF_q$ -cancellation contexts with 'also' we have thus obtained a more general result in which we can also identify contexts like (127) and (128) as multiple cause contexts. This was possible because of the parallel I drew with the theory of postposed stressed additive particles, in which exhaustive focus and listing contexts came up as contexts that license violations of the RFC (as in (125) and (126)). I will come back to the listing data in section 6.4, after I have explained the link between multiple cause contexts and conditional perfection.

First, in section 4.7, I will show how the pragmatic theory for the RFC that Krifka (1999) proposes extends to conditionals.

#### 4.7 Obligatoriness of 'too': Krifka and Sæbø

I now proceed to discussing theoretical accounts of why additive particles are required in contexts such as (102), repeated below, and apply to them to conditionals.

(129) Where do John and Mary live?

John<sub>CT</sub> lives in France, and Mary<sub>CT</sub> lives in France \*(too<sub>F</sub>).

I will discuss two accounts, [Krifka \(1999\)](#) and [Sæbø \(2004\)](#), that arguably have been most influential.<sup>47</sup> In general, these accounts will have to answer two questions: why the version of (129) without ‘too’ is infelicitous, and why the version with ‘too’ makes it felicitous. In order to facilitate the discussion, I will discuss these two questions in that order in the upcoming review.

Krifka’s story about (129) goes as follows. Leaving out ‘too’ in (129) is infelicitous because it violates a pragmatic condition, the Distinctiveness Condition, which derives from the Gricean maxim of Manner:<sup>48</sup>

(130) *Distinctiveness Condition* ([Krifka 1999](#))

If [...*T*<sub>CT</sub> ...*C*<sub>F</sub> ...] is a contrastive answer to a question *Q*, then there is no alternative *T'* of *T* such that the speaker is willing to assert [...*T'* ...*C* ...].

The motivation for this principle is that the conjunction [...*T* ∧ *T'* ...*C* ...] would be shorter (and thus preferred by Manner) than [...*T* ...*C* ...] ∧ [...*T'* ...*C* ...]. So, for example, ‘John and Mary live in France’ is the preferred answer to the question in (129). It may be helpful to note that (130) is very similar in spirit to the idea that *T*<sub>CT</sub> generates an *exclusivity implicature* (this is [Sæbø’s 2004](#) terminology, to be discussed below), e.g. in (129) the implicature that ‘only John lives in France’.

Why is the version with ‘too’ felicitous? [Krifka](#) claims that the additive particle “allows to violate Distinctiveness” (p. 125). How this works is as follows. The contrastive topic intonation in the first conjunct indicates that ‘John lives in France’ is only a partial answer to the question, giving rise to an implicature that Mary does not live in France. At this point (after the first conjunct)

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<sup>47</sup>There have been some later proposals, but they have been worked out in considerably less detail. For example, [Amsili and Beyssade \(2010\)](#) derive the obligatoriness of ‘too’ from a scalar implicature based on the Horn scale (too, ∅). The main problem is to explain why this scale would exist in the first place, a problem to which [Amsili and Beyssade](#) admit not to have a good answer (both [Krifka 1999](#) and [Rullmann 2003](#) assume that the alternative to ‘too’ is negation).

<sup>48</sup>I have made some changes to Krifka’s notation. Krifka, confusingly, talks about ‘comment focus’ and ‘topic focus’, denoted *C*<sub>F</sub> and *T*<sub>F</sub>, respectively. His ‘topic focus’ corresponds with the CT-accent on the contrastive topic, while the ‘comment focus’ is the regular focus marking ([·]<sub>F</sub>) that corresponds with the *wh*-element in the question.



Krifka claims that the current Question under Discussion is ‘Do John and Mary live in France?’. ‘Mary<sub>CT</sub> lives in France, too<sub>F</sub>’ is a good answer to the polar QUD because it focuses ‘too’, which is a type of polarity item that has sentential negation and covert affirmation as its alternatives. Formally, it counts as a ‘contrastive’ answer to the QUD (Krifka formalizes this in his system that I referred to in footnote 42 on page 82). One condition on contrastive answers is that a conjunction of several contrastive answers constitutes a complete answer to the question (p. 121). The intended conjunction is as follows (where AFF is covert affirmation):

(131) [John lives in France AFF] and [Mary lives in France, too].

So, in summary ‘too’ allows the speaker to violate the Distinctiveness Condition because it “explicitly states the discourse relation” (p. 125), namely affirmative assertion. The sequence of questions and answers summarized below:

(132)	QUD + Answer	(what the theory has to say)
	<hr/>	
	(Where do John and Mary live?)	
	<b>John<sub>CT</sub> lives in France<sub>F</sub> ...</b>	(continuation ‘Mary <sub>CT</sub> lives in France <sub>F</sub> ’ disallowed because of distinctiveness)
	(Do John and Mary live in France?)	
	<b>... and Mary<sub>CT</sub> lives in France, too<sub>F</sub>.</b>	(as it’s now a polar QUD, we need focus on a polarity item such as ‘too’)

**Sæbø (2004)** Sæbø (2004) argues against Krifka by pointing out the implicit assumption in Krifka’s reasoning that the presupposed alternative of ‘too’ must be a contrastive topic (‘John<sub>CT</sub>’ in (132)). Sæbø presents data that show that this is an unwarranted assumption: in many cases, the presupposed alternative of ‘too’ is not a contrastive topic. This seems problematic for Krifka: if ‘John’ is not a CT, the first conjunct does not violate the distinctiveness condition, so there seems no reason why the continuation without ‘too’ is ruled out (later on, I will question this point by

Sæbø). He agrees with Krifka, however, that the *associate* of ‘too’ (‘Mary’ in (132)) is always a contrastive topic, and hence his story is that it is the *associate* (in the second conjunct) that generates the contrastive implicature, not the presupposed alternative. This explains that just saying ‘Mary<sub>CT</sub> lives in France’ as the second conjunct in (129) is infelicitous: it implicates that only Mary lives in France, which contradicts the previous statement. So Sæbø’s explanation of the obligatoriness of ‘too’ is opposite to that of Krifka: according to Krifka it was the first clause in (129) that generated a contrastive implicature which then caused problems, according to Sæbø it is the second clause that generates the problematic implicature.

To explain why adding ‘too’ makes it felicitous, Sæbø needs to explain how that move removes the problematic contrastive implicature. With a standard semantics of ‘too’ this would be difficult: the assertion that John lives in France is incompatible with the exclusivity implicature triggered by ‘Mary<sub>CT</sub>’ in the second sentence that only Mary lives in France. Hence, Sæbø provides the following revised denotation for ‘too’ (I changed Sæbø’s DRT-style notation to something more common):

$$(133) \quad \mathbf{too} = \lambda\varphi : \exists\alpha\varphi[T(\varphi)/\alpha].\varphi[T(\varphi)/(\alpha \oplus T(\varphi))]$$

This version of ‘too’ is a propositional operator: it takes a proposition  $\varphi$  and returns another proposition. The operator  $T$  assigns to a proposition the topic of that proposition (i.e.  $T(\varphi)$  is the topic of  $\varphi$ ), and the ‘ $[x/y]$ ’ notation designates substituting  $y$  for  $x$ . The topic  $T(\varphi)$  is assumed to be of the same type as the presupposed alternative  $\alpha$ .<sup>49</sup> The key innovation in (133) is that the assertion of ‘too  $\varphi$ ’ replaces the topic of  $\varphi$  with ‘ $\alpha \oplus T(\varphi)$ ’, i.e. the sum of the presupposed alternative and the topic. Applied to (129), this gives:

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<sup>49</sup>Notice there is a small technical problem in Sæbø’s definition:  $\alpha$  is existentially bound in the presupposition, but should also be bound in the assertion

- (134) ... Mary<sub>CT</sub> lives in France too. ( $\varphi = \text{Mary lives in France}, T(\varphi) = \text{Mary}$ )
- presupposes: there is some  $\alpha$  such that  $\alpha$  lives in France (context provides  $\alpha = \text{John}$ )
- asserts (Sæbø): lives-in-France( $\text{John} \oplus \text{Mary}$ )
- asserts (standard theory): lives-in-France(Mary)

Sæbø's assertion now no longer generates a problematic contrastive implicature: 'only John and Mary live in France' does not contradict 'John lives in France' from the previous statement.

## 4.8 Back to conditionals

Although Sæbø's (2004) proposal is newer, and was designed to fix weaknesses in Krifka's (1999) account, I can see two problems with it. First, although Sæbø pointed out that in many naturally occurring cases the presupposed alternative of an additive particle is not a contrastive topic, he did not mean to claim that this holds for *all* cases: it is clear that there are also instances in which the presupposed alternative *is* a contrastive topic (see simple examples like (129)). In that case, the presupposed alternative gives rise to an exclusivity implicature (for example that 'only John lives in France' in (129)). The problem is that the second clause then has a conflicting implicature: in (129), 'only John and Mary live in France' contradicts with 'only John lives in France'. So while Sæbø criticized Krifka for not being able to deal with cases in which the presupposed alternative of 'too' is *not* CT, Sæbø's own theory has a problem with cases in which the presupposed alternative of 'too' *is* CT.

The second and more worrying problem concerns Sæbø's use of the operator  $\oplus$ . The idea is that in a discourse like (129), the topic 'grows' from 'John' to 'John  $\oplus$  Mary', something Sæbø calls an *aggregate contrastive topic* (p. 214). I assume that  $\oplus$  is a sum operator in the sense of Link (1983), but this has the problem that it fails to work once we widen our view to cases that do not just involve the addition of simple entities of type  $e$ .

The problem is that because of the substitution of  $T(\varphi)$  with  $\alpha \oplus T(\varphi)$ , the new aggregate topic is

necessarily interpreted with narrow scope in the original position of  $T(\varphi)$ . Consider the following variant of (129), in which, as expected, the additive particle is also obligatory:

(135) (How much do John and Bill weigh?)

John<sub>CT</sub> weighs 75 kg. Bill<sub>CT</sub> weighs 75 kg, \*(too<sub>F</sub>).

According to Sæbø, the second sentence would assert ' $W(j \oplus b)$ ', where  $W$  is the predicate 'weighs 75 kg'. Now clearly this needs to be interpreted *distributively*, an important detail that Sæbø doesn't discuss. The problem becomes even more pressing once we move to conditionals (or any other type of intensional construction). Sæbø's theory would compute the assertion of our familiar conditional example as follows:

(136) If you had opened [Box A]<sub>CT</sub>, you would have won \$100, and if you had opened [Box B]<sub>CT</sub>, you would [also]<sub>F</sub> have won \$100.

the second conjunct asserts: if  $[\alpha \oplus T(\varphi)]$ , you would have won \$100

where  $\alpha$  = you opened Box A,  $T(\varphi)$  = you opened Box B

This is clearly not correct. We don't know how  $\oplus$  is defined to operate on propositions (if it meant conjunction, (136) would incorrectly claim that you (only) win \$100 if you open Box A AND Box B together). More importantly, it could not have the distributive interpretation of the type ' $p_1 \rightarrow q$  and  $p_2 \rightarrow q$ '. The conjunctive conditional question that (136) answers should be answered by a conjoined answer. But an  $\oplus$  operator inside the antecedent of the second conjunct cannot, in general, denote a conjoined answer.<sup>50</sup> Whereas the problem I identified in (135) might perhaps be worked out formally in the domain of individuals, I do not see how this could be done for the more difficult case of (136). For this reason I will reject Sæbø's (2004) theory, and return to Krifka (1999).

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<sup>50</sup>One might think of a conjunctive question as a speech act conjunction of question acts (as in Krifka 2001), which is answered by a conjunction of answer acts. Stated in those terms, the problem with the  $\oplus$  operator inside the antecedent of the second conjunct is that it cannot have the effect of speech act conjunction.

**Sæbø's (2004) criticism** First, I should stress that the present problem – that a theory should account both for presupposed alternatives that are CT-marked and for ones that aren't – also pertains to my conditional data. For expository reasons I have been discussing a lot of examples with game shows and boxes, of which sentences like (123b), repeated here, indeed contain a CT-marked presupposed alternative (here 'Box A').

(137) If you had opened [Box A]<sub>CT</sub>, you'd have won [\$100]<sub>F</sub>, and if you had opened [Box B]<sub>CT</sub>, you'd [also]<sub>F</sub> have won \$100. (repeated from (123b))

However, there are many cases in which the presupposed alternative (i.e. another cause for *q*) is not uttered in the same sentence, or even not uttered at all, but clear from context. Here is one example:

(138) A: We are on time because we have taken the road I said we should take.

B: If we had taken the other road, we would ALSO have been here in time.

There is no CT-marking on 'the road I said we should take', so the problem exists for conditional sentences just like it does for the simple sentences studied by Krifka and Sæbø.

I would like to argue that Sæbø's criticism of Krifka can be rebutted. The criticism, in brief, was that for Krifka, a violation of the distinctiveness condition is necessary to explain why the version without 'too' is infelicitous, but there is not always such a violation. I claim that within Krifka's theory there is an alternative explanation available for why the version without 'too' is infelicitous, an explanation that does not depend on distinctiveness. Looking back at (132), we saw that the continuation 'and Mary<sub>CT</sub> lives in France<sub>F</sub>' after the first conjunct violates the distinctiveness condition in (130). But there is a second problem with that continuation. After the utterance of the first conjunct, the QUD has changed to "Do John and Mary live in France?" (see (132)), and the continuation is not a congruent answer to that question:

(139) Do John and Mary live in France?

#Mary<sub>CT</sub> lives in France<sub>F</sub>.

The problem is that the answer is not a congruent answer: the F-marking in the answer does not correspond with what the question asks, but rather with material that is given ('France'). This second problem with the continuation persists in the case in which 'John' does not have CT-marking. So, in parallel to (132), we now have this new tableau for cases in which the presupposed alternative is not a contrastive topic:

(140)	QUD + Answer	(what the theory has to say)
	<b>John lives in France ...</b>	(no problem with distinctiveness)
	new QUD: (Do John and Mary live in France?)	
	<b>... and Mary<sub>CT</sub> lives in France, too<sub>F</sub>.</b>	(continuation 'Mary <sub>CT</sub> lives in France <sub>F</sub> ' disallowed because it is not a congruent answer to the new QUD)
		(version with 'too' is allowed because it counts as a congruent answer to the new QUD)

This concludes my discussion of how the theory of postposed stressed additive particles applies to conditionals. While there remain some formal details to be filled in (for instance [Krifka \(1999\)](#) does not explain how the change of QUD in (132)/(140) happens, or how we can diagnose it), I hope I have convinced the reader that my proposal shows how [Krifka's](#) theory can be extended to conditionals. This is a reassuring conclusion given the many empirical parallels I have identified in this chapter between postposed stressed additive particles and conditionals with non-local 'also'.

Since this discussion about [Krifka \(1999\)](#) and [Sæbø \(2004\)](#) has diverted us somewhat from the main thread, I will give an interim summary below, stating what we have done so far, and what will follow next. Some remaining relevant observations about postposed stressed additive particles are given in the two appendices [4.A](#) and [4.B](#). The narrative is then picked up again in chapter [5](#).

**Interim summary** After an empirical investigation of  $CF_q$ -cancellation contexts (chapter 2), I first discussed the contexts with ‘also’ (called “class 1” in chapter 2). I showed that only non-local ‘also’ cancels  $CF_q$  (chapter 3). In the current chapter, it became clear how the focus association of ‘also’ depends on the causal structure of the discourse: only when alternatives are generated for a constituent within the antecedent, do these alternatives function as separate causes for the same consequent (see (117) and section 4.5). The proposed empirical generalization is that  $CF_q$ -cancellation contexts are *multiple cause contexts*, as defined in (141) (repeated from (119)).

(141) *Definition*

A context  $C$  is a **multiple cause context** if more than one cause for the same consequent is salient in  $C$ .

This characterization not only holds for conditionals with non-local ‘also’, but in this chapter has also been applied to listing contexts and exhaustive focus contexts. These contexts do not require an additive particle like ‘also’, because their discourse configuration does not violate the Repeated Focus Constraint (see (122) and section 4.6). In chapter 7 I will show that  $CF_q$ -cancellation contexts involving the aspectual particle ‘still’ (“class 2” in chapter 2) can be shown to be multiple cause contexts as well.

What is still to be shown is how multiple cause contexts affect the generation of the  $CF_q$  inference. The theoretical connection between the two will be made in chapter 6, where I introduce the pragmatic phenomenon of *conditional perfection* (the strengthening of conditionals to biconditionals). In particular, I will argue for the following claim:

(142) *Restriction on conditional perfection*

Conditionals in multiple cause contexts do not trigger conditional perfection.

Deriving restrictions on conditional perfection is an important theoretical step, given the specific implementation of the generation of  $CF_q$  I adopt. I follow an idea by Karttunen (1971), which can be summarized in the following schema (given before in chapter 1):

(143) *Karttunen's schema* (first version, to be revised)

(Karttunen 1971)

Utterance:  $p \rightarrow q$

Implicatures:

$\neg p$  (counterfactuality of  $p$ )

$\neg p \rightarrow \neg q$  (conditional perfection on  $p \rightarrow q$ )

---

$\neg q$  (by Modus Ponens)

Since conditional perfection is a necessary ingredient for  $CF_q$  to arise, any restriction on conditional perfection, such as (142), implies a restriction on the generation of  $CF_q$ . Hence, the argument goes that if a conditional is uttered in a multiple cause context  $C$  (see (141)), it does not trigger conditional perfection (see (142)), and therefore the schema in (143) breaks down, so that the  $CF_q$  inference is not triggered.

#### 4.A Appendix: *Also* and *too*

Most of the literature on postposed additive particles considers ‘too’, while my claims were mostly based on ‘also’. Here I will discuss some differences between ‘also’ and ‘too’ to take away any potential objection that this difference may weaken the validity of my conclusions. I presume that the reason that authors tend to focus on ‘too’ rather than ‘also’ is because of its simpler syntax: ‘too’ is obligatorily postposed, whereas ‘also’ can also function as a regular focus particle that precedes its focus. As far as I can see, in most contexts being used to show that ‘too’ is obligatory, ‘also’ can be used equally well:

(144) Where do John and Mary live?

- a. [John]<sub>CT</sub> lives in [Paris]<sub>F</sub>, and [Mary]<sub>CT</sub> lives in Paris, [too]<sub>F</sub>.
- b. [John]<sub>CT</sub> lives in [Paris]<sub>F</sub>, and [Mary]<sub>CT</sub> [also]<sub>F</sub> lives in Paris.
- c. [John]<sub>CT</sub> lives in [Paris]<sub>F</sub>, and [Mary]<sub>CT</sub> lives in Paris [also]<sub>F</sub>.



Other authors have also reached the conclusion that on a semantic level, ‘too’ and ‘also’ behave the same (e.g. [Rullmann 2003](#): 339). That being said, there are some differences between ‘also’ and ‘too’ that are worth taking note of, especially given that remarkably little seems to have been said about such differences.

Along with the syntactic differences come differences with the scopal behavior with respect to negation (see [Rullmann 2003](#) for further discussion):

- (145) a. John didn’t cook the food, and he didn’t wash the dishes either/\*?too.  
b. John didn’t cook the food, and he also didn’t wash the dishes.

[Taglicht \(1984\)](#) and [Gast \(2006\)](#) report on corpus studies and discuss some stylistic differences between ‘also’ and ‘too’. [Gast](#) also mentions one semantic difference. The semantic difference arises in contrastive topic-focus structures in which the additive particle associates with two sets of alternatives:

- (146) A: I love you. ([Gast 2006](#): 172)  
B: I love you TOO.  
#B’: I also love you.

Here both the subject and the object range over {speaker, addressee}. [Gast](#) claims (146B’) is deviant “with an unmarked intonation contour and only one stress position” (p. 172), leading him to the generalization in (147):

- (147) Additive particles can occur only to one side of the added material. ([Gast 2006](#): 172)

Intonation is of course crucial here, as a multiple focus construction (‘[I]<sub>F</sub> also love [you]<sub>F</sub>’) would make a felicitous answer to (146A). Observe that the ‘doubly-alternative’ contexts as in (146) do not arise in my data with conditionals, so these complications can be safely ignored.

[Kaplan \(1984: 511n\)](#) mentions another difference:

- (148) a. Jo had fish and Mo had soup also.  
b. \*Jo had fish and Mo had soup too.

The intended reading, that Mo had fish and soup, is supposed to be unavailable for ‘too’ (but [Krifka 1999](#): 127n7 seems to disagree with this judgment).

#### 4.B Appendix: linearity and stress on ‘also’

It has generally been assumed that there is a strict correspondence between the linear order between additive particles and their associate on the one hand, and the stress pattern on the other hand:

- (149) *Postposed stressed hypothesis*

Additive particles are stressed when they follow their associate.

[Krifka \(1999: 111\)](#) writes “additive particles may follow [their associate], in which case they get stressed”. [Rullmann \(2003\)](#) introduces the terminology ‘right-hand particle’ and ‘left-hand particle’, which by itself already reflects the role of linear order. He writes:

*Also* can precede or follow its associate; when it precedes, it is unstressed, and its associate has a falling pitch accent. When it follows its associate, the associate bears a rising pitch accent and *also* itself is marked by a falling pitch accent. ([Rullmann 2003](#): 371)

My data with ‘also’ and sentence-final *if*-clauses have ‘also’ preceding its associate, yet it is still stressed, conflicting with (149).

- (150) We would ALSO have been here in time if you had taken the other road. (= (63a))

*If*-clauses are not alone in licensing the stress pattern in (150). There are other subordinating connectives that pattern with conditionals, such as temporal ‘while’ (see [Haegeman 2003](#) for discussion). We find a similar pattern there:

- (151) A: While her daughter is sleeping, Mary has time to write her book.  
B: While her SON is sleeping, Mary ALSO has time to write her book.  
B': Mary ALSO has time to write her book while her SON is sleeping.  
B'': Mary has time to write her book while her SON is sleeping, TOO.

This suggests that the pattern is typical of a wider class of adjunction structures. The data in (150) and (151) call for a thorough re-evaluation of the postposed stressed hypothesis in (149). At best, these data show that we have to replace ‘follow’ in (149) by a more complicated syntactic notion, because we now consider cases such as (150) that involve multiple clauses and operations like reconstruction. On the other hand, we may have to reject (149) altogether as a valid generalization.

Let me finish by making a few suggestions of how the postposed stressed hypothesis could be investigated further. Not all works on postposed stressed additive particles give an explanation of (149), for example [Sæbø \(2004\)](#) is primarily interested in the obligatoriness of additive particles. [Krifka \(1999\)](#), however, provides an explanation of why ‘too’ (or ‘also’) gets stress: it is the focused element in a CT-Focus structure, because it is a congruent answer to a polar question (see the discussion in section 4.7). He draws a parallel between (152a) and other possible answers to the polar question that the second conjunct answers. These, given as (152b,c,d) have a similar intonation pattern:

- (152) a. (John lives in France, and) Mary ALSO lives in France.  
b. ...Mary DOES live in France. (based on [Krifka 1999](#): 124)  
c. ...Mary DOESN'T live in France.  
d. ...Mary CERTAINLY lives in France.

While explaining why the additive particle gets stress, Krifka is not completely clear on how this relates to the linear order of particle and associate. I presume that his explanation would relate to (English) word order tendencies that contrastive topics are usually sentence-initial (cf. [Krifka](#)

1999: 115). However, since Krifka's paper from 1999, there has been a lot of empirical work on contrastive topic, discussed at length in Constant (2014). He points out that both the CT+Focus and Focus+CT orders are attested.<sup>51</sup> Here is an example of the latter (based on Constant 2014: 20):

- (153) Who brought the wine and the beer?
- a. John<sub>F</sub> brought the wine<sub>CT</sub>, and Mary<sub>F</sub> brought the beer<sub>CT</sub>.
  - b. #John<sub>F</sub> brought the wine<sub>CT</sub>, and John<sub>F</sub> brought the beer<sub>CT</sub>.
  - c. John brought the wine, and John also brought the beer.

These show the expected properties of CT structures, including the now familiar constraint in (153b) that requires an additive particle as in (153c). Now, in (153c) I have constructed an example in which 'also' associates with a CT-marked constituent 'the beer', but one that *follows* 'also'. As far as I know such cases have not been investigated in the additive particles literature. Crucially, however, they provide a great test case for (149), because we can now construct a minimal example in which the discourse structure (i.e. CT/F structure) is different, but the linear order is not:

- (154) a. Who brought the wine and the beer?  
John<sub>F</sub> brought the wine<sub>CT</sub>, and John also brought the beer<sub>CT</sub>.
- b. What did John bring?  
John brought the wine<sub>F</sub>, and John also brought the beer<sub>F</sub>.

Krifka's theory would predict that 'also' is stressed in (154a), but not in (154b). On first hearing, there does not seem to be a big difference in stress on 'also' between (154a) and (154b), but it is well known that such differences can be very subtle, and valid conclusions can only be drawn when phonetic recordings are taken (see Beaver et al. 2007 for another study on the semantics of focus with this methodology). I leave this to future research.

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<sup>51</sup>In Constant's notation this is written as 'CT+Exh' and 'Exh+CT', respectively.

## 5 Source of $CF_q$

In chapter 4 I have shown that a number of  $CF_q$ -cancellation contexts have a pragmatic property in common: the property of being a multiple cause context. Nothing has yet been said about how this pragmatic property relates to the cancellation of the counterfactual inference  $CF_q$ . In order to see that there is such a relation, we first need to consider theoretical accounts of how  $CF_q$  is generated in subjunctive conditionals. As discussed in the introduction of the dissertation, previous literature has almost exclusively concentrated on  $CF_p$  and detailed accounts are available that explain how it is generated. I am not aware of any work that accounts for  $CF_q$  in equal detail, so a systematic investigation is in order.

A first try might be to look at these accounts for  $CF_p$  and hope that they extend to  $CF_q$ . I will argue in this chapter on the basis of two influential theories for  $CF_p$ , Iatridou's (2000) 'fake past tense' approach and Ippolito's (2006) approach, that this is not feasible. Instead I will argue for an account that generates  $CF_q$  as a result of  $CF_p$  plus the connection between  $p$  and  $q$ . Karttunen (1971) proposes such an account, and I will adopt his idea. A particular property of his idea is that *conditional perfection* plays a crucial role in generating  $CF_q$ .

In the roadmap, we are at step (B):

Data	Determine empirically the class $S$ of contexts that are $CF_q$ -cancellation contexts.
Analysis	<p>(A) The contexts in <math>S</math> are characterized by the pragmatic property that more than one antecedent is salient for the same consequent.</p> <p>⇒ (B) <b>Conditional perfection (the pragmatic strengthening of conditionals into biconditionals) is a necessary ingredient for <math>CF_q</math> to arise.</b></p> <p>(C) Contexts with the pragmatic property in (A) do not have conditional perfection.</p>

### 5.1 Introduction

There are in principle three types of approach available to explain how  $CF_q$  is generated in a subjunctive conditional. First, one can consider a given theoretical account for how  $CF_p$  arises,

and attempt to apply the same account, *mutatis mutandis*, to  $CF_q$ . For example, if  $CF_p$  is linked to the presence of a certain morpheme X, or is explained as the result of some pragmatic inference, one can try to show that the same morpheme X is present in the consequent, or the same pragmatic inference is drawn with respect to the consequent. This type of approach I will call a *type-A approach*. As I review previous accounts of  $CF_p$  in this chapter, I will discuss how well they extend to  $CF_q$ , that is how well they lend themselves to a type-A approach.

A second option is to appeal to the semantic relationship that holds between the antecedent and the consequent that is conveyed by uttering the conditional statement. This type of theory, which I will call a *type-B approach*, adopts some theory for  $CF_p$  and shows that  $CF_p$  augmented with the semantic relationship holding between  $p$  and  $q$ , results in  $CF_q$ .

The logical third option is an explanation of  $CF_q$  that is completely unrelated to that of  $CF_p$ .

(155) type-A approach:  $CF_p$  and  $CF_q$  are explained by the same mechanism.

type-B approach:  $CF_q$  can be explained by the presence of  $CF_p$  plus the relationship between  $p$  and  $q$ .

type-C approach:  $CF_q$  is completely unrelated to  $CF_p$ .

At first sight, a type-A approach might seem to be most attractive, for two reasons. First, there are some obvious similarities between  $CF_p$  and  $CF_q$ : they are both suppositions that some proposition is false in the actual world, and they are both generated in subjunctive conditionals. Second, a parallel theoretical analysis is preferable for general reasons of theoretical elegance. However, as I showed in section 1.2.2, there are also significant empirical differences between  $CF_p$  and  $CF_q$  that have to do with their cancellation properties. We saw that  $CF_q$  be cancelled independently of  $CF_p$  in various contexts, but more importantly, that the restrictions on when cancellation is possible are very different. In particular, as shown in chapter 4, multiple cause contexts are important for  $CF_q$ . As a reminder, here is a brief summary of the differences between cancellation of  $CF_p$  and  $CF_q$ :

- (156) a. cancellation of  $CF_p$ : possible in Anderson-type contexts (see (20) on page 15), and depends on the tense morphology of the conditional, and the surrounding context
- b. cancellation of  $CF_q$ : possible in a variety of contexts (chapter 2), depends (at least) on the context being a multiple cause context

In an analysis that treats  $CF_p$  and  $CF_q$  in a parallel way it will be very difficult, if at all possible, to explain that, for example, multiple causes play a role in one case but not the other. This argument applies to any type-A account, irrespective of the details of the  $CF_p$ -theory it is based on. Nevertheless, I will go through some theories of  $CF_p$ , because they have been very influential. I will first evaluate some major previous accounts of  $CF_p$  and consider their extendability to  $CF_q$ . I will argue, however, that none of these theories extend suitably to explain the counterfactuality of  $q$  (section 5.2). A type-C approach will be put aside for reasons of general parsimony, in the absence of strong evidence that supports a theory of this type.

My main goal in this chapter is to argue against a type-A approach. I will not come back to a type-B approach until later (section 5.3 and chapter 6), when I adopt Karttunen's (1971) idea of linking conditional perfection with  $CF_q$ . Karttunen's proposal is one of the few previous suggestions in the literature of a type-B explanation of  $CF_q$ , but it has not been worked out in detail. This is what I will do in chapter 6.

## 5.2 Theories of $CF_p$ and extension to the consequent

Previous theories of counterfactuality of the antecedent can roughly be divided into three groups:

- accounts that encode counterfactuality directly into the contribution of subjunctive marking of conditionals, without relating that compositionally to the realization of subjunctive mood in English via tense marking (e.g. Stalnaker 1975; Karttunen and Peters 1979; von Stechow 1998);
- accounts that derive counterfactuality compositionally from a special 'modal' interpretation of tense marking in the antecedent of the conditional, so-called 'fake tense theories' (e.g.

Iatridou 2000; Karawani 2014);

- accounts that derive counterfactuality compositionally by assuming a regular interpretation of past tense (‘real tense theories’) (e.g. Ippolito 2003, 2006, 2013b).

I will briefly review the first group, and then in some more detail major representatives of the latter two groups. For each of them I will discuss the problems when trying to extend these theories to account for  $CF_q$ .

### 5.2.1 Non-compositional theories

Some accounts encode the counterfactuality of the antecedent directly as contributions made by the indicative and subjunctive mood, without deriving how they arise in a compositional manner from the way these moods are morphologically realized. I will briefly review some of these theories here (Stalnaker 1975; Karttunen and Peters 1979; von Stechow 1998; Leahy 2011).

The basic setup is a quantificational analysis of conditionals, where the domain of quantification is restricted by  $R$ , as discussed in section 1.1. Furthermore, the Stalnakerian context set  $C$  is the set of worlds that are epistemically accessible to the interlocutors (i.e. the worlds they take to be ‘possible’, cf. Stalnaker 1978). Some theories assume that the role of the subjunctive marking is to override a ‘natural default’ that is associated with semantically void and unmarked indicative conditionals. For example, for Stalnaker (1975: 276) this default assumption is that the  $p$ -worlds in the domain of quantification are all in the context set (i.e.  $p \cap R(w) \subseteq C$ ). The role of subjunctive marking is to signal a violation of this natural constraint, or in Stalnaker’s words, to indicate that the “selection function [that selects the worlds in the domain of quantification,  $JT$ ] is one that may reach outside of the context set” (Stalnaker 1975: 276). This idea may be formally represented as ‘ $\diamond(p \cap R(w) \not\subseteq C)$ ’, as suggested by von Stechow (1998: 5-6) (there are other options available, see there for discussion). Von Stechow (1998), building on Stalnaker’s ideas, has an analysis in the same spirit, but the details are slightly different.



(157)	'natural default'	indicative con- tribution	subjunctive con- tribution
Stalnaker (1975)	$p \cap R(w) \subseteq C$	$\emptyset$	$\diamond(p \cap R(w) \not\subseteq C)$
von Stechow (1998)	$R(w) \subseteq C$	$\emptyset$	$R(w) \not\subseteq C$
Karttunen and Peters (1979)		$p \cap C \neq \emptyset$	$\neg p \cap C \neq \emptyset$
Leahy (2011)		$\diamond_{\text{epis}_s} p$	$\emptyset$

( $R(w)$  = domain of quantification;  $C$  = common ground)

In more recent work, Leahy (2011) makes a proposal for  $CF_p$  that is similar in spirit to the older accounts, but is derived technically in a different way. He derives  $CF_p$  as an *antipresupposition*. The idea of an antipresupposition is that Gricean reasoning with scalar alternatives also applies at the level of the presuppositions of competing utterances (a similar idea appears in Ippolito 2003, which will be reviewed in section 5.2.3 below). In the case of conditionals, the presupposition that Leahy proposes for indicatives entails the presupposition of subjunctives (which he takes to be empty). Hence, if somebody utters the presuppositionally weaker subjunctive, the interlocutors reason that the speaker was not in a position to utter the indicative, and hence that its presupposition ( $\diamond_{\text{epis}_s} p$ ) does not hold. This derives  $CF_p$ .

The main problem with all of these theories when trying to make them apply to the consequent (in order to derive  $CF_q$ ), is that we would have to argue that the subjunctive and indicative marking also make claims about  $q$  (for example that the  $q$  worlds are outside the context set, etc.). The arguments for the existence of the natural defaults and the contributions of mood marking in (157) are based on general restrictions on natural language quantification (since the  $p$  worlds are the restrictor of  $\forall w$ ) and context set management. I see no independent grounds to argue that the same claims hold for the  $q$  worlds.

### 5.2.2 Iatridou (2000): modal interpretation of past tense

Iatridou (2000) assumes that counterfactuality of the antecedent arises from a special interpretation of the tense morphology in the antecedent. Conditionals are known to display ‘fake tense’, meaning that they allow for a future interpretation despite the presence of past tense morphology, as in Iatridou’s future less vivid (FLV) conditionals and Ippolito’ (2003, 2006) mismatched past counterfactuals:

(158) If he took this syrup, he would get better. (Iatridou 2000: 234)

(159) If John had come to Mary’s graduation next Sunday, she would have been happy.  
(Ippolito 2006: 635)

Iatridou proposes that the general contribution of a past tense morpheme is an *exclusion operator* (written ExclF): in ordinary cases it conveys exclusion in the temporal domain, but the general nature of ExclF means that in certain environments it can be interpreted in other domains as well, such as in the domain of *worlds*. When a tense morpheme is not interpreted in the temporal domain, it is also called a *fake* or *modal* interpretation of tense.

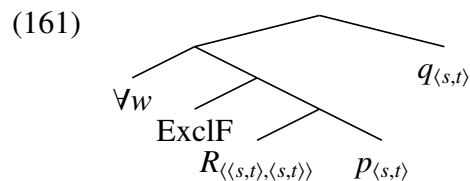
(160) ExclF (Iatridou 2000)  
time version:  $T(t)$  excludes  $C(t)$ ; the topic time excludes the utterance time  
world version:  $T(w)$  excludes  $C(w)$ ; the topic worlds exclude the speaker worlds

The ordinary temporal interpretation of past tense is thus obtained in the following way: ‘John laughed’ means that the times that John laughs exclude the utterance time. In a model with only present and past tense (assuming the future is a modal, not a tense<sup>52</sup>), the ‘exclude’ relation is equivalent to the ‘precede’ relation. Hence ‘John laughed’ means that the time of John’s laughing precedes the utterance time.

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<sup>52</sup>This is, of course, by no means a settled issue. See e.g. Enç (1996), Sarkar (1998), Kissine (2008), and Portner (2009: §5.1) for different perspectives on this question.

The world version of ExclF says that the ‘topic worlds’ (the worlds that are being talked about) exclude the actual world (more precisely, the set of worlds epistemically accessible to the speaker). Crucially, in order for ExclF to be interpreted with respect to worlds, “access to possible worlds” must be given (p. 247), which happens in conditionals because “of course, ExclF takes scope inside the conditional (antecedent) and not outside it” (p. 247n). How taking scope inside the antecedent ensures access to possible worlds is not made technically precise. One may think that it is related to the fact that in the classical Kratzerian theory of conditionals the antecedent acts as the restrictor of a quantifier over possible worlds (see section 1.1). For Iatridou, in the case of counterfactual conditionals the topic worlds are the antecedent worlds in the modal base of the modal operator (e.g. the most similar *p*-worlds, p. 248). The basic structure of a conditional may then look as follows (for simplicity I write *R* for the restriction on the worlds), with ExclF below  $\forall w$ , so that it can combine with the right topic worlds:<sup>53</sup>



As Iatridou does not provide a formal version of ExclF, I will explore two technical implementations of ExclF. One version expresses exclusion at the level of propositions (the *set* of *p*-worlds is distinct from the speaker worlds), the other version expresses it on the level of single worlds.

<sup>53</sup>This is problematic for languages that do not mark counterfactuality in the antecedent, but still have  $CF_p$ . Navajo has been claimed to be such a language (Nevins 2002: 444n), but the original data are hard to obtain. This pattern is also found in Imbabura Quichua (Ecuador), as found in my own work on this language (Barchas-Lichtenstein et al. 2013; Tellings 2014; see also Cole 1982: 65). Here are examples of an indicative and subjunctive conditional:

- (i) Timpu-ta chari-shpa-ka wasi-man ri-sha. [Imbabura Quichua]  
time-ACC have-ADV-TOP house-to go-FUT.1SG  
'I will go home if I have time'
- (ii) Timpu-ta chari-shpa-ka wasi-man-mi ri-n-man ka-rka-ni.  
time-ACC have-ADV-TOP house-to-FOC go-3-COND be-PST-1SG  
'I would have gone home if I had time'

The antecedent of both conditionals are identical in form, but the subjunctive conditional has *-man* marking on the verb in the consequent. The consequent also has an extra layer of tense marking on the verb form *ka-* ‘to be’ (not related to the topic marker suffix *-ka*).

(162) ExclF-world conveys:<sup>54</sup>

a. (propositional exclusion)

$$\lambda p_{\langle s,t \rangle} \lambda w_s. [p(w) = 1 \wedge (\{w' \mid p(w') = 1\} \cap \{w' \mid w' \text{ is epistemically accessible to the speaker}\} = \emptyset)]$$

b. (single world exclusion)

$$\lambda p_{\langle s,t \rangle} \lambda w_s. [p(w) = 1 \wedge w \notin \{w' \mid w' \text{ is epistemically accessible to the speaker}\}]$$

If the propositional version is assumed, we have a situation in which ExclF is under the scope of  $\forall w$  while the part that expresses exclusion (i.e. the second conjunct in (162a)) does not depend on  $w$ , a slight technical redundancy. If the single world version is assumed, because ExclF is under the scope of  $\forall w$ , it still makes a claim about all the relevant  $p$ -worlds.

The two variants of ExclF in (162) yield different results when we evaluate the truth conditions of the tree in (161). For readability, I write  $S$  for the set of worlds epistemically available to the speaker, and  $R$  for the set of worlds in the modal base.

(163)  $P = p$ -worlds,  $Q = q$ -worlds,  $R =$  restriction,  $S =$  speaker worlds

The contribution of ExclF in (161) is:

a. (propositional version / 162a):  $(P \cap R) \subseteq Q$  and  $P \cap R \cap S = \emptyset$

b. (single world version / 162b):  $(P \cap R) - S \subseteq Q$

In (163a), the exclusion claim is separate from the semantics of the conditional, while in (163b) the exclusion becomes part of the domain of quantification. Note that (163a) entails (163b) (if  $P \cap R \cap S = \emptyset$ , then  $P \cap R - S = P \cap R$ ). I take it that (163a) is the right version, and corresponds to what Iatridou had in mind: in addition to the semantics of the conditional, ExclF makes its own contribution, which is cancellable. My (formal) interpretation of Iatridou's proposal is thus that the structure of the conditional is as in (161) with a propositional version of ExclF formalized as in (162a).

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<sup>54</sup>Whether Iatridou meant exclusion to be entailed or presupposed is not entirely clear, see Karawani (2014) for further discussion.

As a concluding remark, besides the issue of formalizing ExclF and the “access to possible worlds”, a problem arises when Iatridou explains how  $CF_p$  is derived as an implicature:

This conversational move [uttering a counterfactual] brings about a certain implicature, namely, that if the speaker chooses to predicate  $p$  of worlds other than the actual one, it is because he or she does not think that the actual world is a  $p$  world.

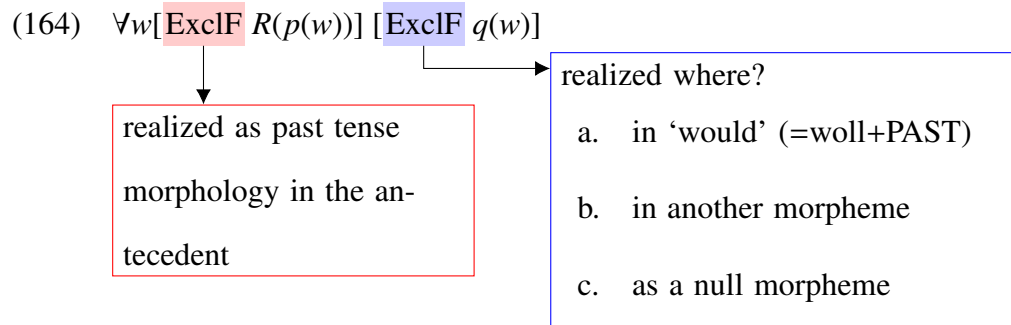
(Iatridou 2000: 248)

It is not quite clear which semantics for counterfactuals Iatridou assumes when she says that a speaker *predicates*  $p$  of certain worlds. In the classical analyses the speaker asserts that the material implication  $p \rightarrow q$  holds in a certain set of worlds. That is a strictly weaker than asserting  $p$  of those same worlds. So, under classical analyses it is more precise to say that ExclF conveys that the *domain of quantification* excludes the actual world. But then a weaker implicature is generated: if a speaker asserts  $p \rightarrow q$  of worlds in a certain domain  $D$ , and conveys that  $D$  excludes the actual world, there is an implicature that the speaker didn't want to assert  $p \rightarrow q$  of the actual world. But that does of course not entail the counterfactual  $\neg p$  holds in the actual world.<sup>55</sup>

**Extension to  $CF_q$ ?** Independent of the above-mentioned concerns regarding the semantics of ExclF and the implicature it gives rise to, there are some problems with extending this proposal to deriving counterfactuality of the consequent, i.e. developing a type-A approach to  $CF_q$  based on Iatridou's (2000) theory of  $CF_p$ . To see this, let us try to derive  $CF_q$  step by step in Iatridou's framework. In Iatridou's terms,  $CF_q$  is the implicature that the set of worlds epistemically accessible to the speaker ('the actual world') is disjoint from the set of  $q$ -worlds. Assuming that ExclF is formalized along the lines suggested above, this implicature can only be derived if there is an ExclF marker present in the consequent of the conditional, since it must semantically compose with  $q$ . The structure would then be as follows, with two instances of ExclF:

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<sup>55</sup>Ippolito (2003: 149) and Mackay (2015) present further problems for Iatridou's theory, that I will not go into here.



The most contentious issue here lies in arguing that there is indeed an ExclF marker present in the consequent, and how it is realized. Before turning to that problem, let me first address two more minor issues.

A first issue relates to Iatridou's terminology of "topic worlds". In using this terminology, she suggests that ExclF says something about the worlds that "we are talking about" (Iatridou 2000: 247). In the formalization in (162a) above, however, ExclF can combine with any proposition  $p$ , which is indeed what happens in (164) (one instance of ExclF combines with the  $p$ -worlds in the modal base, another instance combines with  $q$ -worlds). This makes it incongruent with Iatridou's terminology, because 'topic worlds' suggests some set of worlds that is fixed by discourse. For (164) we would have to say that within one conditional statement, we are (first) talking about the  $p$ -worlds, and (then) about the  $q$ -worlds. It is doubtful if there is an independent reason to assume that the topic worlds shift from the  $p$ -worlds to the  $q$ -worlds within one statement.

The second issue relates to the access to possible worlds that ExclF needs in order to be interpreted with respect to worlds, as discussed above. The second instance of ExclF in (164) is not in the restrictor of  $\forall w$ , but in its nuclear scope. Whether for Iatridou this still counts as a position that grants access to possible worlds is not clear.

The more pressing problem with (164) relates to the presence of ExclF in the consequent of a conditional: there is a clear realization of ExclF as past tense morphology in the *antecedent*, but this is less clear for the consequent. Different authors have taken different views when it comes to the presence of ExclF or similar markers in the consequent of subjunctive conditionals: Asher and McCready (2007) have a counterfactual operator *irr* only in the antecedent of a *would*-conditional,

whereas Karawani (2014) proposes to have a morpheme NAV in both antecedent and consequent.<sup>56</sup> As for Iatridou herself, in the conclusion of her 2000 paper she suggests that in English ExclF must indeed be present in the consequent (p. 268), but she does not provide arguments for this claim, nor explains which diagnostics may independently indicate the presence of this marker. There are three potential places for ExclF in the consequent, as indicated in (164). The most obvious place is in the past tense component of the modal *would*, as it is often analyzed as a combination of the modal core ‘*woll*’ and a past tense (e.g. Abusch 1997). Other options are that ExclF is a null morpheme (i.e. it does not correspond to any overt morphology), or is represented in some other morpheme.

These last two options (i.e. (164b,c)) are implausible, because Iatridou’s idea is that an exclusion marker in *one domain* (e.g. time) can be interpreted with respect to *another domain* (e.g. worlds). Therefore we do not expect morphemes that do not express exclusion in the first place to be able to convey exclusion with respect to worlds. Because other than the past tense inside ‘*would*’ there is no other exclusion morpheme part of the morphology of the consequent of a subjunctive conditional, ‘*would*’ is the only place that could contain ExclF. There is cross-linguistic evidence for this idea about the role of exclusion markers in work by Nevins (2002). We predict that languages that have exclusion markers that are non-temporal, co-opt those markers for counterfactuals as well. In other words, not only fake past tense is used to signal counterfactuality, but also fake spatial exclusion, etc. Nevins (2002) shows that this prediction holds. For example in Burmese, the particle *khé* can express both temporal and spatial exclusion in ordinary contexts, and is also used in counterfactual conditionals.<sup>57</sup> Moreover, Nevins presents data from languages that do not express past tense overtly, such as Mandarin Chinese. Such languages do not allow for cancellation of  $CF_p$  in Anderson-type cases, which Nevins explains by suggesting that conditionals in these languages do not contain the ExclF marker (I discussed this briefly in section 1.2.2, see also my side note on page 114).

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<sup>56</sup>Karawani’s (2014: 88) non-actual veridicality (NAV) morpheme is her version of Iatridou’s ExclF, and introduces the presupposition  $\exists w, t. (\langle w, t \rangle \neq \langle w^0, t^0 \rangle \wedge \varphi(w, t))$ .

<sup>57</sup>See Nevins (2002: 442), and Nichols (2005) for the relevant Burmese data.

Having argued that ‘would’ is the only possible place to contain ExclF, we are still faced with the task to argue on independent grounds that the ExclF marker is indeed present inside the consequent. This is not easy, and to my knowledge there has not been made a convincing case. Recall that for the antecedent there was a simple argument that the past tense morphology is not always interpreted in the usual temporal manner: it can combine with future oriented adverbs.

(165) If John ran the marathon tomorrow, he would win.

This argument does not work for the consequent because we know that *would* can have a future interpretation anyway.

Additionally, given that the verbal morphology in the antecedent and consequent of a subjunctive conditional are typically the same (one layer of past in each for one-past counterfactuals, two layers in each for two-past counterfactuals, see section 1.2.2), the tense morphology in the consequent may be thought of as agreeing with that of the antecedent, as for example [Arregui \(2009\)](#) argues for.

In conclusion, we have seen that when filling in some formal details in Iatridou’s proposal for ExclF, (164) might be a possible way to generate an implicature regarding the exclusion of the *q*-worlds. However, there were a number of technical issues (regarding the notion of ‘topic worlds’, and access to possible worlds). Moreover, it is hard to argue independently that ExclF is present in the consequent of a subjunctive conditional. In addition to all this, as pointed out in the introduction to this chapter, a major drawback of pursuing a directly parallel analysis of  $CF_p$  and  $CF_q$  is that it is very difficult to account for their very different restrictions on cancellation. I conclude that a type-A approach based on [Iatridou’s \(2000\)](#) account for  $CF_p$  is not feasible.

**Side note**

[Nevins’s \(2002\)](#) proposal makes some interesting predictions for the cancellation of  $CF_q$ . [Nevins](#) suggests that cancellability is a feature of the exclusion marker ExclF. Thus, in languages like English that do not have a dedicated marker for counterfactuality, and use the



ExclF marker of past tense instead,  $CF_p$  is cancellable (as shown by Anderson-type conditionals). Languages that have special counterfactual morphology and do *not* use an exclusion marker (i.e. do not co-opt past tense), are thus predicted not to allow cancellation of  $CF_p$ . Nevins shows that this prediction is borne out by showing that Anderson-conditionals are unacceptable in Mandarin Chinese, Tagalog, Turkish, and Slovenian (see Cowper and Hall 2008 for further evidence for Hungarian).

Nevins does not discuss  $CF_q$ , but if his proposal is right, it gives us a way to investigate the relation between  $CF_q$  and ExclF. I would predict that  $CF_q$  is cancellable in Chinese, Tagalog, Turkish, etc. because I argue that  $CF_q$  is not related to an exclusion marker, but to the unrelated phenomenon of conditional perfection. If this prediction can be shown to hold, we have good evidence against a type-A approach based on Iatridou's ExclF proposal.

I have not yet been able to get judgments from speakers of these languages, and leave this investigation to future research.

### 5.2.3 Ippolito's real tense theory

In a series of works, Ippolito (2003, 2006, 2013b) develops a detailed theory of counterfactuality that, in contrast with Iatridou (2000), does not assume a special 'fake' interpretation of the past tense morphology in subjunctive conditionals. According to Ippolito, the reason that past tense in subjunctive conditionals contributes to a counterfactual interpretation, is that the past tense modifies the time argument of the *modal operator* rather than that of the antecedent VP. Ippolito's theory can thus be called a 'real tense' or 'past-as-past' theory (see Ippolito 2013b: §3.6 for some general discussion on this).

Ippolito attempts to account for a wider set of empirical data than much previous work. For example, she accounts for what I referred to as Ippolito's generalization in section 1.2.2: cancellation of  $CF_p$  in Anderson-type contexts is not possible for future oriented two-past subjunctive conditionals (see (23) on page 16). I also mentioned the difference between weak and strong coun-

terfactuality and its relation to the tense morphology inside the conditional (recall the contrast (16)/(17) on page 12). Ippolito proposes the following generalization:

(166) Claim: two-past subjunctive conditionals require strong counterfactuality on  $p$ , whereas one-past conditionals can be strongly or weakly counterfactual on  $p$ .

The data supporting this claim are the following (from Ippolito 2006):<sup>58</sup>

- (167) a. I don't know whether John will play next week, but if he played then, he would certainly win. (one-past, weak  $CF_p$ )
- b. John is dead. If John were alive, he would be a hundred years old. (one-past, strong  $CF_p$ )
- c. #I don't know whether John will play next week, but if he had played then, he would have certainly won. #(two-past, weak  $CF_p$ )
- d. John is dead. If he had played next week, he would have certainly won. (two-past, strong  $CF_p$ )

Ippolito's theory has many technical details, so to avoid going into lengthy theoretical discussions at this point, I will separate my discussion of her work into two parts. Here I focus on the pragmatic parts of Ippolito's theory insofar as they relate to the derivation of  $CF_p$ . The formal semantic part of the theory relating to the interpretation of tense will only become relevant in chapter 7, and I will review that part of the theory in section 7.2.

The basic tenet of Ippolito's theory is that a 'bare conditional' (i.e. the basic tripartite modal structure as in (12) in my section 1.1) is embedded under a number of temporal operators (2006:

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<sup>58</sup>Ippolito is careful in distinguishing between the counterfactuality of the antecedent itself, and the counterfactuality of the *presuppositions* of the antecedent. For example, (i) is infelicitous even though the antecedent is false (John will not run the Boston marathon next spring).

(i) John is dead. #If John ran the Boston marathon next spring, he would win. (Ippolito 2006: 635)

Sentence (i) is infelicitous because the presupposition of the antecedent (that John is alive, see Musan 1997) is not satisfied in the context at the speech time. This differs from the very similar (167b) in that it *asserts* that John is alive, while (i) *presupposes* it (see Arregui 2007: 246n for further discussion). The projection behavior of presupposition of the antecedent is thus a separate phenomenon from the counterfactuality facts in (167) (but both are derived from the temporal semantics in Ippolito's work).

636; 2013b: 59). This means that the semantic structure of a subjunctive conditional takes the form ‘ $\forall t \forall w [\dots]$ ’: at every time interval  $t$  in a certain domain, the bare conditional ( $\forall w [\dots]$ ) holds. The domain of quantification for  $\forall t$  is different for one-past and two-past conditionals, which is the basis for Ippolito’s explanation for their different behavior.

Ippolito derives  $CF_p$  from the idea that natural language universal quantifiers come with a presupposition that their domain is non-empty. Normally, we would expect that the presuppositions of  $\forall w$ , being embedded under  $\forall t$ , project. This would result in the non-emptiness presupposition of  $\forall w$  requiring that there be a relevant  $p$ -world in *every* time interval quantified over. However, Ippolito suggests that the non-emptiness restriction is a weaker type of presupposition (a ‘pragmatic’ presupposition; 2006: 653; 2013b: 48) that does not project universally. Hence, all that is required is (168):

(168) at *some* time interval  $t'$  in the domain, there is *some* (relevant) world  $w'$  at which  $p$  holds

This time interval  $t'$  does not have to be the speech time, showing that subjunctive conditionals *can* have counterfactual antecedents (2006: 654; 2013b: 73). We need something stronger, because subjunctive conditionals typically *do* have counterfactual antecedents. To account for this, Ippolito appeals to a mechanism of Gricean competition at the level of presuppositions (similar to what Leahy (2011) proposes, as discussed in section 5.2.1). Summarizing a lot of technical discussion (see Ippolito 2006: 664-666), the competition between indicative *will*-conditionals and one-past subjunctives takes the following shape:

(169) a. indicative *will*-conditional

↳ presupposes that there is a maximally similar  $p$ -world historically accessible at the speech time (see 2006: 664; 2013b: §3.7)

b. subjunctive one-past conditional

↳ presupposes that there is a relevant  $p$ -world historically accessible at some time in an interval ending at the speech time

These two presuppositions stand in a relationship of asymmetric entailment, so uttering the presuppositionally weaker one-past subjunctive conditional generates the implicature that the presupposition of the indicative does not hold. This shows that one-past subjunctive conditionals have  $CF_p$  as an implicature.

Additional explanation is needed for two-past conditionals, in order to account for the observation that they must be strongly counterfactual (recall the claim (166) and the contrast in (167c/d)). In Ippolito's theory the domain of quantification for  $\forall t$  of two-past conditionals is wholly contained in the past (i.e. it is of the form of an interval  $[t_1, t_2]$  with  $t_2$  preceding the utterance time). In view of (168) we predict that there is a relevant  $p$ -world accessible at some  $t'$  in that domain. The problem is that at  $t'$ , both  $p$  and  $\neg p$  still may be possible (i.e. the possibility of  $p$  is not foreclosed yet), and we do not predict strong counterfactuality.

To solve this problem, Ippolito assumes that the domain of quantification for  $\forall t$  must end at the *transition* time that forecloses the possibility of  $p$  (i.e. the domain of quantification is  $[t_1, t_2]$  with  $t_2$  preceding the time of utterance, and after  $t_2$ , a  $p$ -world is no longer accessible). In the 2006 paper she encodes this into the semantics of past tense:

The fact that a two-past subjunctive conditional is felicitous only in contexts where the counterfactuality of the antecedent is salient, can be construed in the referential theory of tense we have adopted as a presupposition associated with the past tense requiring it to denote a past time immediately before the time when the possibility expressed by the antecedent got foreclosed [...], as shown in [(170)]:

$$\begin{aligned}
 [(170)] \quad \llbracket \text{PAST}_5 \rrbracket^{c,g,t,w} \text{ is defined if } g(5) < t \text{ and } \exists w' [w' \simeq_{g(5)} w \wedge \varphi(w_1)] \wedge \\
 \exists t' [g(5) \ll t' \wedge \neg \exists w'' [w'' \simeq_{t'} w \wedge \varphi(w'')]]. \\
 \text{When defined, } \llbracket \text{PAST}_5 \rrbracket^{c,g,t,w} = g(5).
 \end{aligned}$$

[ $\ll$  denotes 'immediately precedes']

(Ippolito 2006: 651-2; notation adapted)

This says that at time  $g(5)$  (which is the end of the domain interval, which I wrote as  $t_2$  above), a  $\varphi$ -world is accessible (first conjunct), and there is a time  $t'$  immediately after  $g(5)$  at which no  $\varphi$ -world is accessible (second conjunct). A direct technical problem with (170) is that  $\varphi$  is a free variable here, but we may guess that  $\varphi$  was intended to be the argument of a type-lifted version of PAST:  $\lambda\varphi_{(i,t)} : \text{ps } .\varphi(g(5))$  (abbreviating the definedness conditions in (170) by ‘ps’ for readability). Note that this is a very stipulative solution. Clearly, this could not have been intended as a general semantics for past tense, otherwise all past tense sentences would be counterfactual. For example, ‘Mary laughed’, i.e. [PAST<sub>5</sub> Mary laugh], would carry the presupposition that Mary laughed at a time just before it became impossible for her to laugh. But if we are supposed to consider (170) as a special ‘counterfactual past’ without any theory of how and where it is licensed, it does not do much more than formalizing the counterfactuality supposition in a stipulative and non-compositional way.<sup>59</sup>

In summary, Ippolito accounts for the following facts:

- (171) One-past counterfactuals MUST be weakly  $\text{CF}_p$ : Gricean competition with *will*-conditionals
- One-past counterfactuals CAN be strongly  $\text{CF}_p$ : pragmatic presupposition of non-emptiness of  $\forall w$
- Two-past counterfactuals MUST be strongly  $\text{CF}_p$ : special PAST morpheme (in the 2006 version)

**Extension to  $\text{CF}_q$ ?** Ippolito’s explanation of why one-past conditionals can be counterfactual depended on the pragmatic non-emptiness presupposition of  $\forall w$  (see (168)). Since  $q$  is not in the restrictor but in the nuclear scope of  $\forall w$ , the non-emptiness presupposition has nothing to say about the existence of a  $q$ -world in some time intervals. Similar remarks can be made for the

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<sup>59</sup>In the 2013b version of the theory, this special PAST no longer appears. If I understand her 2013b proposal correctly, she still makes use of the ‘transition interval’ that is encoded in (170), but she simply assumes that it is made salient in the context (Ippolito 2013b: 83).

other two results regarding  $CF_p$ s in (171): the Gricean competition operates on the assumption that indicative *will*-conditionals and one-past counterfactuals make requirements on accessibility of  $p$ -worlds (not  $q$ -worlds). And the PAST morpheme from (170) combines with the antecedent, not the consequent. For these reasons I do not see how Ippolito’s theory can be extended to derive  $CF_q$ , i.e. I rule out a type-A approach based on Ippolito’s account of  $CF_p$ .<sup>60</sup>

### 5.3 Karttunen’s schema

I have argued that a type-A approach does not work for some of the major previous accounts of  $CF_p$ . An example of a type-B approach is sketched by Karttunen (1971). He proposes that  $CF_q$  is the result of  $CF_p$  plus *conditional perfection* (CP), the pragmatic strengthening of conditionals to biconditionals (i.e. the strengthening of  $p \rightarrow q$  to  $\neg p \rightarrow \neg q$ ).

When uttering a counterfactual conditional, one infers the counterfactuality of  $p$  ( $CF_p$ , the technical way by which this is generated does not matter for Karttunen’s account). If that conditional is also strengthened into a biconditional (i.e. it undergoes conditional perfection), from the negation of  $p$ , the negation of  $q$  can be derived. This amounts to the counterfactuality of the consequent, or  $CF_q$ . This procedure can be schematically represented in what I will call **Karttunen’s schema** (this is actually a simplified version that will be refined in chapter 6):

(172) *Karttunen’s schema* (first version) (Karttunen 1971)

Utterance:  $p \rightarrow q$

Implicatures:

$\neg p$  (counterfactuality of  $p$ )

$\neg p \rightarrow \neg q$  (conditional perfection on  $p \rightarrow q$ )

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$\neg q$  (by Modus Ponens)

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<sup>60</sup>As a final remark, let me note that Ippolito’s theory does make predictions about the consequent when it comes to its *presupposition projection* behavior. But, as I pointed out in my footnote 58 above (page 116), presupposition projection facts should not be confused with facts about counterfactual inferences. In the dynamic view Ippolito (2006) adopts, a conditional sentence updates the context with both  $p$  and  $q$ . Then it follows, as Ippolito notes, that the presuppositions of  $q$  (that are not entailed by  $p$ ) must be locally accommodated by the modal base operator HIST (see my section 7.2 for more on this), and hence must also be satisfied by the context (see e.g. 2006: 659n).

Note that in this schema conditional perfection is a necessary condition for  $CF_q$  to be generated. This thus gives rise to a central prediction, that curiously was not discussed by Karttunen (1971), nor in later literature.

(173) **Central prediction:** if a conditional does not have conditional perfection, it does not have  $CF_q$

This prediction allows us to explain the cancellation of  $CF_q$  by the lack of conditional perfection, an explanation that I will follow in chapter 6. Of course Karttunen's four-page squib leaves out a lot of detail, and since 1971 there have been many developments in semantic theories of conditionals, accounts of  $CF_p$ , and pragmatic theories of conditional perfection. I have not discussed conditional perfection at all yet, which is what I will do in the next chapter. The reader may wonder why this subsection on Karttunen's account is so short, given the crucial role it plays in this dissertation. The reason for this is that the justification for his account, and the power of his simple idea, will only become clear when conditional perfection and the relation to  $CF_q$  are studied in more detail. In other words, the strongest support for adopting Karttunen's account comes from showing that the interactions between conditional perfection and  $CF_q$  are precisely as predicted by his theory. This is what I aim to do in chapter 6.

## 6 Conditional Perfection and $CF_q$

In previous chapters I have shown that what various  $CF_q$ -cancellation have in common is that they are multiple cause contexts, i.e. contexts in which more than one cause for the same consequent is salient (chapter 4). In that chapter I also explained that there are a number of linguistic cues that may signal such a context. These include the presence of an additive focus particle ‘also’ in the consequent of the conditional, but only when it associates with a contrastive topic in the antecedent (what I called non-local ‘also’; see chapter 3). In that position the focus alternatives are generated in the antecedent, which can be thought of as the additional causes for  $q$ . Drawing parallels from the literature on postposed stressed additive particles, I also showed that that not all multiple cause contexts need to be signaled by an additive focus particle (section 4.6). Hence we found  $CF_q$ -cancellation contexts that are marked by intonation alone. Finally, in chapter 5, I showed that there is a connection between  $CF_q$  and conditional perfection as illustrated in what I referred to as **Karttunen’s schema**:

(174) *Karttunen’s schema* (first version) (Karttunen 1971)

Utterance:  $p \rightarrow q$

Implicatures:

$\neg p$  (counterfactuality of  $p$ )

$\neg p \rightarrow \neg q$  (conditional perfection on  $p \rightarrow q$ )

---

$\neg q$  (by Modus Ponens)

The key prediction of this schema is that contexts that block conditional perfection for some reason also block the generation of  $CF_q$ . In this chapter I will study conditional perfection in detail, and we will see that Karttunen’s schema requires some modification, as it does not generalize well to subjunctive conditionals, the case we are interested in. The main goal of the chapter is to show that conditionals in multiple cause contexts do not have conditional perfection. This provides the bridge between the characterization of  $CF_q$ -cancellation contexts as multiple cause contexts in the



previous chapters, and how the inference of  $CF_q$  is generated. It forms the last step of my analysis: in terms of the roadmap, we are now at step (C).

Data	Determine empirically the class $S$ of contexts that are $CF_q$ -cancellation contexts.
Analysis	<p>(A) The contexts in <math>S</math> are characterized by the pragmatic property that more than one antecedent is salient for the same consequent.</p> <p>(B) Conditional perfection (the pragmatic strengthening of conditionals into biconditionals) is a necessary ingredient for <math>CF_q</math> to arise.</p> <p>⇒ (C) <b>Contexts with the pragmatic property in (A) do not have conditional perfection.</b></p>

## 6.1 Introduction

**Conditional perfection**<sup>61</sup> refers to the tendency to pragmatically strengthen conditional statements to biconditional statements. Although conditional perfection is a logical fallacy (a conditional does not logically entail a biconditional), it is a linguistic inference that interlocutors readily make. This is often illustrated by the now classic example in (175) from Geis and Zwicky (1971).

(175) If you mow the lawn, I will give you \$5. (Geis and Zwicky 1971: 562)  
 implicature: if you don't mow the lawn, I will not give you \$5

This is the traditional example that starts almost every discussion of conditional perfection, although in this specific case it may be objected (Gabriel Greenberg, p.c.) that the implicature can equally well be explained by appealing to world-knowledge that people do not tend to give out \$5 freely.<sup>62</sup> In (176) there is another example of conditional perfection, one that is less susceptible to this objection.

<sup>61</sup>Conditional perfection is sometimes also referred to as 'conditional strengthening'. I will avoid this terminology because 'strengthening' in the context of conditionals is also used in reference to the projection of presuppositions in the consequent, as discussed in section 3.3.1.

<sup>62</sup>Note that Geis and Zwicky (1971: 562) write that "our attitudes toward the exchange of money in our society" warrant the perfection inference in (175). On a related point, Carston (1995: 222) points out that conditional perfection can happen in contexts that "run counter to what is stereotypical or obvious in human transactions" (p. 223):

- (i) If you don't pick up the garbage I'll make you a cake.  
 → If you do pick up the garbage I won't make you a cake.

(176) One can take this seat if one is disabled or one is older than 70. (de Cornulier 1983)

implicature: one cannot take this seat if one is not disabled and younger than 70

Note that in both (175) and (176) the perfection of  $p \rightarrow q$  is given as an inference that  $\neg p \rightarrow \neg q$ . Together these two statements indeed amount to a biconditional  $p \leftrightarrow q$ , but *identifying* conditional perfection with this inference that  $\neg p \rightarrow \neg q$ , as is often seen in the literature, does not generalize well to subjunctive cases (more about this in section 6.2).<sup>63</sup> Conditional perfection in subjunctive conditionals is much less studied than for indicative conditionals, yet it is the subjunctive case that we are most interested in, since Karttunen's schema says that  $CF_q$  is generated when a subjunctive conditional (that has  $CF_p$ ) gets perfected. An example of conditional perfection with subjunctives is given in (177) (from Karttunen 1971), where I informally write the perfection inference as 'if and only if'. In section 6.2 I will spell out in more formal detail what this means.

(177) If Harry had known that Sheila survived, he would have gone home.

implicature: if and only if Harry had known that Sheila survived, he would have gone home

A descriptive definition of conditional perfection that generalizes to indicatives as well as subjunctives, is the interpretation of a conditional as a biconditional, or the strengthening of a sufficient condition to a necessary condition (cf. Horn 2000).

**Restrictions on conditional perfection** In many places in the literature it has been pointed out that conditional perfection does not apply to all conditionals in all contexts. Studying cases in which conditional perfection fails is our main goal, because by Karttunen's schema, a failure of conditional perfection results in the  $CF_q$  inference not being generated.

In very general terms, conditional perfection has been claimed to mostly occur in cases in which the speaker has control over the consequent (in threats and promises), has complete knowledge over

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<sup>63</sup>Two possible representations of conditional perfection on  $p \rightarrow q$  are ' $(p \rightarrow q) \Rightarrow (\neg p \rightarrow \neg q)$ ' and ' $(p \rightarrow q) \Rightarrow (\text{only if } p, q)$ '. Van Canegem-Ardijns and van Belle (2008) argue that these two inferences in fact constitute two different types of conditional perfection that are attested in different empirical contexts. Since they are mostly concerned with what conditional perfection means for different speech act types, and do not suggest that formal pragmatic theories of conditional perfection (to be discussed in section 6.3.2 below) should derive these as different types of inferences, I will not adopt this view of conditional perfection here.

the consequent (in warnings), or has a positive or desirable orientation toward the hearer or speaker (in recommendations) (see e.g. van Canegem-Ardijns and van Belle 2008; Nadathur 2015). As for cases in which *no* conditional perfection occurs, more specific descriptive claims have been made in the form of lists of contexts and circumstances in which conditionals do not get perfected, so-called **unperfectable** conditionals (see e.g. Horn 2000; van Canegem-Ardijns and van Belle 2008).

Some unperfectable conditionals fall into groups that are easily recognizable by virtue of their form or what they express. For example, *concessive* conditionals are unperfectable. Concessive conditionals, also known as *semifactuals* or *even-if* conditionals, start with ‘even if’ (and often contain the word ‘still’ in the consequent).<sup>64</sup> In terms of meaning, they are characterized by the lack of a causal relation between antecedent and conditional: in (178) John’s going home has no influence on my going home or not (more about concessive conditionals in section 7.3.1).

(178) *Even-if conditionals*

Even if John goes home, I (still) won’t come.

↗ (even) if John doesn’t go home, I will come

Another class of unperfectable conditionals are so-called ‘biscuit conditionals’ (recall section 1.1), conditionals in which the antecedent *p* is not a condition for the consequent *q* in the usual sense, but rather gives a condition for the felicity of making the speech act in *q* (see van Canegem-Ardijns and van Belle 2008: 365-7 for some related speech acts).

(179) *Biscuit conditionals*

If you’re hungry, there are biscuits in the cupboard.

↗ If you’re not hungry, there are no biscuits in the cupboard

Then there are specific examples of conditionals that do not trigger a conditional perfection inference, but that at first sight do not appear to fall into a natural class. Here are two such examples

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<sup>64</sup>Note that although *even-if* conditionals often contain the word ‘still’ in their consequent, they are distinct from the group of CF<sub>q</sub>-cancellation contexts with ‘still’ as identified in chapter 2, and discussed further in chapter 7. The specific point that these two types of conditionals differ is made in section 7.3.1.

from von Fintel (2001) (originally from Lilje 1972):

- (180) a. If this cactus grows native to Idaho, then it is not an *Astrophytum*.  
↗ If this cactus doesn't grow native to Idaho, it is an *Astrophytum*.
- b. If you scratched on the eight-ball, then you lost the game.  
↗ If you didn't scratch on the eight-ball, then you didn't lose the game.

It is not immediately clear what sets these conditionals apart from cases like (175) and (176) in which conditional perfection does arise. In section 6.3.2 we will be able to characterize the data in (180) formally, in terms of the discourse structure in which these conditionals are embedded. For the time being, I will loosely refer to cases as in (180) as 'discourse unperfectables'. This is not a very apt term, because what is, say, a biscuit conditional is also determined by the surrounding discourse. However, used as an informal notion for expository purposes, it will be helpful in the upcoming discussion.

**Multiple cause contexts** The main claim I will be making in this chapter is that conditionals in multiple cause contexts are unperfectable. In addition to the concessive conditionals, biscuit conditionals and discourse unperfectables, this makes four classes of unperfectable conditionals. All of these are important for our purposes, because Karttunen's schema predicts that for each of them, their subjunctive variants do not trigger  $CF_q$  (recall (173)). In the last part of this chapter I will verify that each of these predictions is borne out. The situation is summarized in Figure 4.

**Outline of the chapter** The structure of this chapter is as follows. I will first elaborate on what conditional perfection means for subjunctive conditionals, and obtain a more precise version of Karttunen's schema that applies to subjunctives (section 6.2). Then I move on to the main part of this chapter, showing that multiple cause contexts block conditional perfection, claim 4 in Figure 4. Although allusions to this claim have been made before, the claim has not been defended in full generality. I will adduce various pieces of evidence, from references in earlier literature and from

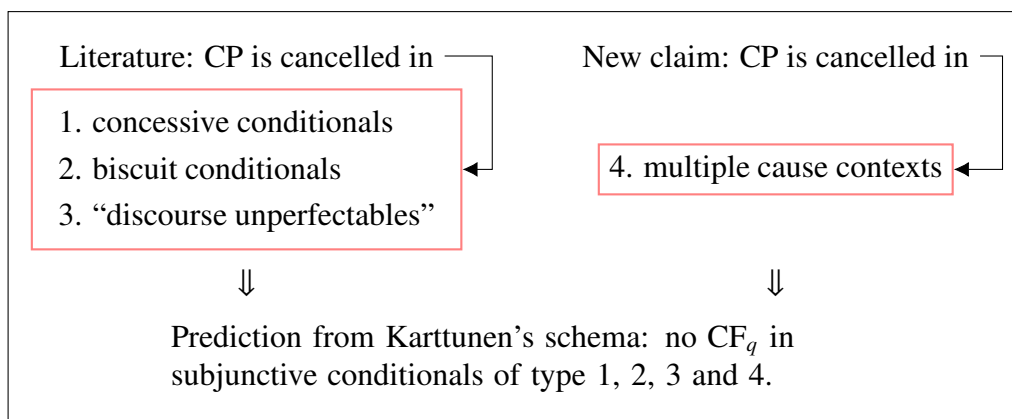


Figure 4. Predictions about conditional perfection (CP) and  $CF_q$

experimental research, and go through a number of theoretical accounts of conditional perfection and show how they derive this result (section 6.3).

I will postpone talking about the predictions regarding  $CF_q$  (i.e. those made by Karttunen's schema, the bottom lines in Figure 4) until section 6.4. In doing so, I make the structure of this chapter reflect the important conceptual distinction between conditional perfection and counterfactuality. The claim that conditionals in multiple cause contexts are unperfectable is a *claim about conditional perfection*, and is independent from counterfactuals and  $CF_q$ . Only after combining the result with Karttunen's schema, it has consequences for  $CF_q$ , and they will be discussed in section 6.4.

## 6.2 Conditional perfection and subjunctives

Karttunen's schema says that a perfected subjunctive conditional, together with  $CF_p$ , results in  $CF_q$ . It is thus crucial that we have a precise notion of what it means for subjunctive conditionals to be perfected. Importantly, however, in Karttunen's (1971) original implementation, there is strictly speaking no conditional perfection of subjunctives. That is because Karttunen assumes that the assertive contribution of a counterfactual conditional is the corresponding indicative conditional 'if  $p$ , then  $q$ ', as shown in (181) with Karttunen's original example.

(181) a. Karttunen’s example sentence:

If Harry had known that Sheila survived, he would have gone home.

b. assertive content, according to Karttunen:

If Harry knew that Sheila survived, he went home.

It is the assertive content in (181b) that conditional perfection applies to, and hence the original version of Karttunen’s schema is the version with negation (see (174)). Clearly, (181b) is at odds with current views on the semantics of counterfactual conditionals, that assign different assertive contents to indicatives and subjunctives. Karttunen does not explain the reason for taking (181b) to be the assertive content of (181a), but one may speculate that it is related to a general problem that arises when checking whether counterfactual conditionals satisfy certain logical inferences. I will discuss this problem in more detail below, but informally the problem can be thought of as follows: by definition, counterfactuals have inferences about the truth and falsity of their antecedent and consequent ( $CF_p$  and  $CF_q$ ). These inferences interfere with drawing conclusions from logical inferences, which start with premises of truth and falsity. I suspect that this is what Horn (2000) had in mind when he writes that “conditional perfection has standardly been seen as applying to indicative conditionals only, not to subjunctives or counterfactuals” (p. 320). Horn goes on to dispel this claim, and I will review his take on this issue below.<sup>65</sup>

**Logical inferences with subjunctives** I will first illustrate the problem with the somewhat easier case of Modus Ponens, and then move on to conditional perfection. For indicatives the premises of Modus Ponens ( $p$ , and a conditional with antecedent  $p$ ) can be uttered in the same context (e.g. ‘it rains’ and ‘if it rains, John brings his umbrella’). In the counterfactual case, however, there is a pragmatic problem: because of  $CF_p$ , in any context in which  $p \square \rightarrow q$  may be uttered, one cannot felicitously utter  $p$ .

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<sup>65</sup>This claim from Horn (2000) is quite remarkable, as he does not provide references to literature in which this “standard” view is defended. In fact, in the classic paper on conditional perfection, Geis and Zwicky (1971), counterfactual conditionals are explicitly mentioned as susceptible to conditional perfection. I have not been able to find any mentions of this allegedly standard view in articles that aim to summarize the conditional perfection literature (van der Auwera 1997a,b) or focus on contextual restrictions of conditional perfection (van Canegem-Ardijns and van Belle 2008).

- (182) P1 It is raining  
 P2 #If it were raining, John would bring his umbrella  


---

 C ?John brings his umbrella

In other words, the sets of contexts that admit  $p$  and  $p \Box \rightarrow q$  are disjoint. This pragmatic problem, however, is separate from the validity of the logical inference of Modus Ponens: it is still true that given P2, in any situation  $s$  in which it is raining, it follows that John brings his umbrella in  $s$  (Williamson 2005: 18n makes a similar point). The pragmatic problem is just that  $s$  is not the actual world.

The same problem arises for counterfactuals and conditional perfection. If one assumes that that conditional perfection of  $p \rightarrow q$  is the inference  $\neg p \rightarrow \neg q$  (as is often done on the basis of indicative examples), a problem arises for subjunctives: one cannot utter  $p \Box \rightarrow q$  and  $\neg p \Box \rightarrow \neg q$  in the same context. This is again because of  $CF_p$ : the counterfactuality of the antecedent in the two subjunctives requires that  $\neg p$  and  $p$  are true in the actual world, respectively. To give an explicit example, consider (183).

- (183) a. If you had mowed the lawn, I would have given you \$5.  
 b. If you hadn't mowed the lawn, I wouldn't have given you \$5.

In (183a),  $CF_p$  requires a context where I did *not* mow the lawn, while (183b) requires a context where I *did* mow the lawn. Since these are mutually exclusive, it is pragmatically problematic to say that (183b) is implicated when uttering (183a).<sup>66</sup> Like the Modus Ponens case above, the pragmatic restrictions on uttering (183a) and (183b) do not mean that no conditional perfection

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<sup>66</sup>Jessica Rett (p.c.) points out that (183a) is ambiguous between a counterfactual and a past habit reading. The past habit reading is typically reported as most salient for one-past counterfactuals, as in the following case (see e.g. Karawani 2014: 117-8 for discussion of this):

- (i) (When I was young...) If I mowed the lawn, my grandmother would give me \$5.

Although it looks like a subjunctive conditional, this reading describes a past habit (in the past, whenever I mowed the lawn, my grandmother gave me \$5). In that case there is no problem, as it is an indicative conditional with past perfect 'real' tense, and both  $p \rightarrow q$  and  $\neg p \rightarrow \neg q$  are felicitous.

takes place with counterfactuals. Returning to Horn’s (2000) remarks, he suggests that perfection does occur in (183a), in the sense that a sufficient condition is being strengthened to a necessary condition:

what I *say* is that in the closest world to the actual one in which you mowed the lawn, I gave you \$5; what I *implicate* is that in that world I gave you the money (not just *if* but also) *only if* you mowed the lawn. (Horn 2000: 321, emphasis in original)

This then gives a correct formal notion of conditional perfection in subjunctives. Horn here assumes a certain semantics for counterfactual conditionals using a closeness (similarity) ordering on worlds (see section 7.2 for more on this), but the point Horn is making does not hinge on a specific formalism. More generally, his idea is that conditional perfection takes place under the scope of the universal quantifier. Conditional perfection in counterfactuals can be represented without reference to a specific semantic theory. Using the template of a universal force semantics of conditionals (recall section 1.1) where  $R$  stands for the theory-specific quantificational restriction (accessible worlds, most similar worlds, etc.), conditional perfection may be represented as follows:<sup>67</sup>

(184)  $\forall w'.((R(w, w') \& p(w')) \rightarrow q(w'))$  is strengthened to  $\forall w'.(R(w, w') \rightarrow (p(w') \leftrightarrow q(w')))$

We are now in a position to reformulate Karttunen’s schema so that it applies to subjunctives:

(185) *Karttunen’s schema* (revised version)

Utterance:  $p \Box \rightarrow q$  in world of evaluation  $w$  (i.e.  $\forall w'[R(w', w) \rightarrow (p(w') \rightarrow q(w'))]$ )

Implicatures:

$\neg p(w)$  (counterfactuality of  $p$ )

$R(w, w)$  (centering on  $R$ )

$\forall w'[R(w, w') \rightarrow (p(w') \leftrightarrow q(w'))]$  (CP for subjunctives, the ‘Horn interpretation’)

---

$\neg q(w)$  (counterfactuality of  $q$ )

---

<sup>67</sup>Here I assume a strict analysis of counterfactuals, see footnote 9 on page 10.



Horn gives two additional examples:

- (186) a. If I had watered that plant, it would have survived. (Horn 2000: 321)  
b. If Leonardo diCaprio had watered that plant, it would have survived.

He claims that conditional perfection occurs in (186a) but not in (186b): in (186a), in all closest worlds in which the plant survived, it's because I watered it. However, in (186b), says Horn, "in the nearest world in which the plant survived, young Leo wasn't the one who watered it, I was" (p. 321).

What Horn does not discuss is the role focus plays here (but see his fn. 18 on p. 308-9).<sup>68</sup>

- (187) a. If [Leonardo diCaprio]<sub>F</sub> had watered that plant, it would have survived.  
b. If Leonardo diCaprio had [watered]<sub>F</sub> that plant, it would have survived.

When focus is on 'Leonardo diCaprio', the speaker suggests that somebody else's watering of the plant (including the speaker's) would *not* have rescued the plant. So it makes false Horn's assumption about the meaning of (186b): "an adventitious visit by the teen idol [in 2000, diCaprio was still a teen idol, JT], sprayer in hand, would have rescued my coleus as surely as my watering it would have done" (p. 321). Then (187a) has conditional perfection by precisely the same reasoning that Horn provided for (186a), as mentioned above.

When focus is on 'watered', we are in a situation in which Leonardo diCaprio must be salient ('given' in the focus literature), i.e. we must have been talking about him in the preceding context. But in such a context there presumably is an event of diCaprio's watering the plant in the closest worlds, so it is no longer clear why Horn's explanation of why (186b) would not have perfection as cited above holds.

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<sup>68</sup>Recall also my footnote 16 about Dretske-counterfactuals (page 33).

## 6.3 Conditional perfection and multiple cause contexts

In this section I will argue that conditional perfection is blocked in multiple cause contexts. First, I will adduce some supporting evidence from experimental work and mention some relevant references in the literature. Then, in section 6.3.2 I will review the main pragmatic accounts for conditional perfection, and show how the result is obtained in those theories.

### 6.3.1 Experimental evidence and earlier literature

The claim that conditional perfection does not occur on conditionals uttered in multiple cause contexts, makes sense at an intuitive level: if both  $p_1 \rightarrow q$  and  $p_2 \rightarrow q$  are given, one is less likely to make the inference that  $p_1$  is a necessary condition for  $q$ . This intuition finds corroboration in experimental psycholinguistic work. For example, it has been shown that the salience of additional antecedents for the same consequent makes subjects less prone to making the fallacy of denying the antecedent (DA; if  $p$ ,  $q$ ; not- $p$ ; therefore not- $q$ ). Rumain et al. (1983) conducted an experiment in which adults were given either a single premiss (188a) or multiple premisses (188b), and were then asked a question on the validity of a DA argument.

- (188) a. If there is a duck in the box, there is a peach in the box. There is not a duck; is there a peach?
- b. If there is a dog in the box, there is an orange in the box; if there is a tiger in the box, there is an orange in the box; there is not a dog; is there an orange?

Of the participants 73% responded ‘no’ (rather than ‘can’t tell’) to a DA argument when given a single premiss, whereas only 25% answered ‘no’ (and 69% ‘can’t tell’) when given multiple premisses. These results have been replicated in later studies, see Politzer (2003) for discussion.

Although the conditional perfection literature has not addressed multiple cause contexts directly, at various places claims have been made in passing to the effect that multiple cause contexts block conditional perfection. That the lawn mowing example (175) is everybody’s favorite example can be seen from the number of remarks that have been made in relation to that specific

example:

- [Lilje \(1972: 540\)](#) says that conditional perfection does not arise in (175) in contexts in which there may be “some other way he could earn five dollars, by cleaning up the garage or whatever”;
- [van der Auwera \(1997a\)](#) suggests conditional perfection arises because of the negation of conjunctive statements like “If you mow the lawn, I will give you five dollars and if you wash my car I will give you five dollars” are taken to be false (we will see more of his proposal in section 6.3.2);
- [van Canegem-Ardijns and van Belle \(2008: 372\)](#) point out that cancellation of conditional perfection happens “by the addition of an alternative way” to earn 5 dollars, such as “paint the garage”;
- [van Tiel and Schaeken \(2015: 12\)](#) say that conditional perfection does not occur when “the speaker might also give five dollars if the hearer cleans up the garage or does the dishes”.

[Von Fintel \(2001\)](#) is skeptical about the claim that conditional perfection is as general a phenomenon as is usually claimed, and takes a weaker implicature to be empirically correct. For example for (175) he disagrees that it is strengthened into ‘if you don’t mow the lawn, you won’t get \$5’. Instead, he suggests that the weaker ‘you don’t get \$5 no matter what’ (i.e., the \$5 is not unconditional) is triggered (recall the unconditional scale from (192) above). Interestingly, his support for the claim that this weaker inference is triggered is based on the idea of multiple causes (although he does not use that label). He gives the above quote from [Lilje \(1972\)](#) as support for his position, which I give here in a longer version:

A person to whom [(175)] is addressed could well ask whether there might not be some other way he could earn five dollars, by cleaning up the garage or whatever. That is, if he does want the five dollars, and does not want to mow the lawn, he need not simply conclude that he’s out of luck. Nor need the person who utters [(175)] intend to suggest that. [(175)] could well be

the first item on a list of responses to the question, ‘How can I earn five dollars?’.

(von Fintel 2001: 4 / Lilje 1972: 540)

The reasons for von Fintel’s skepticism are thus based on the potential presence of additional causes, in line with my claim that multiple cause contexts block conditional perfection. If, per the quote above, the answer is “the first item on a list of responses”, this would be marked as such intonationally (I will discuss listing intonation in section 6.4).

Focusing on other examples, [van Canegem-Ardijns \(2010: 7\)](#) states that conditional perfection “may be cancelled by a clause that supplies a complementary condition ‘but also if B, then C’ ”, as in (189a). Likewise, [Herburger \(2015a\)](#) gives (189b) as an example in which conditional perfection gets cancelled.

(189) a. If you wash the dishes I’ll help you with your homework. But not only if you wash the dishes, also if you clean the table. ([van Canegem-Ardijns 2010: 7](#))

b. If you work hard you’ll succeed. And if you’re lucky you’ll succeed as well.

([Herburger 2015a](#))

Both cases in (189) are specific examples that use an additive particle (‘also’, ‘as well’) to signal a second antecedent for the same consequent, just like in the counterfactual cases we have been considering before.

Finally, in writing about (176), [de Cornulier \(1983\)](#) remarks:

the utterance situation suggests that if **other sufficient conditions** (allowing one to sit here) did exist, they would have been mentioned, so that the only mentioned property (to be disabled or to be older than 70) is the only property which gives one the right to sit here (presumption of exhaustivity) ([de Cornulier 1983: 248](#), emphasis mine)

[De Cornulier](#) thus talks of a context that lacks “other sufficient conditions”, i.e. a context that is not multiple cause.

Overall, we can conclude that the relevance of the presence or absence of multiple causes to the phenomenon of conditional perfection has been widely recognized in the literature, and

is supported by experimental evidence. However, it is my assessment of the literature, that it is (a) often taken as a negative fact (as an argument showing that conditional perfection is not as widespread as sometimes believed, see my point about [von Fintel 2001](#) above), (b) discussed in relation to a specific example (like (175)) and not recognized as a general restriction on conditional perfection, and/or (c) not discussed in relation to formal accounts of conditional perfection. This last thing is required in order to obtain the result rigorously: we want to show how existing theories that describe and explain conditional perfection can account for this result. I will now turn to that.

### 6.3.2 Theories of conditional perfection

A theory of conditional perfection will have to answer two questions (very similar to the two questions about counterfactuality in (26) on page 18):

- (190) a. What is the mechanism that generates the implicature that strengthens a sufficient into a necessary condition?
- b. What explains the empirical distribution of conditional perfection, i.e. why does the mechanism in a. only work in the cases summarized in the section [6.1](#)?

Approaches to the first question can roughly be divided into those that derive conditional perfection as a scalar Q-implicature and those that derive it as a different sort of implicature such as a Relevance implicature. With two different views on Q-implicature, this gives three types of theory:

1. Theories that derive conditional perfection as a **Q-implicature** in a classical Gricean framework. Various different sets of scalar alternatives have been proposed as the basis of this implicature (e.g. [von Fintel 2001](#), and a lot of older work summarized in [van der Auwera 1997a](#));
2. Theories that explain conditional perfection as a **Relevance implicature** or as an application of Levinson's I-heuristic ([Carston 1995](#); [Horn 2000](#); [Levinson 2000](#));



Van der Auwera's type of account has been criticized on two points: the infinite length of the scale in (191) (e.g. von Stechow 2001), and that it violates the assumption that the items on a Horn scale should all be equally lexicalized (e.g. Horn 2000; Levinson 2000: 120). I mention van der Auwera's proposal here because it is worth noting that this theory incorporates the idea that multiple cause contexts block conditional perfection: the higher items on the scale are conjunctions of conditionals with the same consequent  $q$ .

Also, there have been proposals of an 'unconditional' scale, which exists in several variants (see van der Auwera 1997a: exs. (7)–(9)):

(192)         $q$  no matter what  
              ↑ if  $p, q$

This has been criticized as generating too weak an implicature, as it only implicates that  $q$  is not taken to be true no matter what (Nadathur 2015).

As far as I know no detailed explanation of contextual restrictions on conditional perfection has been offered within a classical Q-implicature account. The task that classical Q-theories of conditional perfection face is to explain why conditional perfection, as a classical scalar implicature, arises in some contexts but not in others. Although there is some recent work that studies the relation between scalar implicatures and discourse structure (e.g. constraints on cancellation with respect to the QUD; Mayol and Castroviejo 2013), providing an answer to (190b) is more difficult. It would presumably involve some kind of story that explains why the scalar alternatives in e.g. (191) are not available in the contexts listed in section 6.1. Given that there is no consensus on what these alternatives should be in the first place (i.e. whether we should use a scale as in (191), or (192), or something else), I shall not attempt to come up with such a story here.

**2. I/R-implicature** Instead of considering other scales to derive conditional perfection as a Q-implicature (see van der Auwera 1997a for an overview of other Q-implicature accounts), some have concluded directly from the failure of the ⟨if and only if, if⟩ scale that a Q-implicature account

is implausible (Horn 2000; Levinson 2000). Instead, it is argued, since the conditional perfection implicature is stronger than the utterance itself, it should be analyzed as an R-implicature (R-principle: ‘Say as little as possible, given Q’; Horn 2004) or an I-implicature (I-principle: ‘Say as little as necessary to achieve your communicational goals’; Levinson 2000).

Horn (2000) proposes that conditional perfection is a Relevance implicature: “Quantity and Relation/Manner conspire to establish the tendency to perfect conditionals” (p. 310). According to Horn, when a speaker says ‘if  $p$ ,  $q$ ’ instead of just ‘ $q$ ’, the Maxim of Quantity requires that ‘if  $p$ ’ be relevant. Horn furthermore assumes that what makes a condition relevant, is its necessity. Thus, what is uttered as (just) a sufficient condition for  $q$  is interpreted by pragmatic strengthening as also a necessary condition for  $q$ .

Horn’s proposal has been criticized for being less lexicalized and more context-dependent than normal R-implicatures (Herburger 2015a). Moreover, to see how it follows from Horn’s account that multiple cause contexts block conditional perfection, would require more details about the technical implementation than Horn provides. In particular we need to know how R-implicatures are computed dynamically as discourse progresses. To illustrate, let me try to sketch how a R-implicature account might handle a simple discourse with two causes for  $q$ . Assume that we have a multiple cause context in which  $p_1 \rightarrow q$  is uttered first, and  $p_2 \rightarrow q$  is uttered later. According to the R-implicature account, as discussed, after hearing  $p_1 \rightarrow q$ , ‘if  $p_1$ ’ is taken to be relevant and it is inferred that  $p_1$  is a sufficient and necessary condition for  $q$ . At the point in the discourse when  $p_2 \rightarrow q$  is uttered, we cannot make the similar inference that  $p_2$  is sufficient and necessary for  $q$ , as it contradicts the earlier inference about  $p_1$ . Hence, this earlier inference about  $p_1$ ’s necessity must be rejected, and instead the listener must now reason that ‘if  $p_1$ ’ and ‘if  $p_2$ ’ are *both* relevant. If Horn is right about the relevance of necessity, the implicature here would be that  $p_1$  and  $p_2$  are what are called ‘independently necessary’ conditions,<sup>69</sup> in the sense that ‘only if  $p_1$  or  $p_2$ ,  $q$ ’ holds. Since  $p_1$  alone is not necessary, no conditional perfection will take place.

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<sup>69</sup>See e.g. Goertz and Starr (2003).



(193)	Discourse	Pragmatic reasoning
	$p_1 \rightarrow q$	$\Rightarrow$ ‘if $p_1$ ’ is relevant inference $I_1 = ‘p_1$ is a necessary and sufficient condition for $q’$
	$\vdots$	$\vdots$
	$p_2 \rightarrow q$	cancel $I_1$ , $\Rightarrow$ ‘if $p_1$ ’ and ‘if $p_2$ ’ are both relevant inference $I_2 = ‘p_1, p_2$ are independently necessary and sufficient’

Although this may be a plausible story, a lot of details need to be filled in on how the cancellation and updating of inferences works, which I will not attempt here.

**3. Grammatical Q-implicature** Herburger (2015a) provides an account in which conditional perfection is seen as a type of *exhaustification*. Before reviewing Herburger’s account, I will mention two earlier proposals that linked conditional perfection to exhaustification. The idea goes back to Groenendijk and Stokhof’s (1984) work on exhaustive answers. Without cues to the opposite, answers to questions are taken to be exhaustive. So if someone asks who you had dinner with, and you answer ‘John and Mary’, the answer is interpreted exhaustively, that is as meaning ‘only John and Mary’. This is explained by assuming the presence of a silent operator ‘only’ in the answer. Groenendijk and Stokhof suggest that their account of exhaustive answers can also explain (certain cases of) conditional perfection. For example, a conditional ‘John walks if Mary walks’ receives a biconditional interpretation in the following interrogative discourse:

- (194) Q: Does John walk? (Groenendijk and Stokhof 1984: 324)  
A: (John walks) if Mary walks.

When the answer in (194) is taken to be exhaustive, it means ‘only if Mary walks’, which gives the biconditional meaning.<sup>70</sup>

<sup>70</sup>A more recent implementation of Groenendijk and Stokhof’s idea is given in Schulz and van Rooij (2006: 219-20), who derive the same result in a framework of exhaustification as predicate circumscription.

Links between exhaustification and conditional perfection can also be found in von Fintel (2001). Recall that von Fintel appealed to multiple causes to claim that conditional perfection does not occur across the board (page 133). He agrees, however, that conditional perfection (‘true perfection’ in his words) occurs in some contexts, namely he claims that it “will be triggered if the conditional is asserted as an answer to a question eliciting an exhaustive list of sufficient conditions for the consequent” (p. 17). This is thus another proposal that links conditional perfection to exhaustive answers to questions.

Returning now to Herburger (2015a), it is important to observe that her account of conditional perfection is not only based on exhaustification, but can also be seen as a type of Q-implicature account. This is because in recent work, scalar Q-implicatures have been taken to be the result of a very similar type of exhaustification as proposed by Groenendijk and Stokhof. Chierchia et al. (2011) propose a *grammatical* account of scalar implicature, which says that they arise by means of an implicit syntactic exhaustivity operator, written  $O_{ALT}$  or *Exh*. It works on propositions and may be defined as follows (Chierchia et al. 2011: 8n):

(195) Given a sentence  $S$  and a contextually restricted set of alternatives ALT,

$$\llbracket O_{ALT}(S) \rrbracket(w) = 1 \text{ iff } \llbracket S \rrbracket(w) = 1 \text{ and } \forall q \in \text{ALT}. (S \not\subseteq q \rightarrow q(w) = 0)$$

This says that an exhaustified version of a sentence  $S$  means that  $S$  is true, and all relevant alternatives that do not entail  $S$  are false.

Herburger (2015a) adopts Chierchia et al.’s view, but she proposes a modification. She claims that at least some exhaustified sentences are not obtained by simply applying  $O_{ALT}$  to the sentence (i.e.  $O_{ALT}S$ , as Chierchia et al. 2011 have), but instead as the result of the conjunction  $S \wedge O_{ALT}S$  (I will refer to this as the *conjunction approach*).<sup>71</sup> Here is an example of a simple case with the quantifier ‘some’ (with  $O_{ALT}$  written as *only*, and the unpronounced material struck through) (Herburger 2015a: 7):

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<sup>71</sup>Herburger provides some empirical support in defense of the conjunction approach. In the domain of conditionals this evidence takes the form of data that suggest that an exhaustified conditional answer can be interpreted differently from a conditional that contains an explicit operator ‘only’ (i.e. an *only-if* conditional). I will not review this argumentation here for reasons of space, but refer the interested reader to Herburger (2015a: 12).

(196) Ben ate SOME of the biscotti ~~and Ben only ate SOME of the biscotti.~~

The combination of the conjunction approach with the idea that conditional perfection is an instance of exhaustification, gives a precise interpretation of a perfected conditional: ' $(p \rightarrow q) \wedge O_{ALT}(p \rightarrow q)$ '. Conditional perfection is thus analyzed directly parallel to other Q-implicatures as in (196):

(197) If you work HARD you will succeed ~~and only if you work HARD you will succeed.~~

(Herburger 2015a: 7)

The hardest part of Herburger's proposal is explaining what 'only if  $p$ ,  $q$ ' means, so that we can establish that  $(p \rightarrow q) \wedge O_{ALT}(p \rightarrow q)$  indeed corresponds to the conditional perfection inference. This is a difficult problem that has been studied by Herburger in other work (Herburger 2015b, see also von Stechow 1997). In brief terms, Herburger claims that when conditionals are in the scope of a downward entailing operator, they have existential rather than universal force ('Conditional Duality'; Herburger 2015b).

(198) *Herburger's Conditional Duality* (Herburger 2015a,b)

Conditionals are interpreted:

with existential force:  $\exists w'[R(w, w') \wedge p(w') \wedge q(w')]$  when under the scope  
of a DE operator

with universal force:  $\forall w'[(R(w, w') \wedge p(w')) \rightarrow q(w')]$  elsewhere

This means that when a conditional is perfected, the conditional in the first conjunct is computed with universal force, since it is not under the scope of a downward entailing operator. Hence, this provides a sufficient reason for  $q$ . The conditional in the second conjunct is under the scope of  $O_{ALT}$ , and hence by Conditional Duality, gets an existential interpretation.<sup>72</sup> The negation of all

<sup>72</sup>'Only' is not classically downward entailing, but it is Strawson downward entailing (von Stechow 1999). This roughly means that it is downward entailing assuming that its presuppositions are met. I take it that Herburger (2015b) meant this weaker condition for when conditionals are interpreted with existential force in (198).

alternatives amounts to a necessary condition for  $q$ . For the lawn-mowing example (175), this works out as follows:

(199) Conditional perfection in Herburger’s theory

$$\begin{array}{ccc} (p \rightarrow q) & \wedge & O_{\text{ALT}}(p \rightarrow q) \\ \uparrow & & \nwarrow \\ \text{universal force} & & \text{existential force} \end{array}$$

$$\forall w' [(R(w, w') \wedge p(w')) \rightarrow q(w')]$$

*in all relevant worlds in which you mow the lawn, I give you \$5*

for each alternative  $p'$ :  $\neg \exists w' [R(w, w') \wedge p'(w') \wedge q(w')]$

*there is no relevant world in which you clean the garage and I give you \$5*

*there is no relevant world in which you do the dishes and I give you \$5 ...*

The analysis of conditional perfection as the result of applying a grammatical exhaustivity operator raises the question of whether conditional perfection can occur in an embedded position.<sup>73</sup> Since  $O_{\text{ALT}}$  is a syntactic operator, in embedded structures it can combine both at the level of the embedded clause and at the level of the matrix clause, potentially giving rise to different implicatures. Herburger (2015a) herself does not address questions about embeddability in her account, although I believe there are some interesting questions about the combination of embedding and the conjunction approach (because now the entire  $S' \wedge O_{\text{ALT}}(S')$  complex must be embedded).

There is a large body of literature on the existence and nature of embedded implicatures, both from experimental and theoretical perspectives (to mention just a few, Chierchia 2004; Geurts and Pouscoulous 2009; Ippolito 2010; Sauerland 2010; Chierchia et al. 2011 and references therein). I am not aware of discussion of embedded conditional perfection in the conditional perfection literature.<sup>74</sup> The syntactic shape of a conditional makes it hard to embed them in some of the contexts that are typically used to investigate embedded implicatures (e.g. disjunction or negation,

<sup>73</sup>Thanks to Yael Sharvit (p.c.) for raising this issue.

<sup>74</sup>In the analysis of an unrelated problem about conditionals, Kratzer (to appear) assumes that conditional perfection can take place under the scope of the quantifier ‘most’. She does not provide data or arguments that embedded conditional perfection is possible in general.

as in [Chierchia et al. 2011](#)).<sup>75</sup> Of course, conditionals may be embedded under propositional attitude verbs:

(200) John believes that if he had mowed the lawn, he would have got \$5.

The difference in having belief about a conditional and a biconditional relationship is a subtle judgment, and I am not willing to draw any conclusions on the basis of my own introspection (cf. [Geurts and Poussoulous 2009](#)). A related question is whether the computation of contrastive topic is a local phenomenon. [Wagner \(2012: 23-5\)](#) presents the following example to illustrate the lack of embeddability.

(201) Do you think Mary was involved in the candy store robbery?

- a. She likes [sweets]<sub>L+H\* L-H%</sub>...
- b. John believes she likes [sweets]<sub>L+H\* L-H%</sub>...

In sentence (201b) the implicature resulting from the intonation contour on ‘sweets’ (namely, that Mary was possibly involved in the robbery) is generated for the speaker, and not for John. (There is a question here whether the indicated intonation contour should be analyzed as contrastive topic, or as a distinct phenomenon, which Wagner calls rise-fall-rise (RFR). See [Wagner 2012: §2.4](#) and [Constant 2014: §3.6](#) for different perspectives on this issue). I leave these questions about embedding and conditional perfection for future research.

Wrapping up my review of [Herburger \(2015a\)](#), I see two main advantages of using Herburger’s theory to derive my claim about multiple cause contexts. First, the theory is general enough to apply to subjunctive conditionals. Second, because it unites the phenomenon of conditional perfection with other exhaustification phenomena (such as exhaustive answers), it offers a natural way of explain that the generation of  $CF_q$  depends on the question-answer structure of the discourse. I will turn to this last point now.

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<sup>75</sup>[Leahy \(2011: 273\)](#) makes a similar point about the limited knowledge about the behavior of conditional presuppositions in embedded positions.

### 6.3.3 Exhaustivity and multiple cause contexts

Herburger herself does not have much to say about the contextual restrictions of conditional perfection (question (190b)), other than that “whether Conditional Perfection, an upper-bounding inference or an exhaustive reading of an answer is intended is a *pragmatic matter*” (Herburger 2015a: 12, my emphasis). However, my claim that conditionals in multiple cause contexts do not get perfected can be derived very naturally in this framework. In a multiple cause context, there is more than one cause for the same consequent salient (say,  $p_1 \rightarrow q$  and  $p_2 \rightarrow q$ ). Then it is clear that the exhaustified interpretation ‘ $[p_2 \rightarrow q] \wedge O_{ALT}(p_2 \rightarrow q)$ ’ corresponding to conditional perfection is not intended, because the alternative cause  $p_1$  in  $p_1 \rightarrow q$  directly conflicts with this interpretation. One may compare this situation to the discussion of exclusivity implicatures and contrastive topic in section 4.7. Recall that Sæbø’s (2004) explanation of the infelicity of ‘#John lives in France, and [Mary]<sub>CT</sub> lives in France’ was that the exclusivity implicature of contrastive topic on ‘Mary’ (namely, that only Mary lives in France) conflicts with the earlier statement that John lives in France. A very similar situation holds in this case when  $O_{ALT}$  applies to a second conditional with the same consequent.

Contextual restrictions on conditional perfection can then be explained by studying restrictions in the domain of exhaustive answers. For example, one instance where answers are not taken to be exhaustive are so-called **mention-some questions**. A question ‘Where can I buy an Italian newspaper?’ (Groenendijk and Stokhof 1984: 278) is most typically not a request for an exhaustive list, but only for a single answer (the closest or most convenient place). This is an example of an answer to a question that is not intended to be exhaustified, and the  $O_{ALT}$  is not applied ( $O_{ALT}$  is optional in Chierchia et al.’s (2011) theory). A conditional can be a mention-some answer as well, for example when the lawn-mowing example (175) is an answer to a QUD ‘How can I earn five dollars?’ that does not require an exhaustive list (von Stechow 2001: 19). Also the lack of conditional perfection in ‘discourse unperfectables’ in (180), repeated below, can now be explained.

- (202) a. If this cactus grows native to Idaho, then it is not an *Astrophytum*.  
 ↗ If this cactus doesn't grow native to Idaho, it is an *Astrophytum*.
- b. If you scratched on the eight-ball, then you lost the game.  
 ↗ If you didn't scratch on the eight-ball, then you didn't lose the game.

There is no conditional perfection because these are not exhaustive answers to the questions 'When is this an *Astrophytum*?' and 'When do you lose the game?'.<sup>76</sup>

Of course, it would be desirable to have a theory that predicts whether a question is interpreted as requiring a mention-some or a mention-all answer. I believe, however, that this problem is orthogonal to the point I am making here, namely showing how conditional perfection is affected by mention-some interpretations. Moreover, determining whether a question is to be interpreted as mention-some or mention-all depends for a large part on extralinguistic factors. For example, [Groenendijk and Stokhof \(1984\)](#) observe that mention-some interpretations typically arise with verbs "tied to typical human concerns" (p. 544). More formally, [van Rooij \(2004\)](#) applies Bayesian decision theory to the semantics and pragmatics of questions. He shows how a 'utility value' can be computed for questions, and this helps the interlocutors resolve whether a mention-some or mention-all answer counts as the optimal answering strategy for the QUD in a given context. Seeing how such a theory might apply to subjunctive conditionals, and eventually to the data with conditional perfection discussed in this chapter, I leave for future research.

Returning to counterfactuality, we predict, via Karttunen's schema, that when a subjunctive conditional is not an exhaustive answer to the question under discussion, we do not find the  $CF_q$  inference being generated. In section 6.4 I will turn to testing this, and other predictions made by Karttunen's schema.

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<sup>76</sup>It should be noted that (202a) is a 'definitional' conditional, i.e. it does not give a causal relationship but provides a definition for what counts as an *Astrophytum*. [Thompson and Byrne's \(2002\)](#) experimental study investigates the difference between causal and definitional conditionals (they used stimuli like 'If the animal had been warm blooded, then it would have been a mammal'). Participants accepted a 'denying the antecedent' inference (if not  $p$ , then not  $q$ ) less often for definitional conditionals than for causal conditionals (35% vs. 50% for subjunctives). This may be an independent reason for why we find no conditional perfection in cases like (202a).

## 6.4 Predictions: cancellation of $CF_q$

So far, in this chapter I have talked about restrictions on conditional perfection, including the novel claim that multiple cause contexts block conditional perfection. By our revised version of Karttunen's schema in (185), we predict that in all cases in which no conditional perfection takes place, no  $CF_q$  is triggered. I will now check the predictions listed in Figure 4 (page 127) in the order given there. I start with concessive and biscuit conditionals, and then turn to multiple cause contexts, including the ones constructed in section 4.6 without the presence of an additive particle. This will make up all the contexts given in the 'third class' of  $CF_q$ -cancellation contexts in chapter 2. A concise summary of all this is given in Table 3 (page 151).

**1. Semifactuals or concessive conditionals** (Horn 2000: 318; van Canegem-Ardijns and van Belle 2008: 167). Recall that semifactuals (to be discussed further in section 7.3.1) are *even if*-conditionals with the semantic property that there is no causative link between antecedent and consequent conveyed:

(203) Even if the bridge were standing, I wouldn't cross. (Bennett 1982)

no conditional perfection:  $\nrightarrow$  if the bridge were not standing, I would cross

no  $CF_q$ :  $\nrightarrow$  I did cross

We find that this sentence implies the truth of the consequent, i.e. that I won't cross. Hence, semifactuals combine a lack of conditional perfection (the inference 'if the bridge were not standing, I would cross' is not made) with a lack of  $CF_q$ . While earlier literature has explained why these conditionals entail the truth of  $q$  (e.g. Barker 1991; Guerzoni and Lim 2007), we now also have an explanation why the apparent violation of  $CF_q$  is licensed.

**2. Biscuit conditionals** (Horn 2000: 317; van Canegem-Ardijns and van Belle 2008: 366). Biscuit conditionals are most often indicative conditionals, but they can also be subjunctive (Swanson 2013). Swanson's example in (204a) is a type of modal subordination set up by 'wish', but in



(204b) there is different kind of example of a subjunctive biscuit conditional.

(204) a. I wish we had decided to vacation in a posh hotel in London. We would have had tea every afternoon, and there would have been biscuits on the sideboard, if one had been so inclined. (Swanson 2013: 638)

b. A: I am not hungry.

B: I am glad you're not hungry, but if you had been hungry, there would've been biscuits in the cupboard.

What subjunctive and indicative biscuit conditionals have in common is the characteristic property that the truth of the consequent is implied: there are cookies whether or not we had been so inclined (in (204a)), and whether or not I had been hungry (in (204b)).

Clearly neither the indicative nor the subjunctive biscuit conditionals invite the inference that if the antecedent is false, there are no biscuits. So again, we have a conditional that combines a lack of conditional perfection with a lack of  $CF_q$ .

**3. Non-exhaustive conditional answers** The conditionals that I provisionally called “discourse unperfectables” in the introduction to this chapter (and in Figure 4), we now analyze as cases in which the conditional is not taken to be an exhaustive answer. Von Fintel’s (2001) proposal discussed in the previous section introduces some additional predictions for my account of the cancellation of  $CF_q$ . When a counterfactual conditional is a non-exhaustive answer to the QUD, there is no conditional perfection, and hence no  $CF_q$ . One example of (indicative) non-exhaustive conditional answers that von Fintel mentions that I haven’t discussed above, are yes/no-questions on the antecedent  $p$ .

(205) Q: Will the TV work if it is humid?

A: Yes, the TV will work if it is humid.

This is clearly not perfected into ‘the TV won’t work if it is not humid’. My account predicts that in subjunctive counterparts of these, we should find cancellation of  $CF_q$ . Example (206) is my

attempt at creating such a subjunctive conditional (this was my (34) from chapter 2).

(206) [context: John took the subway and was on time. I am interested in the punctuality of different means of transport.]

Q: If John had taken the bus, would he have been on time?

A: Yes, if John had taken the bus, he would have been on time.

We find that this can be uttered in a context in which we know that  $q$  is true, so indeed  $CF_q$  gets cancelled.<sup>77</sup>

**4. Multiple cause contexts** The most important thing that we can now explain is why  $CF_q$  is cancelled in multiple cause contexts. One type is formed by conditionals with non-local ‘also’ (chapter 3). These are multiple cause contexts (chapter 4), which block conditional perfection, hence by Karttunen’s schema do not generate  $CF_q$ . As explained in section 4.6 though, not all multiple cause contexts require marking by non-local ‘also’, as this also depends on the discourse structure. Of course, we predict that  $CF_q$  is not found in *any* multiple cause context, no matter how it is marked. I presented two cases in section 4.6 of multiple cause contexts in which an additive particle is not required: listing contexts, and exhaustive focus constructions. Although these have the same surface structure as conditionals with non-local ‘also’, their discourse structures deviate from the CT-F structure of conditionals with non-local ‘also’. As a result, the Repeated Focus Constraint does not apply to them. Listing contexts are the fourth and final case from the ‘third class’ of  $CF_q$ -cancellation contexts from chapter 2 that we can now account for.

#### Listing intonation

Recall from (126) (on page 88) that listing intonation licenses multiple causes without the need of an additive particle. Its conditional counterpart in (128), repeated below, is a  $CF_q$ -cancellation

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<sup>77</sup>Arguably this is just a variant of the  $CF_q$ -cancellation contexts with ‘also’ (B might have responded *Yes, if John had taken the bus, he would ALSO have been time*). In that case von Stechow’s case of yes/no-questions on the antecedent  $p$  forms an instance in which the obligatoriness of an additive particle (see section 4.6) is weakened because of the discourse structure.

context (recall also (33) in chapter 2, and (6) in the preview).

(207) [Speaker A played a game show in which eight of the ten boxes contain \$100.]

A: I won \$100! I am so happy.

B: Well, that wasn't so hard really: if you had opened Box A, you would have won \$100, and if you had opened Box B, you would have won \$100, and if you had opened Box C, you would have won \$100, ... [with listing intonation, H-L%]

The key point is that (207) cancels  $CF_q$ : the context makes it clear that 'I won \$100' is true, and Speaker's B conditionals have consequents that are true, yet they are felicitous.

### Exhaustive focus

The second case, in (125) and repeated below, was that of exhaustive focus: here the position of the F-marking was reversed from the usual CT-F pattern that requires a postposed stressed additive particle.

(208) (Who lives in France?) (= (125))

[John]<sub>F</sub> lives in France, and [Mary]<sub>F</sub> lives in France.

There is a little complication here when making the point that the conditional counterpart blocks  $CF_q$  if we try to imitate the context from (207) above. This is because the F-marking suggests that the answer is to be interpreted exhaustively: in (208), John and Mary are the *only* (relevant) persons that live in France. Imagine that Box A and Box B are the only boxes that contain \$100. Then there is a problem with  $CF_p$ : speaker A either opened Box A or Box B, but then B's utterance in (209) violates  $CF_p$ .

(209) A: I won \$100.

B: #If you had opened [Box A]<sub>F</sub>, you would have won \$100, and if you had opened [Box B]<sub>F</sub>, you would have won \$100.

We can solve this problem by changing the context. Suppose that Speaker A won \$100 by opening Box A, and incorrectly believes that Box A was the only one that contains \$100. Speaker B then corrects A, and says that Box A and Box B both contain \$100.

(210) A: I won \$100. It was a good thing that I picked Box A, because all the other boxes were empty!

B: No that's not right. If you had opened [Box A]<sub>F</sub>, you would have won \$100, and if you had opened [Box B]<sub>F</sub>, you would have won \$100.

Here, the consequent of B's counterfactual conditional is true given A's utterance, so  $CF_q$  is cancelled and yet the conditional is felicitous.

A concise summary of the predictions made about  $CF_q$  for the various contexts discussed in this section is given in table format in Table 3 below.

Class*	Type	Example	CF <sub>q</sub> cancelled?	MCC?†	Predictions about CF <sub>q</sub>
1	subjunctive conditionals with non-local ‘also’	(87b)	yes	yes	non-local ‘also’ associates with contrastive topic in the antecedent, which generates alternatives that function as multiple causes for the same consequent; multiple cause contexts do not have conditional perfection; hence no CF <sub>q</sub> by Karttunen’s schema
3	semifactuals	(203)	yes	no	do not have conditional perfection; hence no CF <sub>q</sub> by Karttunen’s schema
3	subjunctive biscuit conditionals	(204)	yes	no	do not have conditional perfection; hence no CF <sub>q</sub> by Karttunen’s schema
3	non-exhaustive conditional answers	(206)	yes	no	do not have conditional perfection; hence no CF <sub>q</sub> by Karttunen’s schema
3	listing contexts	(207)	yes	yes	explicitly express multiple causes‡; multiple cause contexts do not have conditional perfection; hence no CF <sub>q</sub> by Karttunen’s schema
	exhaustive focus contexts	(210)	yes	yes	explicitly express multiple causes (focused antecedents with the same consequent)‡; multiple cause contexts do not have conditional perfection; hence no CF <sub>q</sub> by Karttunen’s schema
	subjunctive conditionals with local ‘also’	(87a)	no	no	local ‘also’ focus-associates with material in the consequent, which generates alternatives that <b>do not</b> function as multiple causes; hence no CF <sub>q</sub> -cancellation is predicted

\* Class number corresponding to the three-way distinction from chapter 2.

† Multiple cause context.

‡ These two contexts license a violation to the Repeated Focus Constraint, as discussed in section 4.6.

Table 3. Predictions for various CF<sub>q</sub>-cancellation contexts

## 7 $CF_q$ -cancellation with ‘still’

My story about the role of discourse in the generation of counterfactual inferences started with a discussion of the  $CF_q$ -cancellation contexts with the additive particle ‘also’. The main empirical claim from chapter 3 was that some but not all occurrences of ‘also’ in the consequent of a subjunctive conditional cancel  $CF_q$ . Those occurrences of ‘also’ that cancel  $CF_q$  I called ‘non-local’, as they systematically associate with material in the antecedent of the conditional. In chapter 4 I showed that conditionals with non-local ‘also’ indicate multiple cause contexts, which is the reason that no  $CF_q$  is generated for them (via the connection with conditional perfection and Karttunen’s schema; chapters 5, 6). I was able to reach a more general conclusion, because I showed that there exist multiple cause contexts without ‘also’ (section 4.6), as well as contexts that block conditional perfection for some other reason than being a multiple cause context (section 6.4). These made up the  $CF_q$ -cancellation contexts from ‘class 3’ in chapter 2.

I have not yet discussed the last class of  $CF_q$ -cancellation contexts from chapter 2, those involving the word ‘still’. In chapter 2 I observed that the situation for ‘still’ is similar to that for ‘also’: some but not all instances of ‘still’ in the consequent of a subjunctive conditional lead to cancellation of  $CF_q$ . The crucial contrast (29)/(31) is repeated here:

(211) A: We are on time because we have taken the road I said we should take.

B: If we’d taken the other road, we would **still** have been here in time.

(212) A: John had been singing for an hour when someone rang at the door, and he stopped.

B: If John hadn’t heard the doorbell, he would **still** have been singing.

In (211), we find that  $CF_q$  is cancelled: B’s utterance is felicitous in a context in which we were on time (as established by A’s utterance). In (212), however,  $CF_q$  is not cancelled: the inference that John is not singing anymore is generated in the normal fashion. This can also be seen by considering what happens when the context entails that  $q$  is true, i.e. that John was still singing. Then (212) becomes infelicitous (one might reply ‘Wait a minute! He IS still singing’):

(213) [John had been singing for an hour, when the doorbell rang. He heard the bell, but decided to just continue singing.]

#If John hadn't heard the doorbell, he would still have been singing.

There is thus a similarity between the local/non-local contrast of 'also' on the one hand, and the contrast with 'still' exemplified in (211)/(212). Moreover, we would like to account for the  $CF_q$ -cancellation in (211) by using the same general argument I applied to all the previously discussed  $CF_q$ -cancellation contexts: showing that the lack of  $CF_q$  is the result of a lack of conditional perfection. These two points raise the question if we can apply any of our theoretical insights from chapter 4 to the data with 'still'. Unfortunately, there are a number of reasons why the puzzle about 'still' is different (and harder) than for 'also'.

First, non-local 'also' had the regular meaning that an additive focus particle has in other (non-conditional) contexts. On the other hand, when 'still' cancels  $CF_q$  it does not seem to have the meaning it has in non-conditional sentences. Rather, when used in this way, 'still' and 'also' have a very similar meaning, and often appear to be interchangeable. This is in strong contrast with 'still' in non-conditional sentences, in which the meaning of 'still' and 'also' are clearly distinct.<sup>78</sup>

(214) a. If we'd taken the other road, we would **still/also** have been here in time.

↳  $CF_q$ -cancellation: 'still' and 'also' have (roughly) the same meaning

b. John is **still** eating ≠ John is **also** eating

↳ non-conditional context: 'still' and 'also' have different meanings

I say that 'still' and 'also' in (214) have *roughly* the same meaning. This is because these types of data have hardly been discussed in previous literature, and the amount of data considered in this dissertation is too small to draw the general empirical conclusion that there is no difference in meaning or usage. It may thus be the case that there are certain subtle differences between 'also' and 'still' that have not become apparent from the small set of data we have considered thus

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<sup>78</sup>Interestingly, the German word *noch* and its Dutch cognate *nog* (both mean 'still') have a use that does not exist in English, with a meaning that has some similarities with that of an additive particle. See Umbach (2009, 2012) for an analysis of the German data.

far. In Appendix A I report on experiments I conducted to see how linguistically untrained native speakers of English in various contexts judge conditional sentences with ‘also’ and ‘still’ of the type we have been considering. As these findings are not about the basic contrast in (211)/(212), they will not affect the theoretical discussion in this chapter.

The second reason why the puzzle for ‘still’ is harder than that for ‘also’ is that whereas there is basically a single meaning for ‘also’ as an additive particle, ‘still’ is used in a number of different ways: as will be discussed shortly, these have been labeled ‘aspectual’, ‘concessive’, ‘marginality’, and ‘exclusive’. There will thus be some extra work in seeing how this four-way distinction relates to the two usages of ‘still’ in (211)/(212).

Finally, other than for ‘also’, there appears to be no difference in the intonation of ‘still’ in (211) and (212).<sup>79</sup> I relied heavily on prosodic properties of local and non-local ‘also’ in chapter 4, as they formed the basis of the parallel with postposed stressed additive particles. Given the lack of clear prosodic differences for ‘still’, such an approach will not be possible here.

In conclusion, the puzzle concerning ‘still’ is not only to explain when it does or does not cancel  $CF_q$  (this is what comprised the puzzle about ‘also’ and other cancellation contexts), but also to explain how ‘still’ comes to mean what it means in (211).

**Outline of the chapter** I will argue that the difference between (211) and (212) lies in the position at which ‘still’ is interpreted semantically. I will refer to the use of still as in (212) as **consequent-internal** ‘still’, because there ‘still’ is semantically part of the proposition of the consequent. The type of  $CF_q$ -cancelling ‘still’ in (211) I will refer to as **consequent-external**. The consequent-internal/consequent-external distinction is similar to the local/non-local distinction I made for ‘also’, but we will see that there are a number of important differences, so that the cost

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<sup>79</sup>It appears that both types of ‘still’ are stressed, see Appendix B. There is some work on stressed ‘still’, for example [ter Meulen \(2004\)](#) and [Smessaert and ter Meulen \(2004\)](#) suggest that stressed ‘still’ indicates that the speaker has a certain (negative) attitude towards the duration of an activity:

- (i) When Mary arrived, John was STILL asleep. (ter Meulen 2004: 242)  
(speaker thinks John’s being still asleep was unexpected or undesirable)

I assume this is not what is going on in my conditional data in (211) and (212), since in those cases there is no negative attitude. Arguably, the observation in (i) is not specific to the lexical item ‘still’, but in line with a more general phenomenon that certain intonations may indicate a negative attitude.



of introducing this new terminology is justified.

First, I will review previous empirical classifications of different uses of ‘still’ (section 7.1). The first half of the chapter will then be devoted to the simpler case of consequent-internal ‘still’. The main claim is that those instances of ‘still’ are correctly described by existing theories, although certain modifications need to be made. I review Ippolito’s (2007) theory of aspectual ‘still’ (section 7.2.1) and show that two technically important but conceptually non-essential modifications are needed. After reviewing the semantic part of Ippolito’s (2006) theory of subjunctive conditionals (section 7.2.2, following up on section 5.2.3), I derive the meaning of consequent-internal ‘still’ formally in section 7.2.3.

I will shift my attention to consequent-external ‘still’ in section 7.3. My analysis of consequent-external ‘still’ starts with observing the special behavior of ‘still’ in modal environments. In section 7.4 I introduce two new sets of data that illustrate this: ‘still’ in counterfactual readings of modals of the past (from Condoravdi 2002), and ‘still’ in modal subordination contexts. I draw parallels between consequent-external ‘still’ and ‘still’ as used in modal subordination contexts. The main claim is that consequent-external ‘still’ takes wide scope over the modal verb inside the conditional. Hence, the consequent-internal/consequent-external distinction amounts to a difference in scope between ‘still’ and the modal verb inside the conditional.

## 7.1 Uses of ‘still’

Previous literature has described several different uses of the English word ‘still’. In this section I will give a short empirical overview of the four-way classification from Ippolito (2007). I will use the corresponding terminology throughout the chapter in order to see how it relates to the consequent-internal/consequent-external distinction in (211)/(212). Later on I will also review and modify Ippolito’s theoretical proposal behind the classification.

The examples in (215), taken from Ippolito (2007), illustrate four different types, labeled *aspectual*, *marginality*, *exclusive*, and *concessive*:

- (215) a. John is still eating. [aspectual ‘still’]
- b. Compact cars are still safe; subcompacts start to get dangerous. [marginality ‘still’]
- c. Got an A! I was jumping for joy (internally, keep in mind it’s still 8 a.m.)  
[exclusive ‘still’]
- d. John studied all night, but he still failed the test. [concessive ‘still’]
- e. Even if the doctor tells him not to, Harry will still run the marathon.  
[concessive ‘still’]

The most common use of ‘still’ is called *aspectual*, and may informally be thought of as expressing the uninterrupted temporal continuation of an eventuality from a time in the past up to the reference time. For example in a simple sentence such as ‘John is still eating’, ‘still’ conveys that there was an eventuality of eating by John at some point in the past, and that this eventuality has continued without interruption until the time of utterance.

Sentence (215b) illustrates a *marginality* use of ‘still’. This use is connected with gradable adjectives: what (215b) does is that it positions different types of cars on a scale of safety via the adjective ‘safe’.<sup>80</sup>

*Exclusive* ‘still’, exemplified in (215c), has a meaning similar to the particle ‘only’; in this example it expresses that it is only 8 a.m., or that it is not yet an expected (later) time. This use of ‘still’ is not available to all English speakers (Ippolito 2007: 2n).

Finally, *concessive* ‘still’ is given in the sentences in (215d) and (215e). As the label indicates, in these examples ‘still’ conveys a concessive interpretation. In general, a concessive construction relates two propositions *p* and *q*. It asserts the truth of *p* and *q* and presupposes that *p* and *q* are “generally incompatible” (König 2010). It is prototypically expressed by connectives (‘although *p*, *q*’ / ‘even though *p*, *q*’), but also by adverbs (‘still’, ‘nevertheless’, etc.; see König 2010 for an overview). In this case concessive ‘still’ indicates a contrast between studying all night and failing the test (in (215d), and a contrast between Harry’s running the marathon and the doctors advice

<sup>80</sup>Ippolito only considers marginality ‘still’ with gradable adjectives, but other types (e.g. spatial marginality) have been considered in other literature (see Löbner 1989: 204-205; Umbach 2009).

against it (in (215e)).

## 7.2 Consequent-internal ‘still’

I will argue that the when ‘still’ is used as in (212), it is part of the proposition of the consequent. That is, the structure of the conditional is as follows:

(216) if [... *p* ...], would [ still VP ]

I will therefore refer to this type of ‘still’ as **consequent-internal** ‘still’.

Taking this approach makes a few predictions. First, we expect that the meaning of (216) is that of ‘still’ but embedded inside a counterfactual conditional. This is indeed true for (212), repeated here.

(217) A: John had been singing for an hour when someone rang at the door, and he stopped.

B: If John hadn’t heard the doorbell, he would **still** have been singing.

Note first that this is an example of aspectual ‘still’: the sentence is about the temporal continuation of John’s singing. The difference with a non-conditional sentence as in (215a) is that in (217) this continuation is embedded in the conditional. In (217) there is a certain event (that of John’s singing) that took place in the actual world, but did not continue beyond a certain point (the doorbell) in actual fact (i.e. we have our regular  $CF_q$ ). The sentence gives a hypothetical condition under which it would have continued, namely if he hadn’t heard the doorbell. We thus find the continuation interpretation of aspectual ‘still’, but embedded in a counterfactual conditional. In the remainder of this section I will show how this meaning is derived formally by combining Ippolito’s (2007) account for aspectual ‘still’ and a semantics for subjunctive conditionals.

A second prediction from (216) is that we expect other types of ‘still’ in (215) (i.e. non-aspectual types of ‘still’) to be possible here as well. This is indeed true, although it is a little difficult to construct data showing this. This is because concessive, exclusive, and marginality ‘still’ are more restricted in their distribution than aspectual ‘still’. For example, concessive ‘still’

(see (215d/e)) requires two propositions, which is difficult inside the consequent of a conditional for independent (syntactic) reasons. Exclusive ‘still’ is not accepted by all speakers of English. Here follows an example of consequent-internal marginality ‘still’:

(218) Compact cars are still safe, subcompacts start to get dangerous. This is because many companies that make subcompacts are in Asian countries that don’t have strict safety laws for cars. If only US companies built subcompacts, subcompacts would still be safe.

This is admittedly a somewhat contrived sentence, but that does not affect the point I am making: the meaning of the underlined conditional in (218) is that of marginality ‘still’, but embedded within a conditional.

Finally we predict that since we do not alter the meaning of ‘still’ (but only combine it with a counterfactual context), we predict to see the normal meaning difference between ‘still’ and ‘also’ as in (214b). This is indeed true: in (217) ‘still’ has an aspectual interpretation and not that of ‘also’, in (218) ‘still’ has a marginality interpretation and not that of ‘also’.

All these three properties contrast with  $CF_q$ -cancelling ‘still’ in (211), which I will now refer to as **consequent-external** ‘still’. The summary of the contrast between consequent-internal and consequent-external looks as follows (the claims in the rightmost column will be further discussed in section 7.3)

(219)	consequent-internal ‘still’	consequent-external ‘still’
type of ‘still’?	can be any type in (215)	one specific type
meaning w.r.t. ‘also’?	meaning distinct from ‘also’	meaning similar to ‘also’
$CF_q$ -cancellation?	no cancellation	cancellation

In the remainder of this section I will show how to derive the meaning of (217) formally.

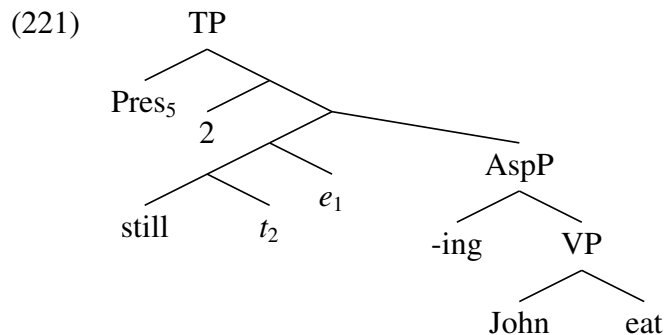
### 7.2.1 Event-based accounts of aspectual ‘still’

A theory of aspectual ‘still’ that has been influential is the one developed in [Ippolito \(2007\)](#) (a similar proposal is made by [Greenberg 2009](#)), which may be called an *event-based account*. The basic idea of such an account is that aspectual ‘still’ presupposes the existence of an event in the past, and asserts that that *same* event continues to the time of utterance. This is reflected in the following semantics for aspectual ‘still’ by [Ippolito \(2007\)](#):<sup>81</sup>

$$(220) \quad \llbracket \text{still}_{\text{aspectual}} \rrbracket^{c,g,w} = \lambda t_i . \lambda e_{\ell} . \lambda P_{\langle \ell, \langle i, t \rangle \rangle} : \exists t' < t [P(e)(t') = 1] . P(e)(t) = 1$$

Aspectual ‘still’ takes a time variable, an event variable, and then an aspectual proposition (which denotes a relation between events and times). The crucial point about (220) is that the event variable  $e$  is the same in the presupposition and the assertion: informally, ‘still’ presupposes that there was a  $P$ -event  $e$  at time  $t'$ , and it asserts that the *same* event  $e$  is a  $P$ -event at a later time  $t$ .

The semantic structure of a simple sentence ‘John is still eating’ is as follows in [Ippolito’s](#) theory:



[Ippolito](#) illustrates her account with simple sentences of the type ‘John is still eating’, but my goal is to embed aspectual ‘still’ in a counterfactual conditional, i.e. in a modal context, in order to account for (217). As we will see, this more complicated application of [Ippolito’s](#) theory means that two aspects of the representation in (221) require modification: first, the constitution of the

<sup>81</sup>Throughout this chapter I will decorate variables with their type.  $\ell$  is the type of eventualities,  $i$  is the type of time intervals,  $s$  is the type of worlds,  $t$  is the type of truth values.

AspP projection, and second, the role of the event variable  $e_1$ . I will discuss these two points in turn in the process of explaining the structure and derivation of (221), to which I turn now.

**The propositional argument: AspP** Ippolito assumes that the propositional argument of ‘still’ is an aspectualized proposition  $P$  of type  $\langle \ell, \langle i, t \rangle \rangle$ . The meaning of the operator ‘-ing’ is derived from Kratzer’s (1998) imperfective operator, and is defined as follows:

$$(222) \quad \llbracket \text{-ing} \rrbracket^{c,g,w} = \lambda P_{\langle \ell, t \rangle} \lambda e_{\ell} \lambda t_i. (t \subseteq \text{time}(e) \wedge P(e) = 1) \quad (\text{Ippolito 2007: 8})$$

The bare proposition ‘John eat’ is taken to be a function from events to truth values (type  $\langle \ell, t \rangle$ ). However, Ippolito assumes that predicates start off as properties of times, and she employs the \*-operator from Kratzer (1998) to change a property of times into a property of events:

$$(223) \quad \llbracket *P_{\langle i, t \rangle} \rrbracket^w = \lambda e_{\ell}. \forall w' (\llbracket P \rrbracket^{w'}(\text{time}(e)) = 1) \quad (\text{Ippolito 2007: 8})$$

$$\text{example: } *[\lambda t_i. \text{John eats at } t \text{ in } w] = \lambda e_{\ell}. \forall w' (\text{John eats at } \text{time}(e) \text{ in } w')$$

The employment of the \*-operator raises some problems. As a result of the universal quantification over worlds in (223), the world dependence of  $P$  is lost: the world parameter  $w$  does not appear anywhere on the right side in (223).<sup>82</sup> If  $P$  does not depend on the world of evaluation, the meaning of the entire sentence (221) does not depend on the world of evaluation either. In order to see this, I have given the entire derivation of (221) in (224) (this follows Ippolito’s own derivation from 2007: 10).

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<sup>82</sup>In an older version of Ippolito’s theory for ‘still’, in Ippolito (2004a), she uses the \*-operator without universal quantification. Why she added this in the 2007 version is not clear. Kratzer’s (1998) original definition – both the formal version, and its textual paraphrase – makes clear that she intended the (unrestricted) universal quantifier, without explaining the need for it:

(i)  $*P_{\langle i, \langle s, t \rangle \rangle} = [\lambda e_{\ell}. \lambda w_s. \forall w'_s (P(\text{time}(e))(w') = 1)]$  (p. 105)  
 “the property of times  $[\lambda t \lambda w. \text{Mary is pregnant at } t \text{ in } w]$ , for example, is mapped into the property of eventualities  $Q$  such that for all eventualities  $e$  and worlds  $w$ ,  $Q(e)(w) = 1$  iff in all possible worlds, the time of  $e$  is a time when Mary is pregnant”

In (246) below, I will consider a variant of the \*-operator without universal quantification, i.e.  $\llbracket \circ P_{\langle i, t \rangle} \rrbracket^w = \lambda e_{\ell}. (\llbracket P \rrbracket^w(\text{time}(e)) = 1)$ .

(224) *Ippolito's derivation of 'John is still eating' in (221)*

[[ John is still eating ]]<sup>*g,w,t*</sup> is defined when

(i)  $g(4) \circ t$ ;

(ii)  $\exists t' < g(4)[t' \subseteq \text{time}(e_1) \wedge \forall w'(\text{time}(e_1) \text{ is a time that John eats in } w')]$ .

When defined, the sentence is true if

$g(4) \subseteq \text{time}(e_1) \wedge \forall w'(\text{time}(e_1) \text{ is a time that John eats in } w')$ .

That the meaning of the sentence comes out as world-independent may not be so problematic for the example sentence 'John is still eating', but it will be a problem when aspectual 'still' appears in the scope of a modal construction, where we quantify over worlds. Since our goal is to have aspectual 'still' inside a counterfactual conditional, this is exactly the case that we are aiming for. Before presenting my proposed modification in order to make (221) world-dependent, let me discuss the second problematic point with (221).

**The event argument** Besides the issue that the universal quantification in the \*-operator removes world-dependence, there is a problem with how events relate to worlds. The starred version of the predicate 'John eat' requires that there is an event of John's eating in *every* world (see the second line in (223)). This does not correspond to the common idea that events are anchored to worlds. Suppose John eats at time  $t$  in worlds  $w_1, w_2, w_3$ , and does not do so in worlds  $w_4, w_5$ . Then only  $w_1, w_2, w_3$  contain an event of John's singing, and it makes no sense to talk about that event in every world, as the \*-operator would have us. An approach to events that is compatible with events being anchored to worlds is defended in detail in [Lewis \(1986\)](#):

An event is a localised matter of contingent fact. It occurs. It is contingent that it occurs; no event occurs at every possible world. (Lewis 1986: 243)

Lewis takes events to be properties of 'spatiotemporal regions'. So in each of  $w_1, w_2, w_3$  there is a spatiotemporal region (denoted  $s_1 < w_1, s_2 < w_2, s_3 < w_3$ ) in which a particular event  $e_1$  of

John's singing occurs, and it does not occur in any other region or world. As I will get rid of the \*-operator in order to remedy the loss of world-dependence of sentences with aspectual 'still', I will at the same time make sure that events are anchored to worlds. Before showing how, I will briefly discuss the role of the event argument of 'still' in (221).

Ippolito takes the event argument of aspectual 'still' to be a free variable, that does not get existentially bound. Ippolito's reason for this is that she assumes that 'still' always requires a contextually salient eventuality (e.g., in (221) a previous eating of John, referred to by  $e_1$ ), and cannot be uttered out of the blue. Greenberg (2009) argues against this and offers examples such as (225) (see her §4 for further discussion).

(225) The baby is still asleep. Please be quiet! (Greenberg 2009: 62)

This may be uttered to an addressee who didn't know that the baby was asleep, so didn't have a contextually salient event of the baby's sleeping. Greenberg (2009) therefore presents an account of aspectual 'still' in which the event variable is existentially bound, but is otherwise very similar to Ippolito's. I will maintain Ippolito's assumption that the event pronoun remains free, but in view of the Lewisian picture on events, I shall adopt a more sophisticated view of event pronouns. In addition to the technical problems with applying existential closure in (221) that Ippolito points out (2007: 10-11), I do not take Greenberg's data in (225) as particularly problematic, as out of the blue uses of aspectual 'still' may be explained by a general mechanism of accommodation.

**Two modifications** I will maintain the general structure of (221) but as explained above, I make two modifications. Instead of quantification over worlds, I take a simpler view that predicates have an event and a world argument (cf. e.g. Hacquard 2009): 'eat( $e, j, w$ )' means that  $e$  is an event of eating by John in world  $w$ . In that case, no \*-operator is needed, but we just can apply '-ing' to  $\lambda e.eat(e, j)$  directly.

When we make (221) world-dependent, we also have to say something about the event variable  $e_1$ . Ippolito does not discuss this in any detail, but since it refers to a contextually salient event, it can be seen as an *event pronoun* in the sense of Arregui (2007). An event pronoun, like



other pronouns, receives its interpretation via the assignment function  $g$  that assigns an event to it ( $\llbracket e_i \rrbracket^{g,w} = g(i)$ ). Arregui adopts Lewis's (1986) view of events as spatiotemporal regions alluded to above. She models events as functions on spatiotemporal regions:  $\llbracket e_i \rrbracket^{g,w}(s) = 1$  iff  $g(i)$  occurs in region  $s$  in  $w$ . In order to felicitously use an event pronoun in a world  $w$ , the event it refers to must have a spatiotemporal region in  $w$  in which it occurs. Arregui takes this to be a presupposition of the event pronoun:

(226) For an event pronoun  $e_i$ ,  $\llbracket e_i \rrbracket^{g,w}$  is defined only if  $\exists s(s < w \ \& \ \llbracket e_i \rrbracket^{g,w}(s) = 1)$ , where  $s$  ranges over spatiotemporal regions in worlds and  $<$  indicates a part-of relation.

(Arregui 2007: 239)

This presupposition (expressed here as a definedness condition) will become particularly relevant when 'still' occurs inside a modal context, where there is quantification over worlds. As for the sentence in (221), with the implementation of my two modifications, the derivation now goes as follows:

(227) *My derivation of 'John is still eating' (structure as in (221) with modifications)*

$\llbracket \text{John is still-}e_1 \text{ eating} \rrbracket^{g,w,t}$  is defined when

- (i)  $g(4) \circ t$  [presupposition of present tense]
- (ii)  $\exists s(s < w \ \wedge \ \llbracket e_1 \rrbracket^{g,w}(s) = 1)$  [presupposition of event pronoun]
- (iii)  $\exists t' < g(4)[t' \subseteq \text{time}(e_1) \ \wedge \ \text{eat}(e_1, j, w)]$  [presupposition of 'still']

When defined, the sentence is true if  $g(4) \subseteq \text{time}(e_1) \ \wedge \ \text{eat}(e_1, j, w)$ .

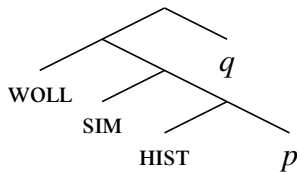
We can now proceed to see what happens when aspectual 'still' occurs inside a counterfactual conditional. However, our simplified semantics for counterfactuals given in section 1.1 is no longer sufficient. The semantics of 'still' makes crucial use of temporal properties of events, so we need a theory that is precise with respect to the aspectual and temporal interpretation of counterfactual conditionals. I will adopt Ippolito's (2006) theory for that purpose. I have already discussed the pragmatic aspects of that theory in section 5.2.3. Here I will discuss the formal semantic part of

the theory, focusing on the interpretation of tense. After the review (section 7.2.2), I pick up the narrative in section 7.2.3 and show how Ippolito’s (2006) semantics for subjunctive conditionals combines with her 2007 theory of aspectual ‘still’.

### 7.2.2 Review of Ippolito’s (2006) theory

Ippolito’s (2006) theory is a semantics of counterfactuals that takes the interpretation of tense as an essential part.<sup>83</sup> This feature will be useful for our purposes, as the behavior of ‘still’ in counterfactual conditionals is clearly related with the temporal interpretation of them. Ippolito proposes that counterfactual conditionals consist of a ‘bare’ conditional (as given in (228)) embedded under several modal and temporal operators. Ippolito adopts an approach in the style of Kratzer in which a conditional is a modal structure in which the antecedent restricts the modal operator. For counterfactual conditionals, the modal base is the set of historically accessible worlds (cf. Condoravdi’s  $\approx$ ; Ippolito denotes this HIST), and the ordering source is a similarity ordering on worlds (following Lewis 1973; Ippolito writes this as SIM).

(228) *Bare conditional*  $p \rightarrow q$  (Ippolito 2006)



The bare conditional ‘if  $p$ ,  $q$ ’ is true at a world  $w$  and a time  $t$  iff:  
 $\forall w' ([w' \approx_t w \wedge p(w') \wedge \neg \exists w'' [w'' \approx_t w \wedge p(w'') \wedge w'' <_w w']] \rightarrow q(w'))$

In order to get a better idea of the truth conditions in (228), the reader may find it helpful to consider Figure 5. This figure overlays a branching model for the future with Lewisian similarity spheres.<sup>84</sup>

<sup>83</sup>I will review the 2006 version of the theory. In Ippolito (2013b) she modifies some technical aspects of her 2006 account, but these don’t affect the claims I am making here.

<sup>84</sup>This should not be taken as to suggest that the  $\leq_w$  ordering depends on the temporal progression.  $w_5$  could be more similar to  $w_c$  than  $w_1$  is to  $w_c$ ; worlds and times are independent.

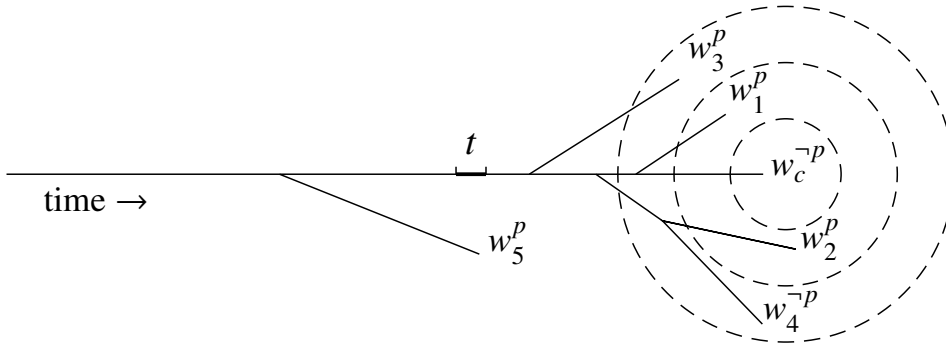


Figure 5. Branching future with Lewisian spheres

(229) The domain of quantification in (228) is the set of worlds that:

1. share the same history as  $w_c$  up to  $t$ : eliminate  $w_5$
2. are  $p$ -worlds: eliminate  $w_c, w_4$
3. are the most similar worlds to  $w_c$  with these properties: eliminate  $w_3$

(228) says that all those worlds are  $q$ -worlds.

The full representation of a counterfactual conditional is obtained by embedding the bare conditional inside temporal and aspectual operators as follows, where ‘[if  $p, q$ ]’ stands for the bare conditional from (228):

(230) One-past:       $\text{Pres}(\text{Perf}(\forall_{\subseteq}([\text{if } p, q])))$       (Ippolito 2006)

Two-past:       $\text{Past}(\text{Perf}(\forall_{\subseteq}([\text{if } p, q])))$

One of the key ingredients of Ippolito’s analysis, that enables her to derive several facts about the temporal properties and presupposition projection behavior of conditionals, is that the modal structure is embedded under a *universal perfect* (corresponding with the Perf operator in (230)). The universal perfect is one of several types of perfect that have been distinguished (see Iatridou et al. 2001) and expresses that an eventuality holds throughout an interval extending from a point in the past up to the time of utterance, as in sentences such as ‘I have been sick since 1990’. The interval of which the eventuality is asserted to hold (in this example [1990, now]) is called

‘Extended Now’ (XN) or the ‘Perfect Time Span’ (PTS; Iatridou et al. 2001). Besides the operator Perf, there is an aspectual operator  $\forall_{\subseteq}$  that quantifies over time intervals.

$$(231) \quad \text{Perf} = \lambda P_{\langle i,t \rangle} \lambda t_i \exists t' (\text{XN}(t', t) \wedge P(t') = 1) \quad (\text{Ippolito 2006})$$

$\text{XN}(t', t) \leftrightarrow t$  is the final subinterval of  $t'$

$\forall_{\subseteq} = \lambda P_{\langle i,t \rangle} \lambda t_i \forall t' (t' \subseteq t \rightarrow P(t'))$

Finally, there is a tense operator that binds the time variable of Perf: this has the effect of locating the perfect time span either as stretching up to the time of evaluation (operator Pres, in one-past counterfactuals), or stretching up to some time before the time of evaluation (operator Past, in two-past counterfactuals).

Combining (230) and (231) gives the following truth conditions for a two-past counterfactual conditional:

$$(232) \quad \llbracket \text{Past}_3(\text{Perf}(\forall_{\subseteq}(\text{WOLL}(\text{SIM}(\text{HIST}(p))))(q))) \rrbracket^{g, w_c, t_c} \text{ is defined iff } g(3) < t_c.$$

When defined, it is true iff  $\exists t (\text{XN}(t, g(3)) \wedge \forall t' \subseteq t (\forall w' (w' \simeq_{t'} w_c \wedge p(t') \wedge$

$\neg \exists w'' (w'' \simeq_{t'} w_c \wedge p(t') \wedge w'' <_{w_c} w')) \rightarrow q(t'))$ .

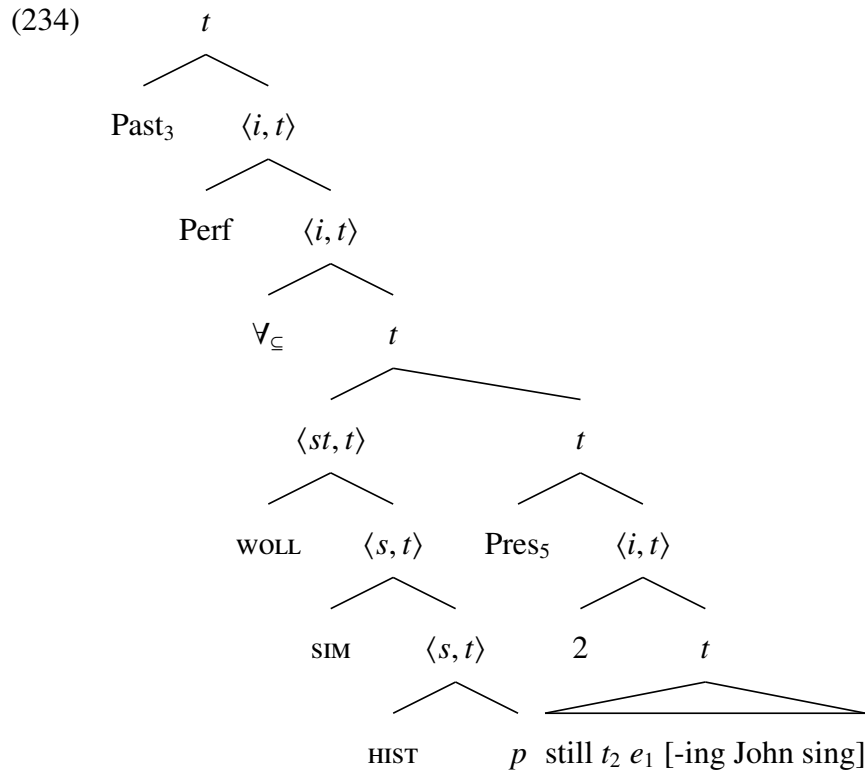
Thus, a two-past counterfactual conditional is true at  $t_c, w_c$  if the bare conditional ‘if  $p, q$ ’ is true at every time interval contained in the past perfect interval  $t$  that ends at  $g(3)$ .

### 7.2.3 Deriving aspectual consequent-internal ‘still’

Now, finally, we can compute the meaning of (217), repeated here.

$$(233) \quad [\text{John had been singing for an hour, but stopped when someone rang at the door.}]$$

If [John hadn’t heard the doorbell] $_p$ , he would still have been singing. (=(212))



A remark is in order about my assumption on the position of the present tense operator in (234) that binds the ‘still’ phrase,  $\text{Pres}_5$  (cf. the  $\text{Pres}$  operator in my example in (221)). Ippolito (2006) is mostly concerned with counterfactuals in which the evaluation time is in the future, such as ‘If John ran the marathon next spring, he would win’. To do this, Ippolito introduces one further temporal operator,  $\text{NP}_{\geq} = \lambda P.\exists t'(t' > t \wedge P(t') = 1)$  (NP for ‘non-past’). This operator applies both to the antecedent  $p$  and the consequent  $q$  so that the argument to  $\text{HIST}_{\langle\langle s,t \rangle, \langle s,t \rangle\rangle}$  is a truth value (which then combines with Intensional Functional Application).<sup>85</sup> It would thus have been possible to have the ‘[still  $t e_1$  [-ing John sing]]’ phrase function as the complement clause  $q$ , without abstracting over

<sup>85</sup>An issue may arise here with respect to the modal base, which in this case is the set of historically accessible worlds (HIST). Take the following example.

- (i) [context: John studied at a community college 20 years ago. He now doesn’t have a job.]  
If John had studied at Yale, he would have had a good job.

Here the evaluation time lies in the past, hence we assume that  $p$  and  $q$  are preceded by a past-tense operator. Now, in the bare conditional, all the worlds in the modal base, which consists of the historical alternatives up to  $t_c$ , agree on the truth value for  $p$  at time  $t' < t_c$ . That means the domain is either empty (when  $p(w_c, t') = 0$ ), or contains *all* historically accessible worlds (when  $p(w_c, t') = 1$ ), so the condition that the domain worlds should be  $p$ -worlds (number 2. in (229)) is non-restrictive. This raises the question whether conditionals with a present and past evaluation time should have different modal bases.

$t$ , since that phrase already denotes a truth value. That the structure in (234) gives the right result will be clear soon: the presence of  $\text{Pres}_5$  ensures that the hypothetical singing of John stretches up to *now*.

(235)  $\llbracket(234)\rrbracket^{c,g,t_c,w_c}$  is defined when:

1.  $g(3) < t_c$  [presupposition of  $\text{Past}_3$ ]
2.  $g(5) \circ t_c$  [presupposition of  $\text{Pres}_5$ ]
3.  $\exists t' < g(5). t' \subseteq \text{time}(e_1) \wedge \text{sing}(e_1, j, w_c)$  [presupposition of ‘still’]

When defined,  $\llbracket(234)\rrbracket^{c,g,t_c,w_c} = 1$  iff

$$\begin{aligned} & \exists t'' (\text{XN}(t'', g(3)) \wedge \forall t''' \subseteq t'' (\forall w' (w' \simeq_{t''} w_c \wedge p(t''') \wedge \\ & \quad \neg \exists w'' (w'' \simeq_{t''} w_c \wedge p(t''') \wedge w'' <_{w_c} w'))) \rightarrow (g(5) \subseteq \text{time}(e_1) \wedge \text{sing}(e_1, j, w'))). \end{aligned}$$

The truth conditions say that for any subinterval  $t'''$  of the perfect interval  $t''$ , in all worlds  $w'$  in the domain of quantification (as specified in (229)), John’s singing event  $e_1$  stretches to  $t_c$  in  $w'$ . We know that the event  $e_1$  exists in all worlds over which we quantify due to the presupposition of the event pronoun (see (226)). In other words, what aspectual ‘still’ does here, is require that in each of the worlds in the domain of quantification (worlds in which John heard the doorbell, share the same history as  $w_c$  up to  $t''$ , etc.), the contextually salient  $e_1$  has a spatiotemporal region stretching up from some  $t' < g(5)$  to  $t_c$ , i.e. the singing event continues in all those worlds, but not in the actual world. This correctly captures the meaning of (233).

**Interim summary** So far, I have only investigated consequent-internal ‘still’, i.e. the case in which ‘still’ is interpreted inside the consequent of a subjunctive conditional, and does *not* cancel  $\text{CF}_q$ . I showed how aspectual consequent-internal ‘still’ can be derived in example (233) (= (217) = (212)). Its meaning is correctly captured by a suitably modified existing theory of aspectual ‘still’ (Ippolito 2007) and a theory of counterfactual conditionals (Ippolito 2006). The

modifications I proposed had to do with world-dependency and the nature of events, but maintained the basic insight of Ippolito's event-based account that aspectual 'still' conveys the temporal continuation of an event.

This conclusion is thus parallel to the one I reached in section 3.3 for local 'also': local 'also' does not cancel  $CF_q$ , and can be accounted for by appealing to standard theories of additive particles and the semantics of counterfactual conditionals. I now turn to the puzzle about consequent-external 'still' as in (211), i.e. the cases in which 'still' forms a  $CF_q$ -cancellation context.

### 7.3 Consequent-external 'still'

I will argue that the type of 'still' we find in (211), repeated here, is interpreted outside the consequent in which it syntactically appears. Therefore I refer to it as **consequent-external 'still'**.

(236) A: If we'd come via Newbury, we would have made it.

B: If we'd taken the other road, we would **still** have been here in time.

I argued above that consequent-internal 'still' can – modulo some independent syntactic constraints – be any of the four types in (215). In the case of consequent-external 'still', we are dealing with a specific interpretation of 'still', and hence it constitutes a single type of 'still'. The question is whether it can be subsumed under any of the four labels in (215), or that none of these is suitable.

We can discount two types right away, leaving the two other types for further investigation. It is clear that we are not dealing with marginality 'still' in (236). The sentence does not contain a gradable adjective, nor can the meaning contribution of 'still' in these cases be said to involve the type of scalarity or degree ordering that is associated with such adjectives. Likewise, we are not dealing with exclusive 'still': in (236) 'still' does not have the meaning of an exclusive particle like 'only', but rather more the opposite of that: it adds two reasons of being on time.

That leaves aspectual 'still' and concessive 'still' as more viable candidates. I will first argue against the possibility that consequent-external 'still' is an instance of concessive 'still'. This option has some initial plausibility because typical examples of concessive 'still' appear inside the

consequent of conditionals, as in (215e), repeated here:

(237) Even if the doctor tells him not to, Harry will still run the marathon.

However, I will show that there are some important differences in meaning of conditionals like (237) when compared to (236). This will be taken up in section 7.3.1.

As for aspectual ‘still’, I argue that the behavior of ‘still’ is much more complex once we consider its interaction with modal contexts. I discuss this in section 7.4. I introduce two new sets of data involving ‘still’ occurring in a modal environment. I show that the special properties of consequent-external ‘still’ are shared by other cases in which ‘still’ outscopes a modal verb. This does not follow from the standard event-based analysis of ‘still’.

### 7.3.1 Concessive ‘still’ and semifactuals

It is tempting to analyze (236) as the fourth type in the list in (215), concessive ‘still’, in particular because many examples in which concessive ‘still’ occurs are conditionals. However, I will show that there is a crucial meaning difference between these concessive conditionals and conditionals of the sort in (236), making a parallel analysis untenable.

Recall that concessive ‘still’ expresses a concessive interpretation. In many languages there is a close relationship in form and meaning between concessive clauses (‘Although he studied all night, he still failed’) and concessive conditionals (‘Even if he had studied all night, he would still have failed’) (and there may be a diachronic relationship; see König 2010). Concessive conditionals often contain the scalar additive focus particle ‘even’ before the conditional ‘if’ (as in (237); therefore also known as ‘*even-if*-conditionals’), and are also known as *semifactuals* (Bennett 1982; Barker 1991; Byrne 2005; Guerzoni and Lim 2007 among many more; recall also my discussion in section 6.1).<sup>86</sup>

One defining characteristic of semifactuals is that there is no causal relation between the antecedent and the consequent (in example (237), the doctor’s advice has no influence on Harry’s

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<sup>86</sup>There is a lot of terminological variation: the labels ‘concessive conditional’, ‘*even-if*-conditional’, and ‘semifactual’ are used more or less interchangeably. I refer the reader to more empirically oriented work (Declerck and Reed 2001) for attempts to come to a more sophisticated classification.



decision to run the marathon; he will run the marathon *no matter what*). This is formulated by Barker (1991) as follows:

- (238) *Semifactual*  $p \rightarrow q$  (Barker 1991: 1)  
*q* is true and *p*, though bearing no connection to *q*, would not undermine (causally or otherwise) the fact that *q*.

Byrne (2005) writes that whereas regular counterfactuals emphasize a causal relation between antecedent and consequent, such a relation is absent or diminished in semifactuals:

[w]hen people imagine a semifactual alternative, the judgment that the antecedent caused the outcome may *decrease* [...] For example, the semifactual conditional “even if the airplane survivor had made it to the village he still would have died” emphasizes that not getting to the village was not a crucial factor (Byrne 2005: 133, italics in original)

There is extensive discussion in the literature on how the semifactual relationship (the lack of causality) is signaled: by the word ‘even’ alone (Bennett’s (1982) view), by ‘still’ alone (Barker’s (1991) view), or by a combination of both (Ippolito (2007: 3n) notes that (237) also has a concessive reading when only one of ‘even’ and ‘still’ is present). Besides distinguishing between these views, another important question asks how ‘even’, ‘still’, and ‘if’ compose semantically, but reviewing it falls outside the scope of this dissertation.

The important point for our purposes is that data such as (236) do not, in general, have a semifactual reading. For example, (236) does not express that we will be on time *no matter what*: for some routes we would be on time, but not for others. This conclusion is further supported by the observation that cases with consequent-external ‘still’ cannot be expressed as an *even-if*-conditional, which semifactuals (such as (237)), typically can. Let me illustrate by an example with my game show scenario (recall (40) on page 35; switching to this scenario has the advantage of making the causal relations explicit, and takes away potentially conflicting background assumptions regarding the likeliness of certain events, such as being on time, etc.).

- (239) a. [context: John picked Box A, and won \$100] [consequent-external]  
 If John had picked Box D, he would still have won \$100.
- b. Even if John had picked Box D, he would (still) have won \$100. [concessive]

Sentence (239b) is a somewhat odd utterance, because a semifactual statement suggests there is no causal relation between antecedent and consequent (see (238)). In this context, however, there is quite clearly a causal relation between picking a Box and winning a prize. When we insist that (239b) can nevertheless be interpreted in this semifactual sense, it conveys that John would win \$100 no matter what. This is false in the game show context, because Boxes C and E do not contain a \$100 prize. Compare this situation to sentence (239a). In that sentence we do not infer a lack of causality, and it expresses that opening Box D is an additional way to win \$100 besides opening Box A. This is true in the game show context. I thus conclude that  $CF_q$ -cancellation contexts with consequent-external ‘still’ are empirically distinct from semifactual conditionals with concessive ‘still’.

**Ippolito’s concessive ‘still’** I will conclude this section by briefly explaining Ippolito’s (2007) semantics for concessive ‘still’, and how it applies to conditionals. This will establish once more that this is not the right approach towards (236).

The formal semantics of concessive ‘still’ that Ippolito (2007: 26) proposes makes use of a likeliness ordering  $<_{\text{likely}}$  on sets of worlds. We will see that Ippolito makes use of this ordering to account for concessive ‘still’ both in non-conditional sentences (such as (215d)), and in semifactual conditionals.

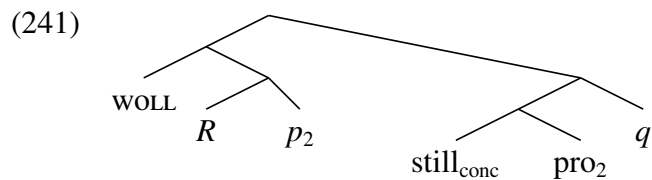
$$(240) \quad \llbracket \text{still}_{\text{conc}} \rrbracket^{c,g,w}(p)(q) \text{ is defined when } \max_{\leq, w_c} \{w : w \in p \wedge w \in q\} <_{\text{likely}} \max_{\leq, w_c} \{w' : w' \in \neg p \wedge w' \in q\}.$$

When defined,  $\llbracket \text{still}_{\text{conc}} \rrbracket^{c,g,w}(p)(q) = 1$  when  $q(w) = 1$ .

(where  $\max_{w, \leq}(p) = \{w' : p(w') \ \& \ \forall w'' [p(w'') \rightarrow w' \leq_w w'']\}$ )

What this says is that the best worlds in which  $p$  and  $q$  hold are less likely than the worlds in which not- $p$  and  $q$  hold. The concessive clause in (215d) is represented by having the propositions ‘John studied all night’ and ‘John failed the test’ be the  $p$  and  $q$  arguments of ‘still<sub>conc</sub>’, respectively. The resulting presupposition is that the best worlds in which John studied all night and failed the exam are less likely than the best worlds in which John did not study all night and failed the exam.

The structure for semifactual conditionals, if I interpret Ippolito’s brief description about this (2007: 27) correctly, is along the lines of (241), where the covert variable  $\text{pro}_2$  is co-indexed with the antecedent of the conditional. For simplicity, I only indicate the modal structure schematically using a single parameter  $R$ , and leave out temporal and aspectual operators (as in (13) in section 1.1).



In the case of (237), this gives the presupposition that the worlds in which the doctor tells Harry not to run the marathon and Harry runs the marathon are less likely than the worlds in which the doctor does not tell Harry not to run the marathon and Harry runs the marathon.

If this were applied to the case of (236), the presupposition would translate to “the worlds in which we take the other road and are on time are less likely than the worlds in which we do not take the other road and are on time”. This does not correctly capture the meaning of (236): what the speaker of (211) asserts is that taking either of two routes would have led to our being on time, but she makes no likelihood ordering between them.

## 7.4 ‘Still’ and modality

My approach toward analyzing consequent-external ‘still’ is to recognize the role the modal verb inside the conditional plays. I will derive the difference between consequent-internal and consequent-external ‘still’ as a difference of scope between ‘still’ and the modal verb.

First, I introduce two new sets of data that will help understand the interaction that ‘still’ has with modal verbs: ‘still’ in counterfactual readings of modals of the past (from Condoravdi 2002), and ‘still’ in modal subordination contexts. Then I compare these to consequent-external ‘still’ and discuss a number of problems that event-based theories of ‘still’ face when accounting for these data.

#### 7.4.1 Counterfactual readings of modals

An important observation is that ‘still’ behaves different in modal contexts than in non-modal contexts (e.g. Condoravdi 2002):

- (242) a. John is still eating.  
 b. \*John has still eaten.  
 c. John must still be singing.  
 d. (At that point in the race,) John could still have won.  
 e. \*John is still arriving on time.  
 f. (At that point), John may still have arrived on time.

In non-modal contexts, aspectual ‘still’ may combine with verbs with the progressive (-ing; (242a)), but not with perfective verb phrases (242b).<sup>87</sup> When there is a modal verb present, however, ‘still’ can combine with either (242c,d). Furthermore, non-modal ‘still’ cannot combine with non-durative events (242e),<sup>88</sup> but in modal contexts it can: (242f).

Examples (242d,f) are taken from Condoravdi (2002), in which ‘still’ helps to disambiguate one of two readings past modal verbs can have, namely a *counterfactual* reading. The meaning expressed by (242d) is that at some previous point in time it was possible for John to win, but this

<sup>87</sup>This follows from Ippolito’s theory of aspectual ‘still’. With a the Perfective operator  $\llbracket \text{Perf} \rrbracket^{c,g,w} = \lambda P_{\langle \ell, t \rangle} . \lambda e_{\ell} . \lambda t_i . (\text{time}(e) \subseteq t \wedge P(e) = 1)$  (Kratzer 1998: 107) in the AspP projection, the presupposition and assertion of ‘still<sub>aspectual</sub>’ require that there is a  $t' < t$  such that  $\text{time}(e) \subseteq t$  and  $\text{time}(e) \subseteq t'$ . These cannot be true at the same time: if the interval  $t'$  precedes the interval  $t$ ,  $\text{time}(e)$  cannot be contained in both of them.

<sup>88</sup>I put aside a coerced reading here, as in ‘John has been very punctual all his life, and he is still arriving on time everywhere’.

possibility is no longer active at the present. The modal is interpreted here as “backward-then-forward” shifting: at a previous time, there was a future possibility that John win the race. Because I have been using the term ‘counterfactual’ for conditionals, in order to avoid confusion I will refer to counterfactual readings of modals of the past as **CFMod** readings.

In Condoravdi’s account, the counterfactual reading of modals of the past arises as follows. In (243a) the modal ‘may’ is used with a perfective VP and in (243b) with a present tense VP. The modal base is metaphysical, which means it is a set of historical alternatives (as in Ippolito’s 2006 analysis discussed above).

- (243) a.  $\llbracket \text{John may have arrived on time} \rrbracket^{w,t} =$   
 $\exists t' < t. \exists w' (w' \simeq_{t'} w \ \& \ \text{arrive-on-time}(w')(e) \ \& \ \tau(e, w') \subseteq [t', \_])$
- b.  $\llbracket \text{John may arrive on time} \rrbracket^{w,t} =$   
 $\exists w' (w' \simeq_t w \ \& \ \text{arrive-on-time}(w')(e) \ \& \ \tau(e, w') \subseteq [t, \_])$

(Here  $\tau(e, w')$  is the “temporal trace” of event  $e$  in world  $w'$ , which I assume to be similar to Ippolito’s running time ‘time( $e$ )’). The perfect in (243a) contributes a back-shifting in time, so the quantification is over worlds in  $\{w' \mid w' \simeq_{t'} w\}$  with  $t' < t$ . If a world is a historical alternative to  $w$  at time  $t$ , it is also a historical alternative to  $w$  at  $t'$ , so  $\{w' \mid w' \simeq_t w\} \subseteq \{w' \mid w' \simeq_{t'} w\}$ . Hence, the speaker makes a statement in (243a) about a world in the larger set, thereby implying that it does not hold for a world in the smaller set. More precisely, the implicature is  $\neg \exists (w' \simeq_t w \ \& \ \exists e \dots)$ . This means that John did not arrive on time in the actual world.

Condoravdi suggests that the reason that ‘still’ can combine with a perfective VP in CFMod contexts is that, contrary to the surface order, the scopal order of tense, modal and ‘still’ is PERF > STILL > MODAL. Informally speaking, what ‘still’ applies to is not the having won, but the *possibility* of winning: this is exactly what it means for the modal to be in the scope of ‘still’. This idea of ‘still’ scoping over a modal verb is an interesting idea, and I will explore the technical consequences of it below. First, though, let me get to the main question for which I introduced the CFMod data: is ‘still’ in (242d) used in the same way as what I have been calling consequent-

external ‘still’ in subjunctive conditionals?<sup>89</sup>

An obvious difference between ‘still’ as it is used in modal sentences as in (242d), and my consequent-external ‘still’, relates to counterfactuality. The role of ‘still’ in CFMod readings is to disambiguate the counterfactual reading of modals of the past (from what Condoravdi calls the ‘epistemic reading’). What my consequent-external ‘still’ does, on the other hand, is *cancel* CF<sub>q</sub> (it forms a CF<sub>q</sub>-cancellation context, recall). However, we have to be careful about drawing such a conclusion too hastily. Condoravdi’s examples all contain a modal with existential force such as ‘may’ or ‘could’, while the modal in the subjunctive conditionals I have been considering is ‘would’.

Are CFMod readings possible with modals that have universal force? Condoravdi (2002: 75) claims that a counterfactual reading of modals for the past is only possible for modals in “subjunctive form [...] such as *might, would, should, ought to*”.<sup>90</sup> A constructed case with ‘would’ then looks as follows:

(244) At that point, John would still have won the race.

= at that point, it was still the case that ‘John will win the race’

According to some native speakers that I polled, this sentence is not counterfactual, in contrast to (242d). Some take the view that it is veridical ((244) implies that John did win the race), some that it is merely non-counterfactual (there is no inference to either the truth or falsity of the

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<sup>89</sup>A separate issue, not to be confused with the question I raise here about ‘still’, is the question whether Condoravdi’s (2002) explanation for the counterfactual reading of modals of the past, can extend to an explanation for the counterfactuality of two-past subjunctive conditionals (in which, after all, a modal combines with a perfect VP). Condoravdi herself is not concerned with this extension of her theory (although she briefly mentions conditionals in a later manuscript, Condoravdi 2003). Ippolito (2006), however, argues that Condoravdi’s theory cannot account for counterfactuality in conditionals. She states her objection as follows:

since the antecedent acts as the restriction of *might* and the worlds in the modal base must be identical to the actual world up to and including the speech time, it follows that the proposition expressed by the antecedent clause cannot be counterfactual, since there cannot be counterfactual worlds in the modal base  
(Ippolito 2006: 642)

To the contrary, Abusch (2012) suggests that there is a “logical link” (p. 281n) between counterfactual modality and counterfactual conditionals, but she does not argue for this position in detail.

<sup>90</sup>Here, Condoravdi assumes ‘would’ is a metaphysical necessity modal that does not involve graded modality (i.e. does not need an ordering source). The reader should thus keep in mind that the discussion of (244) assumes a metaphysical reading.

complement). However, the counterfactual status of sentences with back-shifting ‘would’ appears to depend on contextual factors. The following example and context are due to Lauren Winans (p.c.).

(245) [context: *I have been offered a job. The next day the job offer is changed so that I have to work more hours. On day 3 the offer is changed again so that I get less pay. On day 4 the offer is changed again.*]

On day 2, I would still have accepted the job.

implicature: I didn’t accept the job

Here a counterfactual reading is much stronger.

If we follow Condoravdi’s explanation for the counterfactuality in (243) discussed above, we might have an explanation for this weaker or context-dependent form of counterfactuality. The explanation is the same, except that the modal force is universal instead of existential. Thus, the speaker makes a claim of the form  $\forall w'(w' \simeq_r w \dots)$ , and the implicature is  $\neg \forall w'(w' \simeq_t w \dots)$ . That is, the implicature is a negative universal statement, which is much weaker than a negative existential statement as in the implicature of (243a) above: in particular, it does not entail that  $p$  is false in the actual world, although it is compatible with it.

The above discussion about ‘would’ gives reason to weaken somewhat our previous conclusion that ‘still’ as used to enforce CFMod readings, and  $CF_q$ -cancelling consequent-external ‘still’ are completely distinct with respect to counterfactuality. Yet, it is still true that at least some cases of CFMod sentences with ‘would’ are counterfactual, and thus the two can not be identified. Below we will see that there are more similarities between consequent-external ‘still’ and ‘still’ in modal subordination contexts. Before turning to that, however, it is instructive to see how Ippolito’s account for aspectual ‘still’ (as discussed in section 7.2.1) can handle Condoravdi’s data (to repeat, this is not the approach I propose for consequent-external ‘still’, but the technical discussion below will be relevant in upcoming discussion in section 7.4.2).

**Technical issues about modal events** Condoravdi is not as explicit about ‘still’ as Ippolito is. They both agree that ‘still’ only makes a presuppositional contribution, and its truth-conditional content is trivial. Condoravdi does not formally spell this out, but instead gives the following description: “[aspectual] ‘still’ presuppose[s] the existence of a prior state and the possibility of [...] a state transition from a positive phase to a negative phase” (Condoravdi 2002: 81). As support for the required scoping STILL > MODAL, Condoravdi explains that the presupposition of ‘still’ implies for (242d) that “the possibility of his winning has been a live option and that eventually it may cease to be”, which “is consistent with possibilities decreasing over time” (p. 82).

Observe that this use of ‘still’ in (242d) is similar in some important respects to Ippolito’s aspectual ‘still’. We can think of the presupposition of ‘still’ as requiring that the possibility of winning existed at a previous time, and the same possibility is asserted to be active at the reference time (i.e. ‘at that point in the race’). Because Iatridou’s theory of ‘still’ is technically more precise than Condoravdi’s, we would like to combine Ippolito’s framework with Condoravdi’s insights on the interaction of ‘still’ with modals. Note, however, that Ippolito’s account is what I called an event-based account (aspectual ‘still’ takes an eventualized AspP of type  $\langle \ell, \langle i, t \rangle \rangle$  as argument; section 7.2.1). This means that in order to apply Ippolito’s account to a situation in which ‘still’ scopes over a modal (STILL > MODAL), we must be able to talk about a modality (such as the possibility of John winning) *as an event*. This introduces some technical as well as conceptual questions.

A technically simple option is to force modals to be properties of events by applying the following operator to them:<sup>91</sup>

$$(246) \quad \llbracket \circ P_{\langle i, t \rangle} \rrbracket^w = \lambda e_{\ell}. (\llbracket P \rrbracket^w(\text{time}(e)) = 1)$$

This is my modified variant of Ippolito’s (2007) \*-operator (see (223) above) that takes away some of the problems identified with the quantification over worlds in the original \*-operator. In that

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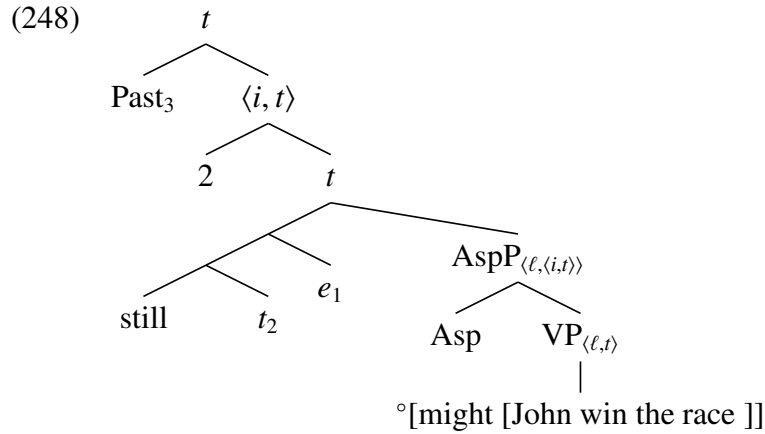
<sup>91</sup>Also, we need an aspectual operator in the place of  $\llbracket \text{-ing} \rrbracket$  (see (222)) to turn the VP into something of type  $\langle \ell, \langle i, t \rangle \rangle$ . In (249) below, I use  $\llbracket \text{Asp} \rrbracket^{c,s,w} = \lambda P_{\langle \ell, t \rangle} \lambda e_{\ell} \lambda t_i. (t \circ \text{time}(e) \wedge P(e) = 1)$ .



case, using Condoravdi's (2002) entry for 'might', we get the following result:

$$(247) \quad \llbracket \circ[\text{might} [\text{John win}]] \rrbracket^w = \\ \lambda e_\ell. (\exists w' (w \simeq_{\text{time}(e)} w' \wedge \exists e' (\text{win}(J, w', e') \& \text{time}(e') \subseteq [\text{time}(e), \_])))$$

The derivation of (242d) then proceeds as follows:



(249)  $\llbracket (248) \rrbracket^{c,g,w}$  is defined when:

- i.  $g(3) < t_c$
- ii.  $\exists t' [t' < g(3) \wedge t' \circ \text{time}(e_1) \wedge \exists w' (w \simeq_{\text{time}(e_1)} w' \wedge \exists e' (\text{win-race}(J, e', w') \wedge \text{time}(e') \subseteq [\text{time}(e_1), \_]))]$ .

When defined,  $\llbracket (248) \rrbracket^{c,g,w} = 1$  when:

$$g(3) \circ \text{time}(e_1) \wedge \exists w' (w \simeq_{\text{time}(e_1)} w' \wedge \exists e' (\text{win-race}(J, e', w') \wedge \text{time}(e') \subseteq [\text{time}(e_1), \_])).$$

This says that in the past interval  $[t', g(3)]$ , there must be a historical alternative to the actual world in which John wins the race. Since  $g(3) < t_c$ , this is compatible with a (weakly) counterfactual reading (see Condoravdi's explanation above).

This demonstration that Ippolito’s aspectual ‘still’ can in principle apply to modal events will be useful in the later discussion. Of course, one may object against the unconstrained use of the  $\circ$ -operator to modal statements. I will leave the (philosophical) question to what extent modal statements can be treated as a type of eventuality aside. Instead, I will conclude this discussion by mentioning one place where this issue of modals and events has come up in the linguistic literature. [Hacquard \(2009: 292-293\)](#) (building on a lot of other work) argues that whether or not a modal statement is a property of events depends on the structural position of the modal: epistemic modals are syntactically higher in the structure (above tense) and combine with a proposition (type  $\langle s, t \rangle$ ), while circumstantial modals are lower in the structure and are properties of events. For example, she has the following entry for circumstantial ‘can’ (p. 293), which is similar to what my  $\circ$ -operator would yield (although Hacquard here does not include time parameters).

$$(250) \quad \llbracket \text{can}_{\text{circ}} \rrbracket^w = \lambda P_{\langle s, \langle \ell, t \rangle \rangle} \lambda e_{\ell}. \exists w' \text{ compatible with circumstances in } w \text{ s.t. } P(w')(e)$$

I will not review the evidence for such a position here. It is clear that some work needs to be done to reconcile the syntactic view of modals with my data with ‘still’ and subjunctive conditionals. Subjunctive conditionals are often taken to involve metaphysical modality (cf. my discussion of [Ippolito \(2006\)](#) in section 7.2.2), which does not involve a circumstantial modal base, and hence according to Hacquard would not take a property of events. On the other hand, in recent work [Abusch \(2012\)](#) shows that at least in some cases, counterfactuals can have circumstantial modals. I leave the difficult task of combining the pieces of evidence from these different sources into a coherent framework to future research.

#### 7.4.2 Modal subordination

Counterfactual readings of modal sentences like (242d) are not the only ones in which ‘still’ co-occurs with a modal of the past. The combination also typically occurs in **modal subordination** contexts. Modal subordination is the widely studied phenomenon in which the interpretation of a modal expression is relative to that of a preceding modal expression ([Roberts 1989](#); [Kibble 1994](#);

Geurts 1999; Kadmon 2001; van Rooij 2005; Asher and McCready 2007 and many more). The particular interest in this phenomenon comes from cases in which pronouns and presuppositions are bound from one modal context to the other. A classic example is (251) in which the indefinite ‘a wolf’ introduced in a modal context can serve as the antecedent for pronouns in subsequent expressions as long as they are non-factual (as in (251a), but not in (251b)).

(251) A wolf might come in.

a. ... It would eat you.

b. \*... It eats you.

To my knowledge, the specific behavior of ‘still’ in modal subordination contexts, as exemplified in (252) below, has not been discussed before.

(252) [context: we know that John went to a party and that he was planning to sing and dance there]

A<sub>1</sub>: John may have had an accident on his way to the party.

B: Then he wouldn’t have been able to dance at the party.

A<sub>2</sub>: But he would **still** have sung.

My goal is to first describe at an informal level what the contribution of ‘still’ in these contexts is. I will compare (252) to another case of ‘still’ in modal subordination contexts. I then argue that my consequent-external ‘still’ has more in common with ‘still’ appearing in modal subordination contexts, than with ‘still’ in CFMod readings as discussed in the previous section. Hence, a parallel analysis of the modal subordination data with consequent-external ‘still’ in subjunctives is called for.

**Description of the data** What is, intuitively speaking, the presupposition of ‘still’ in (252)? It seems to presuppose that in the *actual world* it was true at some past time that ‘John will sing’: this is established in the context for (252). This intuition is further supported by the observation

that if it is known that John was never going to sing at the party (i.e. if there is no salient event of singing at all), (252) is infelicitous. When we turn to the assertion of ‘still’, we note that it conveys that ‘John will sing’ in the *modally subordinated worlds* (the ‘accident worlds’). The remarkable observation is thus that the presupposition of ‘still’ in (252) concerns the world of evaluation, but the assertion relates to singing events in the modal worlds.

Now compare this to another case of modal subordination with ‘still’:

(253) [context: we know that John went to a party and that he wasn’t planning to sing at the party. John has a crush on Mary, who is a great lover of opera.]

A<sub>1</sub>: John may have met Mary at the party.

B: Then he certainly would have started singing at 8pm to impress her.

A<sub>2</sub>: And he would **still** {have been singing / \*have sung} at 10pm.

In this case the presupposed event of singing is made available within the modally subordinated worlds (in B’s utterance), and in the actual world it is not true at some past time that ‘John will sing’. In other words, the presupposition and assertion of ‘still’ in (253) relate to an event in the *same* world, while in (252) they relate to *different* (sets of) worlds.

I assume that in (252), the scoping is PERF > STILL > WOLL. This is the same scoping as for Condoravdi’s CFMod cases, and explains why ‘still’ can co-occur with a perfect VP there. In (253) I assume the scoping is WOLL > PERF > STILL. The reason that the modal has wider scope than ‘still’ has to do with the meaning of (253): ‘still’ is understood to be inside the scope of the modal verb, as in simpler cases such as *John may still be smoking*, which has the meaning ‘◇[John is still<sub>aspectual</sub> smoking]’, i.e. MODAL > STILL. The reason that the modal outscopes PERF follows from Condoravdi’s (2002) proposal for modals of the past. According to Condoravdi, modals take aspectual operators (but not tense operators) in their scope, which in this case causes the backshifting effect (we are talking about a past party rather than a present/future party in (253), hence all the modals are modals of the past). This explains why we have to use the progressive in (253-A<sub>2</sub>): ‘still’ is not in the scope of a modal, and is thus subject to the normal aspectual

restrictions (see (242)).

The contrast between (252) and (253) is reminiscent of the general case of presupposition projection. In section 3.3.1 I discussed how the presupposition projection behavior of an additive particle inside the consequent of a conditional depends on the location of its presupposed alternative (inside the the antecedent of the conditional, or outside the conditional). A similar issue arises in this case: is the presupposition of ‘still’ satisfied inside the modally subordinated worlds (as in (253)), or outside of it (as in (252))?<sup>92</sup> It has indeed been proposed that the presupposition projection problem does not just apply to the classic cases of conditionals and conjunctions (i.e. situations of the form  $\varphi \rightarrow \psi_\pi$  and  $\varphi \wedge \psi_\pi$ ), but also to the phenomenon of modal subordination (Geurts 1999; Kadmon 2001).

**Modal subordination compared to CFMod** How do the modal subordination cases presented in this subsection differ from the CFMod cases from the previous subsection when it comes to the behavior of ‘still’? Above I have already mentioned one aspect in which they are similar. When ‘still’ is used as in (252) (but not in (253)) the scopal order of ‘still’, modal, and perfect aspect is the same as in the CFMod cases.

A potential difference with CFMod readings relates to their counterfactual nature. Discourse (252) is perfectly acceptable if we know that John did actually sing: (252) just provides hypothetical reasoning on what would have happened in case of an accident (we may replace A’s first utterance by ‘Imagine that John had an accident. . . ’). CFMod sentences, on the other hand, are counterfactual to some extent. CFMod sentences with ‘could’, such as Condoravdi’s (242d), are predicted to always be counterfactual, while I showed that CFMod sentences with the modal ‘would’ can, but not always need to be, counterfactual (recall examples (244) and (245)).

Finally, there is also a clear difference between CFMod readings and modal subordination

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<sup>92</sup>For further parallels, compare the classic case in (251) to (i.a), in which the pronoun takes an antecedent that is not modally subordinated. Example (i.b) makes the same point for the presupposition trigger ‘stop’:

- (i) a. There is a wolf in that cage. It may break loose. It would eat you.
- b. John is a smoker. He may read a book on the health effects of smoking. Then he would stop.

contexts of the type in (252). In my derivation of (242d) in (248/249), I showed that the CFMod reading involves the continuation of a possibility event in *a single world*. The reader can verify this in (249): the possibility of winning is computed with respect to the world of evaluation in both the presupposition and in the assertion. With ‘still’ in the modal subordination context in (252), as I pointed out above, this is different: there, the presupposition and the assertion relate to events in different (sets of) worlds. For convenience, let me refer to this difference as a *stable-world* interpretation and a *cross-world* interpretation, respectively.

We can then classify the different cases of ‘still’ in modal contexts by using two parameters: the scope relation between the modal and ‘still’, and the stable-world/cross-world property.

Use of ‘still’	Scope	World property
consequent-internal ‘still’ (e.g. (212))	MODAL > STILL	stable-world
‘still’ in modal subordination contexts (type of (253))	MODAL > STILL	stable-world
consequent-external ‘still’ (e.g. (236))	STILL > MODAL	cross-world
‘still’ in CFMod readings (e.g. (242d))	STILL > MODAL	stable-world
‘still’ in modal subordination contexts (type of (252))	STILL > MODAL	cross-world

Table 4. ‘Still’ in modal contexts

Consequent-internal ‘still’ has the stable-world property because it is part of the proposition of the consequent (in (212), the continuation of singing is considered in each world separately, as I derived in section 7.2.3). Consequent-external ‘still’ has the cross-world property because, to use the example in (236), its presupposition is about being on time because of taking one road, and the assertion is about being on time about another world.

On the basis of the two parameters in Table 4, we see that the consequent-internal/consequent-external distinction, which we are ultimately interested in accounting for, is parallel to the distinction between the two cases of modal subordination in (252) and (253). This should not come as a big surprise, since the similarities between modal subordination and conditionals are well known. As Asher and McCready (2007: 96) write: “modals combine productively together with a conditional whose antecedent is adjusted for the appropriate mood to create counterfactuals (and

non-counterfactual conditionals) of various kinds”. Asher and McCready go on to develop a combined analysis for modal subordination and counterfactual conditionals. The idea to represent the meaning of modal subordination contexts by means of conditionals is older than this. Here is an example with modal subordination set up by negation (cf. Geurts 1999: 188).

- (254) John doesn't have a car. It would be in the garage. (Kadmon 2001: 166)  
↳ If John had a car, it would be in the garage

One thing that we sought to explain about consequent-external 'still' is that its meaning is close to that of the additive particle 'also' (recall (214)). I believe that the cross-world property that consequent-external 'still' shares with (252) gives some insight into this. When the presupposition and assertion of 'still' involve events in different worlds, they are perceived as distinct, and one event can serve as a focus alternative for 'also'. To illustrate, I have used 'also' instead of 'still' in a context similar to (252) below:

- (255) [context: John went to a party and he sang there]

A: John may have had an accident on his way to the party.

B: In that case he would **also** have sung.

(explanation: the actual singing and the singing-if-he-had-an-accident are distinct enough to count as distinct alternatives for 'also')

However, in a context like (253) we cannot freely replace 'still' with 'also':

- (256) [context: John went to a party and sang for an hour until 9pm]

A: If John hadn't had so many drinks, he would have sung longer.

B: Yes, he would {still/#also} have been singing by 10pm.

(explanation: the actual singing, and the prolonged singing-if-he-had-not-drunk are not distinct enough to count as distinct alternatives for 'also')

These explanations are of course informal, and are meant to just illustrate how my modal classification in Table 4, and the cross-world property, can provide an insight into some of the difficult questions about consequent-external ‘still’. The discourses in (255) and (256) are not precise copies of (252) and (253): there is no exact identity in meaning between ‘also’ and ‘still’ in (252). There are several external factors that come into play here, including very subtle ones (as I found in the experiments I conducted, see Appendix A).

If this idea about cross-world ‘still’ can be made more precise, it will also provide an explanation of why consequent-external ‘still’ constitutes a  $CF_q$ -cancellation context. Because the two events in a cross-world interpretation are distinct they can instantiate different causes, and hence make up a multiple cause context. Consider again the example of consequent-external ‘still’ in (236), repeated below:

(257) A: If we’d come via Newbury, we would have made it.

B: If we’d taken the other road, we would **still** have been here in time.

Here the presupposition of ‘still’ involves the event of being on time because we came via Newbury, and the assertion involves the event of being on time because of taking the other road. Hence, it constitutes a multiple cause context. Such a situation could not occur for consequent-internal ‘still’: these have the stable-world property, and (in the case of aspectual ‘still’) merely convey the temporal continuation of some event (e.g. John’s singing) within a world. The now familiar explanation for  $CF_q$ -cancellation applies: via Karttunen’s schema, we predict that  $CF_q$  is not generated in the data with consequent-external ‘still’ as they form multiple cause contexts (which do not have conditional perfection; chapter 6). For consequent-internal ‘still’ there is no link with multiple cause contexts, and hence  $CF_q$  is generated in the normal fashion.

I will conclude by presenting some thoughts on how we might analyze consequent-external ‘still’ more formally.

**Towards an analysis of consequent-external ‘still’** Of the five uses of ‘still’ in Table 4, the three with the stable-world interpretation can be accounted for. For consequent-internal ‘still’ I showed



this in section 7.2. For ‘still’ in CFMod readings, I showed that it is technically straightforward to derive the right meaning in section 7.4.1: by assuming that a modality, such as a possibility of winning, can be an event, my version of Ippolito’s (2007) analysis of aspectual ‘still’ applies to it. I have not gone through a derivation for ‘still’ in modal subordination cases like (253), but I hope that it is clear on the basis of the two earlier examples that my world-dependent semantics for aspectual ‘still’ can handle such cases. For (253), the proposition ‘John is still singing’ is embedded under the modal of the past ‘would have’, which is quite similar to consequent-internal ‘still’. A precise demonstration of this depends on the specific implementation of modal subordination.<sup>93</sup>

The cross-world property is clearly causing some problems for an event-based analysis of aspectual ‘still’. It is not clear how we can speak of a temporal continuation of an event in consequent-external ‘still’ or in (252), when the event ‘crosses worlds’. There are two options to take from here. The first option is to say that this problem is sufficiently severe to reject an event-based analysis of ‘still’ as a feasible approach to analyzing consequent-external ‘still’ and ‘still’ in the cross-world modal subordination contexts. The second option is to attempt to maintain an event-based analysis by having a closer look at the nature of events. Let me entertain this second option first.

The problem of events ‘crossing worlds’ is reminiscent of a proposal made in Hacquard (2009),<sup>94</sup> who analyzes the implicative effect of sentences with past modals. In her analysis a sentence such as *Jane was able to run* asserts, informally speaking, that “[t]here is an event *e* in the actual world located in a past interval, and there is a world compatible with the circumstances in the actual world where *e* is a run by Jane” (Hacquard 2009: 297). In order to make precise what it means for an event *e* to exist both in the actual world and in a distinct world in the modal base, she introduces the principle of Preservation of Event Description:

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<sup>93</sup>There are several such formal implementations. To mention just a few, it has been proposed that modal subordination is possible because modal bases can be picked up anaphorically (Kibble 1994), that modal subordination is a type of presupposition projection because modals presuppose their domains (Geurts 1999), that modal subordination is related to how presuppositions are verified dynamically (van Rooij 2005), and that modal subordination is possible because sets of possibilities are updated dynamically (Asher and McCready 2007). See also van Rooij (2005: §3.1) for an overview.

<sup>94</sup>Thanks to Yael Sharvit (p.c.) for bringing this connection to my attention.

(258) *Preservation of Event Description* (PED)

(Hacquard 2009: 298)

for all worlds  $w_1, w_2$ , if  $e_1$  occurs in  $w_1$  and in  $w_2$ , and  $e_1$  is a  $P$ -event in  $w_1$ , then *ceteris paribus*,  $e_1$  is a  $P$ -event in  $w_2$  as well

When one takes a Lewisian view on events, as I did in section 7.2.1, such a principle should hold naturally. Remember that according to that view, an event is a spatiotemporal region of worlds. Jane's running event  $e_1$  can thus have regions in both  $w_1$  and  $w_2$ . Hacquard's PED also appears to be stricter than a Lewisian (1986) view on events. For example, one of the properties of events that Hacquard (2009) takes to be stable across worlds is their running time (p. 298). But this is clearly not required for Lewis: if an event has spatiotemporal regions  $s_1 < w_1$  and  $s_2 < w_2$ ,  $s_1$  and  $s_2$  need not be of the same length. More importantly, Hacquard's restriction on running length is also too strict for the data I am considering. In the modal subordination case in (252), John's singing time in the actual world need not be identical to the singing time in the modal base set up by 'may'. According to Hacquard (2009: 298), PED can only be violated in special circumstances marked by morphological realization of counterfactuality, but I concluded earlier that the case of modal subordination *differs* from counterfactual readings of modals.

Another response is to say that the reason that we do not get the intuition of temporal continuation of singing in (252), is that what 'still' applies to is not the proposition that John sings, but the modal statement 'would John sing'. This is because 'still' takes scope over the modal (see Table 4). Recall that this also happens in the CFMod data, and I showed how they can be analyzed as the continuation of a 'possible  $p$ ' event (section 7.4.1). The idea, then, is that the cross-world interpretation of (252) (and, by analogy, of consequent-external 'still') is caused by the fact that we are dealing with the continuation of a 'WOLL  $p$ ' event, and the modal WOLL has the effect of switching to different worlds. Although a 'WOLL  $p$ ' event can easily be defined technically, I personally find it much harder to understand what it means to be an event of metaphysical modality (such as WOLL appearing in counterfactual conditionals), than to be an event based on the possibility of winning, as we had in (242d). Moreover, since this proposal effectively amounts to a parallel analysis between 'still' in CFMod cases and modal subordination cases (modulo the type

of modal verb), it is hard to explain the differences that exist between them, as discussed above.

The other option to deal with the problem of events and a cross-world interpretation is to reject an event-based account of ‘still’ altogether. In that case we might want to have an analysis along the lines of [Condoravdi’s \(2002\)](#) suggestion that ‘still’ presupposes a state transition (see my page 178 for some brief discussion). This is closer in spirit to older analyses by [Löbner \(1989\)](#) and [Krifka \(2000\)](#), which likewise involve a type of state transition, but also are both focus-based analyses of ‘still’. As far as I can see these suffer from the same problem of a lack of world-dependence as [Ippolito’s \(2007\)](#) original proposal (see my section 7.2.1). As a result, we will not be able to explain the scope interaction between ‘still’ and the modal verb directly. I leave the question of how these accounts can be improved on in order to account for the various properties of cross-world interpretations of ‘still’ that I have discussed in this chapter to future research.

## 8 Conclusion

I will conclude by making some remarks on the phenomenon of counterfactuality in general. My investigation of counterfactuality is distinct from a lot of earlier work in two different aspects. First, it focuses on the counterfactuality of the consequent (written  $CF_q$ ) rather than that of the antecedent ( $CF_p$ ). Second, it focuses on the role discourse plays in deriving counterfactual inferences, rather than on the role the morphological ingredients of the conditional play. Taking this approach has both empirical and theoretical consequences.

The empirical consequence is that cases in which  $CF_q$  gets cancelled (so-called *CF<sub>q</sub>-cancellation contexts*) become the key data under investigation. This makes the empirical picture much richer than that for contexts that cancel  $CF_p$ . Recall from chapter 1 the widely made observation that  $CF_p$  can be cancelled in so-called ‘Anderson contexts’ such as (20), repeated here:

(259) If Jones had taken arsenic, he would have shown just exactly those symptoms which he does in fact show. [So, it is likely that he took arsenic].

Although this is a valid example, it is fair to say that this is a somewhat special construction (the actual symptoms are equated to symptoms in some other possible world) that does not occur very often in natural discourse. I am not aware of systematic discussions of additional types of  $CF_p$ -cancellation. The situation for  $CF_q$  is totally different. I have identified various  $CF_q$ -cancellation contexts in chapter 2. These were not merely variations of a single construction, but rather belong to different classes: conditionals with non-local ‘also’ in their consequent, conditionals with consequent-external ‘still’, and conditionals featuring intonation contours that mark them as answers to a question under discussion asking for different causes for the same consequent. Moreover, these  $CF_q$ -cancellation contexts are more natural than the one in (259) for  $CF_p$ . This is shown by the fact that I found several examples in corpora (see Appendix A).

The theoretical consequences of focusing on  $CF_q$  and discourse are that I found a number of new theoretical connections between counterfactuality and other linguistic phenomena. For example, I discussed the interaction of counterfactuality with **focus**. The location of the focus associate

of ‘also’ in the consequent of a subjunctive conditional determines whether  $CF_q$  is generated or not generated (chapter 3). In chapter 4, it was shown that this type of focus-sensitivity is a specific instance of a link between counterfactuality and **causal structure**: when focus alternatives are generated for a constituent inside the antecedent, these alternatives function as separate causes for the same consequent. I called contexts in which more than one cause for the same consequent is salient *multiple cause contexts*. The empirical generalization is that all the  $CF_q$ -cancellation contexts found in chapter 2 are multiple cause contexts.

The bridge between causal structure and counterfactuality is given by **conditional perfection**. Following an idea by Karttunen (1971), conditional perfection is a necessary ingredient for  $CF_q$  to arise (chapter 5). In chapter 6, I worked out the various predictions made by Karttunen’s account, namely that in any case in which no conditional perfection happens,  $CF_q$  gets cancelled. In particular I showed that multiple cause contexts are contexts that do not have conditional perfection. This gave rise to the final theoretical connection, namely the one between counterfactuality and the **question-answer structure** of discourse. Because conditional perfection can be analyzed as exhaustification of a conditional answer, results from the area of exhaustive answers can be applied directly to the area of counterfactual inferences. This may be seen as one of the main theoretical results of this dissertation: I have shown how a non-literal and highly context-sensitive aspect of meaning can be studied by using tools developed in the area of the question-answer structure of discourse, an area that at first sight has nothing to do with counterfactual inferences.

By combining the empirical and theoretical consequences outlined above, I can return to a higher-level claim I made in chapter 1. The claim was that the counterfactuality of the antecedent and that of the consequent are two distinct phenomena. The distinction between  $CF_p$  and  $CF_q$  can be seen at a number of different levels. First, on an empirical level, we have seen that  $CF_q$  can be cancelled independently of  $CF_p$ , and that moreover the sets of  $CF_p$ -cancellation contexts and  $CF_q$ -cancellation contexts are very distinct in nature. Second,  $CF_p$  and  $CF_q$  have a different status in my theoretical account. I explain the generation of  $CF_p$  and  $CF_q$  in very different ways: in chapter 5 I argued that  $CF_q$  cannot be given a theoretical explanation parallel to that of  $CF_p$  (what I called

a ‘type A-account’ of  $CF_q$ ). Instead, I adopted Karttunen’s (1971) idea that conditional perfection plays a crucial role in generation  $CF_q$ , but not in  $CF_p$ .

Finally, the role discourse plays in the generation of  $CF_p$  and  $CF_q$  is very different. In chapter 1 we saw some restrictions on  $CF_p$ -cancellation in Anderson-conditionals as in (259). These restrictions related to the context in which a sentence like (259) appears ((22) on page 16), and to the tense morphology of the conditional in question (Ippolito’s generalization, (23) on page 16). The role of discourse in the cancellation of  $CF_q$  is of course much more dramatic than these two restrictions for  $CF_p$ : as outlined above, both the causal structure and the question-answer structure of the discourse play a role in generating  $CF_q$ .

**Future work** Let me finish by sketching a few ways how the research of the current dissertation can be extended in future work.

#### *Experimental work*

I think this project has a lot of potential for further experimental work. In addition to the remarks I make in appendix A.3, here are some further ideas for experimental work.

In this dissertation I have mostly been concerned with the theoretical argumentation behind the proposal that  $CF_q$  is cancelled in multiple cause contexts. This included both argumentation of what linguistic cues may signal a multiple cause context (such as the presence of ‘also’, certain other intonations, or the right discourse structure), as arguing that multiple cause contexts do not have conditional perfection. An important aspect that I have left aside is how speakers actually recognize multiple cause contexts in discourse. Here, I see an important role for experimental work: investigate how speakers recognize causal structure in discourse, and how it affects their tendency to derive pragmatic inferences. Such work addresses a general pragmatic problem: how do speakers use their representation of the discourse to draw pragmatic inferences?

For example, in all cases discussed in this dissertation, there was *some* linguistic cue signaling a multiple cause context, e.g. the word ‘also’ or ‘still’ or an intonation pattern matching with

a question under discussion that asks for multiple causes. I hypothesize that when there are no such linguistic cues, and it is *just* the context by itself that suggests multiple causation, the lack of conditional perfection and  $CF_q$ -cancellation will be much less strong. A possible experimental paradigm that could test for this involves presenting participants with a discourse and asking them some questions querying their willingness to draw pragmatic inferences. Examples of such questions are ‘How likely do you think it is that the speaker meant to imply X?’ where X is  $\neg q$ , and questions about logical inferences such as denying the antecedent (recall section 6.3). Both of these strategies were used in Thompson and Byrne’s (2002) study on counterfactual reasoning, and are likely to constitute a more natural and easier task for the participants than the judgment tasks in the experiments I conducted (Appendix A).

The experiment would involve changing the stimuli so that multiple causation is suggested in different ways. A control condition gives the sentences without any context. A ‘context condition’ includes a description of multiple causation as a background context. This way the multiple cause context itself can be separated from the linguistic cues in the target sentence. Finally, there is a condition in which the target sentence includes linguistic cues of the sort studied in this dissertation.

(260) control condition: the target sentence without context or cues suggesting multiple causation

context condition: a subjunctive conditional preceded by a context that suggests multiple causation

cue condition: a subjunctive conditional without context, but with some cues suggesting multiple causation as described in the dissertation

Examples:

a. If John had taken the bus, he would have been on time. [control]

b. [context: There are several ways to get to work . . . ] [context]  
If John had taken the train, he would have been on time.

c. If John had taken the train, he would ALSO have been on time. [cue]

The participants' responses to the target questions give a natural measure on how willing they are to draw pragmatic inferences under each experimental condition. As I said, I expect that in the context condition results are close to the control condition in that people tend to draw the regular conditional perfection and  $CF_q$  inferences, as opposed to the cue condition. The precise ratios (and values for potentially additional conditions that make multiple causation more or less explicit) will give a valuable insight in the actual processes that underlie speakers' recognizing multiple causation, and their relation to pragmatic inferences.

Eventually, I hope a dynamic semantics can be developed that models how the causal structure of the discourse is built incrementally as discourse progresses. This aspect of the project is of interest to computational work, because causal structure (and the distinction between single vs. multiple causes in particular) can be represented conveniently in a *causal network* (e.g. Pearl 2000). Since such a network is essentially a graph-theoretic object, it lends itself very naturally to computational modeling. Pearl (2000) develops a semantics for counterfactual conditionals that is based on operations on the causal network. It has been very influential in philosophical and psychological work (e.g. Rips 2010), and has also found application in linguistic semantics (e.g. Schulz 2007). The computational investigation of causal structure in relation to the pragmatics of conditionals will contribute to the goal of obtaining a theory of conditionals that is both precise in terms of linguistic semantics and pragmatics, and well grounded in research on conditional reasoning.

### *Cross-linguistic work*

In this dissertation I have been concerned with counterfactual conditionals English. It is well known that there is a lot of cross-linguistic variation in all the domains relevant to counterfactuality that I have discussed. These include variation in the marking of counterfactuality itself (Nevins 2002), the subjunctive/indicative mood contrast (Quer 2009), as well as focus marking (Büring 2010; Zimmermann and Onea 2011: §2.2). This opens the way to a cross-linguistic investigation of the relations between counterfactual inferences, the realization of subjunctive conditionals, and



the structure of discourse.

In order to end with a more specific proposal, recall my discussion of Nevins (2002) in section 5.2.2. He shows that in languages that have a dedicated marker for counterfactuality, Anderson-type conditionals that cancel  $CF_p$  are not possible. He suggests this is because cancellability is a property of an exclusion marker (in Iatridou's 2000 sense). Part of the proposal put forward in this dissertation is that the generation of  $CF_q$  is not related to an exclusion marker, but to conditional perfection instead. I thus predict that in the languages for which Nevins shows that  $CF_p$ -cancellation is *not* possible,  $CF_q$ -cancellation *is* possible (see my side note on page 114). This claim, which would further strengthen my claim that  $CF_p$  and  $CF_q$  are distinct phenomena, can be checked directly with speakers of the relevant languages.

## Appendix A Experiment on the differences between ‘also’ and ‘still’

In the dissertation I have discussed  $CF_q$ -cancellation contexts with ‘also’ (chapters 3, 4) separately from  $CF_q$ -cancellation contexts with ‘still’ (chapter 7), but I proposed the same analysis for both of them: when ‘also’ has a focus associate inside the antecedent of the conditional, or when ‘still’ takes scope over the modal verb in the consequent, they signal a multiple cause context. Multiple cause contexts block conditional perfection, which in turn prevents the generation of  $CF_q$  according to Karttunen’s schema.

In the data chapter (chapter 2), we saw that when used in  $CF_q$ -cancellation contexts, ‘still’ and ‘also’ have a very similar meaning, and often appear to be interchangeable, as for example in (A1).

(A1) If Mary had picked Box D, she would **still/also** have won \$100.

However, because these types of data have hardly been discussed in previous literature, we should be careful about making general empirical claims. There may be certain subtle differences between ‘also’ and ‘still’ that have not become apparent from the small set of data we have considered thus far. In this appendix I report on an experiment I conducted to investigate such potential differences between the use of ‘also’ and ‘still’.

Informal polling among linguists revealed that the difference between ‘also’ and ‘still’ in sentences like (A1) may have to do with certain contextual properties regarding the causes that are being compared. I first conducted a pilot study among linguists in order to get a better view on what these contextual properties might be. The final experiments then tested these properties on linguistically untrained subjects.

**Pilot study** The pilot study was a forced-choice task that asked participants to choose between ‘also’ and ‘still’ in conditional sentences. Twelve graduate students in linguistics volunteered to participate in the pilot study. For the materials, I selected 20 conditional sentences with ‘also’

and ‘still’ in their consequent from corpora.<sup>95</sup> I only selected sentences for which the surrounding context made it most probable that ‘also’ and ‘still’ were used to cancel  $CF_q$ .

These sentences and the surrounding context were presented to the participants in written form on a computer screen. The question accompanying each sentence was if they preferred ‘still’, ‘also’, or thought both were equally acceptable. In addition, for each sentence there was room to leave written comments about the sentence or intuitions about the difference. Here is an example from the test:

(A2) *And she felt blood spilling down her chin in a small stream. Still, her mind wasn't swelling, in spite of the pain and fear. It knew her one chance at life was making this man believe he'd be caught if he killed her. Of course he would also be caught if he let her go, but she would deal with that later.* [COCA]

Preference for ‘still’

Preference for ‘also’

Both equally good

Comments:

From the participants’ written comments I formulated the following hypothesis about two contextual properties that seem to play a role in speakers’ choice between ‘also’ and ‘still’:

(A3) Contextual conditions

1. Truth of the consequent: ‘also’ is preferred when the context makes clear that the consequent is taken to be false.
2. Compatibility of the causes: ‘also’ is preferred when the context makes clear that the causes are compatible.

Two causes  $p_1, p_2$  are *compatible* when the occurrence of  $p_1$  does not affect the probability of the occurrence of  $p_2$ .

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<sup>95</sup>Global Web-Based English (GloWbE), and Corpus of Contemporary American English (COCA), both available at <http://corpus.byu.edu/>.

The first condition concerns the truth value of the consequent in the actual world: is it taken to be true, or false? For example, in (A4) there was a preference for ‘also’, which some participants attributed to the falsity of the consequent: we know that Gore did not win the presidency.

(A4) *Gore would have won the presidency if he had carried Tennessee, his home state. But he would **also** have been elected if he had won New Hampshire, which he lost by a much smaller margin.*

[COCA]

This situation typically occurs when the counterfactual conditional with ‘also’ follows an earlier counterfactual conditional. We have encountered such cases before in chapter 4, when I talked about conjunctions of conditionals (e.g. (114) on page 82). Example (A5) is another case: the preference for ‘also’ was explained because the leakage didn’t actually occur.

(A5) *Leakage would occur if, as some critics fear, investors in JI projects deliberately overstate the baseline emissions level or otherwise exaggerate the expected level of abatement to increase the value of the credit. Leakage would **also** happen if an investor just shifted emissions elsewhere instead of actually reducing them.*

[COCA]

The second property relates to the nature of the different causes for the consequent that the context makes salient. ‘Also’ was preferred when, in the words of the participants, the causes were “independent”, “parallel”, or “separate” from each other. Because some of these terms have been used in a specific theoretical sense as well, I chose the more neutral notion *compatible*. I hypothesized that the definition in (A3) represents the participants’ intuitions:  $p_1$  and  $p_2$  are compatible if the occurrence of  $p_1$  does not affect the probability of the occurrence of  $p_2$ . The case of non-compatibility includes the case in which  $p_1$  and  $p_2$  are *exclusive* causes, meaning that if  $p_1$  occurs,  $p_2$  cannot occur (or vice versa), but it is also possible that two causes are non-compatible but not exclusive.

As an example of the Compatibility condition, consider (A6), in which ‘also’ was preferred (100%,  $n = 9$ ), and which presents two separate causes for the parent’s worry. The two causes are

compatible because suddenly stopping walking ( $p_1$ ), and suddenly forgetting how to pick up toys ( $p_2$ ) are separate causes: the occurrence of  $p_1$  does not make it more or less likely that  $p_2$  happens.

(A6) *If your baby started walking on her own, walked every day for two months and then suddenly stopped, you might be worried. You'd **also** be concerned if she suddenly seemed to "forget" how to pick up the toys she used to grasp with confidence.* [COCA]

Similarly, 'also' was preferred in (A7), which presents compatible causes for the same effect.

(A7) *Swift, sure justice for high-profile murder cases would create quite a media buzz. This would **also** occur if the rate of executions were increased dramatically.* [COCA]

In contrast, example (A8) involves exclusive causes (being an actress vs. not being an actress), so they are non-compatible. In this case all participants preferred 'still'.

(A8) *Since I was a little girl, I have grown up with movies as a very important part of my life. And if I wasn't an actress, I would **still** love to see what goes on behind the camera.* [COCA]

With these results of my pilot studies in mind, I designed the actual experiments to test more thoroughly if speakers are sensitive to the two contextual properties in (A3). Experiment 1 tested the Truth condition, Experiment 2 tested the Compatibility condition.

## A.1 Experiment 1: testing Truth

Experiment 1 was designed to test the effect of the Truth condition (whether the consequent is taken to be true or false, see (A3)) on how natural sentences with 'also' and 'still' were judged, while leaving the Compatibility condition fixed. We have seen in chapters 3 and 4 that intonation plays an important role in judging these sentences, for example in differentiating between a local and non-local reading of 'also'. Therefore I designed the experiment to have auditory stimuli, instead of just giving the target sentences in written form.

**Task and design** The experiment was an online study conducted on Amazon Mechanical Turk (Gibson et al. 2011), and coded by the author using Ibex software.<sup>96</sup> Participants listened to a recorded version of a dialogue between two persons, that was also displayed on the screen. Each dialogue was designed in such a way that A’s utterance set up the context, and B’s utterance contained the target sentence. The task was to judge on a 7-point scale how natural B’s utterance sounds (1=completely unnatural, 7=completely natural).

In order to ensure that the participants paid careful attention to A’s utterance (as the context may be crucial in their judgment of the target sentence), the experiment was designed in such a way that the playback was *incremental*. That means that, first, A’s utterance was played and at the same time displayed on the screen. Only when the recording had finished, the participant could continue to hearing and reading B’s utterance by clicking on a button. After that had finished, another click displayed the question “How natural is B’s response?” with a 7-point scale (see Figure 6).

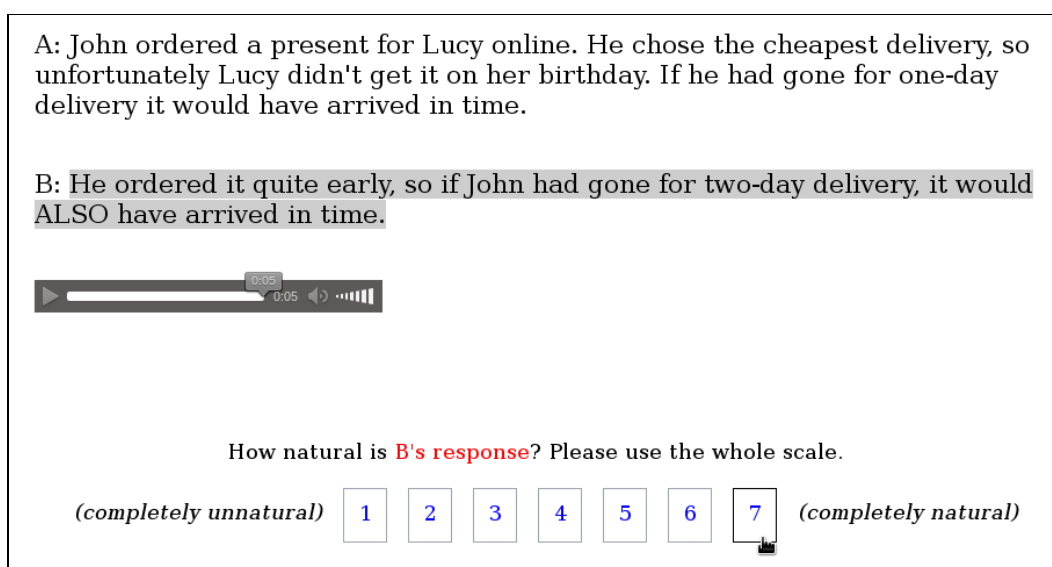


Figure 6. Design of Experiment 1

After a practice sequence, each participant saw, in randomized order, 16 target items, 10 conditional fillers, 10 non-conditional fillers and 4 catch items (two that were clearly good, and two that were clearly bad), so 40 items in total. The experimental set-up was based on a counterbalanced

<sup>96</sup>Available at <http://spellout.net/ibexfarm/>.

Latin Square design ( $\{\text{Also, Still}\} \times \{\text{True, False}\}$ ), so that each participant saw exactly one of the four conditions for each item:

	True	False
Also	4	4
Still	4	4

**Materials** The target stimuli were designed in such a way that:

- For each item, the causes were incompatible.
- For each item, the consequent for the True and False conditions were identical in form.
- For each item, the context made clear that besides the compared and asserted cause, there were more possible causes (i.e., no exclusive causes  $p$  and  $\neg p$ ).
- In the True condition, the truth of the consequent is asserted by A's utterance. In the False condition, the falsity of the consequent is not asserted, but is an inference from another counterfactual conditional in A's utterance.

Two graduate students in linguistics who were native speakers of English recorded the stimuli. They were instructed to pronounce the target sentences with a CT accent on the topic in the antecedent, as well as a rising accent on the focus particle in the consequent. They tried to keep this prosodic pattern as fixed as possible throughout the target items, and use a natural prosody throughout all stimuli. All stimuli, in written form, are given in Appendix A.4.

**Results** Sixty subjects participated in the experiment. Only the results of participants who gave a score of 1, 2 or 3 on the two bad catch items, and 5, 6 or 7 on the two good items were included. It happened to be the case that only 30 out of 60 participants passed this test. The reason for this poor performance is unclear.

The overall averages and standard deviations per condition are given in Figure 7a.

	True	False
Also	$\mu = 5.10$ $\sigma = 1.53$	$\mu = 5.30$ $\sigma = 1.48$
Still	$\mu = 5.20$ $\sigma = 1.49$	$\mu = 5.35$ $\sigma = 1.43$

(a) All 30 participants

	True	False
Also	$\mu = 4.89$ $\sigma = 1.43$	$\mu = 5.04$ $\sigma = 1.42$
Still	$\mu = 4.94$ $\sigma = 1.43$	$\mu = 5.12$ $\sigma = 1.39$

(b) 26 participants

Figure 7. Scores per condition (1 = most unnatural, 7 = most natural)

The scores of around 5.2 may be somewhat biased in the direction of the top-end of the scale, as a by-participant analysis showed that four participants gave almost only 7s to all target items (although they did pass the catch item test). The result of removing those four participants on the scores is given in Figure 7b.

In either case the conclusion is that the differences between the four cells are very small, and that this experiment gave no support to the claim that the condition of truth of the consequence in (A3) makes a difference for speakers' choosing between 'also' and 'still'. One may take this to suggest that contrary to the intuitions of the participants of the pilot study, the Truth condition does not play a role in the difference between 'also' and 'still', but I believe there are a number of problems with the experimental set-up that should dissuade us from drawing any theoretical conclusion at all from the results in Figure 7.

First of all, the poor performance on the catch items (just 50% passed the rather lax test described above) shows that for some reason the participants didn't do well on the test in general. As for the target items, judging by some comments I got from participants, the task was probably too hard given the amount of attention they were willing to allocate to it. The contextual differences in the data are very subtle, and it is not so easy for linguistically untrained subjects to judge a combination of context, intonation, and lexical items ('also'/'still') on a 7-point scale. Because a relatively extensive context had to be provided, it is moreover quite likely that other lexical or semantic aspects of the context have played a role in how the participants formed their judgment on the scale. An on-line test not conducted in the strictly controlled setting of a laboratory is presumably not the best procedure for investigating these types of semantic judgment.

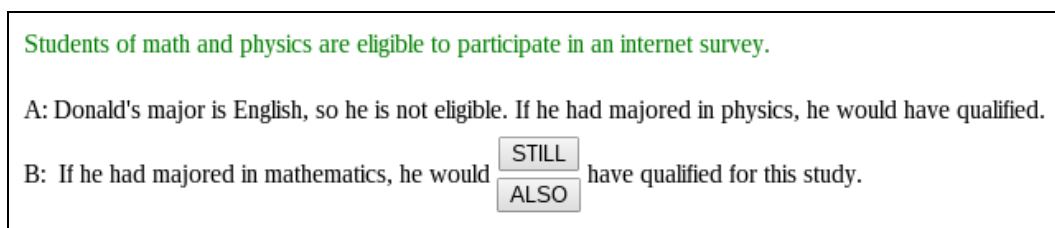


For reasons of time and resources, I have not been able to explore the role of the Truth condition in further experiments, and I leave this to future research. Instead, I move on to the experiment that tests Compatibility and which, in view of the lessons learned from Experiment 1, has a simpler design.

## A.2 Experiment 2: testing Compatibility

This experiment tested speakers' preference between 'also' or 'still' under the condition of Compatibility of the causes (see (A3)), while keeping the Truth condition fixed. In view of the results from Experiment 1, I changed two aspects of the design. First, the experiment had no auditory, but only written stimuli, and second the task was a forced-choice task, rather than a graded judgment task.

**Design** Before the experiment started there were some practice items, explaining the idea of the task, in particular instructing the subjects to pay attention to focal stress (indicated by capital letters), and to take into consideration the meaning of B's utterance in view of the given context. As in Experiment 1, the dialogue was displayed incrementally, i.e. each subsequent part was displayed at the click of a button. Instead of a 7-point scale in Experiment 1, the target sentence now contained a choice between two buttons 'also' and 'still', as shown in Figure 8. The order of the buttons was randomized for each item.



Students of math and physics are eligible to participate in an internet survey.

A: Donald's major is English, so he is not eligible. If he had majored in physics, he would have qualified.

B: If he had majored in mathematics, he would   have qualified for this study.

Figure 8. Design of Experiment 2

**Materials** The experiment included 8 target items in two conditions (Comp and NComp), that were designed with the following controls:

- For each pair, the two variants are roughly about the same topic (perfect minimal pairs are not possible, because a compatible to non-compatible switch involves changing the context quite a bit).
- All items have false consequents (the condition that had higher scores in Experiment 1).
- The consequents are identical for the two target sentences in each pair.
- All target items are two-past counterfactuals.

The target items were offered in a randomized, counterbalanced way. These were interspersed with 16 filler items testing sentences that were unrelated, but also offered a choice between two words or groups of words. All target and filler items are listed in Appendix A.5.

**Results** Again, the experiment was conducted online on Amazon Mechanical Turk, and 60 participants took part.

The participants performed well on the filler items: the items that were designed to have only one acceptable answer had that answer chosen by 80% or more of the participants, including a couple of unanimous responses by all 60 participants. The items that were designed to be more mixed, indeed received more mixed responses.

On the target items there was an overall preference for ‘also’:

Condition	Percentage ‘also’ responses	Percentage ‘still’ responses
Comp	71.7%	28.3%
NComp	63.8%	36.2%

The results broken down per item are given in Figure 9.

We find that ‘also’ is chosen more often under the Comp condition, in accordance with the hypothesis in (A3). However, on a paired *t*-test the Comp/NComp difference is not significant ( $p = 0.21$  over items,  $p = 0.19$  over subjects). Interestingly, there are four items (1,2,3,8) for which there is no or almost no difference between the two conditions, while the other four items (4,5,6,7) have a

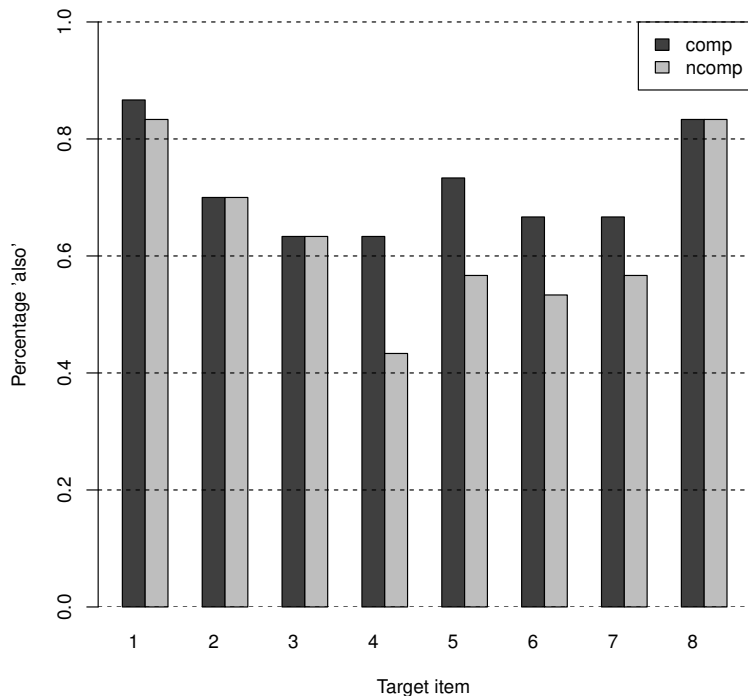


Figure 9. Percentage of ‘also’ responses on the target items (numbering corresponds with the target items listed in Appendix A.5)

bigger preference for ‘also’ under Comp. If we only consider items 4,5,6,7, the difference between Comp and NComp is significant  $p < 0.05$  (over items  $p = 0.049$ , over subjects  $p = 0.008$ ).

It is not entirely clear how items 4,5,6,7 differ from the rest. What might have played a role in at least some of these is that the context explicitly presents a choice (solar panels vs. electric car in 5C,<sup>97</sup> 10 vs. 11 years in 5NC, different options for health insurance in 6C), which may make it easier to understand whether the causes are compatible or not. On the other hand it should be noted that although the stimuli were designed to strongly suggest either a Compatible or Non-Compatible interpretation, it is possible that because of differences in the participants’ background knowledge and assumptions, contexts were interpreted differently than I had intended (for example whether or not students can double-major may make some difference for example 2NC).

It is informative to not only look at each pair individually, but also at the differences across the

<sup>97</sup>Codes such as 5C and 5NC refer to the example numbers in Appendix A.5.

items. There are quite big differences, for example 1NC and 8NC have 83% ‘also’ responses, while 4NC has 43% ‘also’ responses (the only item that had a majority of ‘still’ responses). Again, the experimental set-up only allows us to speculate about the source of these differences, but they may be related to the fact that in item 1 (different countries) and item 8 (the context with the different boxes) the different causes are distinguishable very clearly, either for metaphysical reasons (you can’t be in two countries at once) or because the context explicitly states so (the specific rules of the game show), causing a high percentage of ‘also’ responses. In item 4 (effects of economical growth), on the other hand, analyzing the cause-effect relations may require more background knowledge.

Finally, it should be noted that 16 participants picked ‘also’ in all 8 target items, and 1 participant picked ‘still’ in all 8 target items. This may suggest that there are different ‘dialects’: there is one group of speakers that only likes ‘also’ irrespective of the Compatibility factor, and a second group of speakers for whom Compatibility does matter in choosing between ‘also’ and ‘still’. If this were indeed true, it would give an explanation of why there is so much variation in the results of Experiment 1 and 2.

The general conclusion from the experiments is that there is some weak evidence that Compatibility plays a role, but that overall speakers do not appear to have a strong contrast between ‘also’ and ‘still’. In the next section I make some more general remarks about the role of these experiments in relation to the (theoretical) goals of this dissertation.

### **A.3 General experimental remarks**

One general conclusion from the experiments is that linguists gave different responses than untrained participants. In the pilot study, the linguistically trained participants mostly agreed on whether ‘also’ or ‘still’ was better, and provided informed intuitions about what this difference might amount to. In Experiment 1 and 2, the linguistically untrained participants did not show a very clear sensitivity to the difference between ‘also’ and ‘still’. The question whether linguists give ‘better’ or more reliable judgments than non-trained speakers is a much discussed issue. For

example, there has been experimental work showing that there are no big differences between the responses of professional linguists and non-linguist college students on syntactic judgment tasks (see [Gross and Culbertson 2011](#) and references cited therein). It should be noted though that the experiments I conducted are different from a syntactic judgment task, as they involved very subtle felicity judgments, that moreover depended on the right interpretation of focus and conditional relations. Therefore it is not surprising that in this particular case the linguists' responses were more useful for my purposes, in particular the written comments obtained from the pilot test on which I based the criteria in (A3).

This should not be taken to suggest that experimental work with non-trained speakers could not be very informative in this project (see also my remarks on this in the conclusion, chapter 8). I think that if new experiments on the differences between 'also' and 'still' in  $CF_q$ -cancellation contexts were conducted in future work, they should be preceded by some more general experimental paradigm that tests how participants interpret (counterfactual) conditionals in the first place. Linguists' assumptions about the interpretation of conditionals may deviate from how speakers actually interpret them. As an illustration of this, I shall briefly present two experimental studies from the psychological literature that investigated counterfactual inferences, and the effects of the one-past/two-past distinction, respectively.

In [Thompson and Byrne \(2002\)](#), as part of a larger study on counterfactual reasoning, participants were asked what they thought the speaker of a conditional statement meant to imply. Participants were presented with indicative and (two-past) subjunctive conditionals, and were asked if the speaker meant to imply the falsity of the antecedent (i.e.  $CF_p$ ) and the falsity of the consequent (i.e.  $CF_q$ ). For indicative conditionals only 2% and 1% thought that the speaker meant to imply the falsity of the antecedent and the consequent, respectively. For two-past subjunctives, 48% and 47% thought that the speaker meant to imply the falsity of the antecedent and the consequent. So while the participants clearly have a contrast between indicatives and subjunctives, the percentage of participants recognizing  $CF_p/CF_q$  was relatively low. Of course the methodology of asking what the speaker may have implied is not by itself a conclusive measure of the strength of counterfac-

tual inferences, but at least it suggests that counterfactual suppositions may not be as strong as (theoretical) linguists have taken them to be.

Rips (2010) tested participants' counterfactual reasoning skills by presenting them with causal network diagrams. Participants were asked questions of the type *If component C were not operating, would component A be operating?*, where A and C referred to nodes in the diagram. Rips tested if participants responded differently if the questions were two-past subjunctives rather than one-past subjunctives. The results for both types of questions were very similar, and the effect was not statistically significant (Rips 2010: 192).

In the linguistic literature both counterfactual inferences and the differences between one-past and two-past subjunctive conditionals have been taken as important empirical desiderata for a semantic theory of counterfactual conditionals. Experimental studies such as the ones mentioned above show that these empirical phenomena may not be quite as strong as expected in the theoretical literature. It is likely that this will have affected my experimental work, which presumed that participants interpreted conditionals in a certain way, and then asked subtle judgments about them.

In subsequent experimental work to get a better view on constraints like (A3), therefore, I think that felicity judgment tasks on 'also' and 'still' should be preceded by tasks that help us get a view on how conditionals are interpreted. Once we have an idea of how a participant understood a particular subjunctive conditional (by using, for example, some of the tests Thompson and Byrne 2002 used), it is easier to understand their response to more specific experimental tasks regarding 'also' and 'still'. Ideally, I would also like to check how participants interpret 'also' (i.e. what they take to be its associate) and 'still'. One difficulty in designing the stimuli was to design the context in such a way that it was clear that 'also' should be interpreted as non-local, and 'still' as taking wide scope. The auditory stimuli in Experiment 1, and the indication of focus by capital letters in Experiment 2, should have helped the participants, but it is still possible that some participants have taken different interpretations.

In addition, a methodology as in Rips (2010) in which the stimuli did not contain a description of the context but an actual causal diagram, may give better results. This method should take care

of some of the worries about speakers' background assumptions on the cause-consequent relations in the stimuli (see my discussion in the previous section).

#### A.4 Stimuli for Experiment 1

16 target items (T = True, F = False)

1 Linda is participating in a television game show where she can choose ONE box which may contain a monetary prize. The boxes are filled as follows (Linda can not see their content):

Box 1	Box 2	Box 3	Box 4	Box 5
\$ 100	–	\$ 100	–	–

1T A: Linda was really lucky, she picked Box 3.

B: If she had chosen Box 1, she would ALSO / STILL have won \$ 100.

1F A: Too bad. Linda picked Box 2. If she had chosen Box 1, she would have won \$ 100.

B: If she had chosen Box 3, she would ALSO / STILL have won \$ 100.

2 There are three ways to get to the airport. You can take a cab, the subway or the bus.

2T A: Michael was running a bit late, but he took a cab so he made it to the airport in time after all.

B: The subway is really good here. So if Michael had taken the subway, he would ALSO / STILL have made it on time.

2F A: Michael missed his flight because he took the bus to the airport and it got a flat tire. If Michael had taken the subway, he would have made it on time.

B: If he had taken a cab, he would ALSO / STILL have made it on time.

3 You need to either write a paper or take a final exam to pass the class.

3T A: Did you hear? Peter wrote a great term paper, he passed with an A!

B: Peter is so smart, if he would have taken the exam, he would ALSO / STILL have passed with an A.

3F A: Unfortunately, Peter was sick for two weeks, and he could not take the exam or write a paper. He'll have to retake the class. I feel so bad for him. I am sure that if he had taken the exam, he would have passed with an A.

B: If he had written a paper, he would ALSO / STILL have passed with an A.

4 You can either fly to San Francisco, drive on the I-5, or take the 101.

4T A: I am so glad that Barbara took the plane, she's on time for our meeting! If Barbara had taken the 101, she would have been late.

B: If she had taken the I-5, she would ALSO / STILL have been late.

4F A: Barbara is late for our business meeting, because she took the 101. If she had taken the plane, she would have been on time.

B: If she had taken the I-5, she would ALSO / STILL have been on time.

5 John has a choice of three classes for his flight to New York: economy class, business class, or first class.

5T A: John bought a first class ticket. That meant he got complimentary champagne!

B: If he had bought a business class ticket, he would ALSO / STILL have gotten complimentary champagne.



5F A: John bought an economy class ticket. But if he had gone for first class, he would have gotten complimentary champagne!

B: In fact, if he had just gone for business class, he would ALSO / STILL have gotten complimentary champagne.

6 Some people got sick after eating at Restaurant “Chez Jean”.

6T A: Rick had a steak there yesterday, and he was indeed sick this morning.

B: I heard steak was one of two bad dishes. If he had ordered chicken, he would ALSO / STILL have been sick this morning.

6F A: I am so happy Rick didn't go there! If he had eaten steak, he would have been sick this morning.

B: If he had eaten his usual chicken dish, he would ALSO / STILL have been sick this morning.

7 The winner of our department's annual scholarship has been announced.

7T A: It has been awarded to Ann! And because her husband works at CNN, our department will be featured on TV!

B: Joe knows people at ABC News, so if it had been awarded to Joe, the department would ALSO / STILL have been featured on TV.

7F A: It has been awarded to Ann! Unfortunately, her research is so abstract, there won't be any publicity. Kim does research on pop music, so if she had gotten the scholarship, the department would have been featured on TV.

B: Joe does research on Hollywood films. So, I'm sure if it had been awarded to him, the department would ALSO / STILL have been featured on TV.

8 The Green City of the Year has just been announced.

8T A: We have been made Green City of the Year! The jury said we won because we opened 5 new parks this year.

B: If we had opened just 3 new parks, we would ALSO / STILL have won.

8F A: Our city didn't make Green City of the Year because of all the air pollution. If the council had spent all of this year's budget on subsidizing electric cars, we would have won.

B: If the council had spent all of this year's budget on closing down factories, we would ALSO / STILL have won.

9T A: After high school, Eric was unsure if he should major in computer science, economics, or French. But in the end he chose computer science. That's why he now has an excellent job.

B: If he had studied Economics, he would ALSO / STILL have had an excellent job.

9F A: After high school, Eric was unsure if he should major in computer science, economics, or French. But in the end he chose French. Unfortunately he hasn't found work yet. If he had majored in computer science, he would have had an excellent job.

B: If he had studied Economics, he would ALSO / STILL have had an excellent job.

10T A: Melissa came 4th in rowing in the Olympics. Because of her top-10 result, she received a special award from her local club.

B: Really? So, if she had become as low as 10th, she would ALSO / STILL have received the special award.

10F A: Melissa came 4th in rowing in the Olympics. That means she missed a special award from her local club. If she had gotten gold, she would have received the special award.

B: Well, if she had gotten silver or bronze, she would ALSO / STILL have received the special award.

11T A: Lucy ordered some new tableware for her dinner party. She chose one-day delivery, so it arrived well before the party.

B: The party isn't until Friday, so if she had gone for two-day delivery, it would ALSO / STILL have arrived in time.

11F A: John ordered a present for Lucy online. He chose for the cheapest delivery, so unfortunately Lucy didn't get it on her birthday. If he had gone for one-day delivery it would have arrived in time.

B: He ordered it quite early, so if John had gone for two-day delivery, it would ALSO / STILL have arrived in time.

12 Last month, Bill received three job offers from companies Apex Ltd., Beaver & Co and Cooper Industries.

12T A: Bill has accepted the offer from Apex, which means he now drives a brand new company car.

B: If he had accepted the offer from Cooper Industries, he would ALSO / STILL have had a company car.

12F A: Bill has accepted the offer from Apex. It pays well, but he doesn't have a company car. If he had accepted the offer from Cooper Industries, he would have had a company car.

B: If he had accepted the offer from Beaver & Co, he would ALSO / STILL have had a company car.

13T A: For our school dinner, we could only afford paper, plastic or foam cups. We went for the plastic ones, it didn't look elegant, but at least the drinks tasted nice.

B: If you had gone for the paper cups, the drinks would ALSO / STILL have tasted nice.

13F A: For our school dinner, we could only afford paper, plastic or foam cups. We went for the

foam ones, and the drinks tasted terrible! If we had bought the plastic cups, the drinks would at least have tasted nice.

B: If you had gone for the paper cups, the drinks would ALSO / STILL have tasted nice.

14T A: Chris and Sue got married in Germany. It was a great wedding, and in particular they loved the local food.

B: If they had got married in France, they would ALSO / STILL have had great food.

14F A: Chris and Sue got married in Germany. It was a great wedding, except they didn't like the food. If they had got married in Italy, they would have had great food.

B: If they had got married in France, they would ALSO / STILL have had great food.

15T A: Jean won \$10,000 in the lottery, and initially she wasn't sure what to do with the money. Eventually she decided to donate it to charity, which was covered on the local news.

B: If she had given it all to her sick brother, she would ALSO / STILL have been covered on the news.

15F A: Jean won \$10,000 in the lottery. She is so desperate to appear on TV that she donated everything to the local TV station, hoping to get an interview. However, it didn't work. I think if she had given the money to a real charity, she would have been covered on the news.

B: Yes, and if she had given it all to the treatment of her sick brother, she would ALSO / STILL have been covered on the news.

16 A historic secret document has recently been decoded. It turned out to be written in Polish.

16T A: Excellent! Melissa knows Polish, so she can help translate the document.

B: Melissa also knows Russian, so if the document had been in Russian, she would ALSO / STILL have been able to help translate the document.

16F A: Too bad! Melissa doesn't know any Polish, so she won't be able to help translate the document. She is fluent in Russian, so if the text had been Russian, she certainly would have been able to help.

B: Melissa also knows French, so if the document had been in French, she would ALSO / STILL have been able to help translate the document.

### 10 conditional fillers

1. A: It was a glorious day on the beach today. Such a pity that Jason had to be at the office all day. I am sure that if Jason had had time, he would have joined us and gone swimming.

B: No, I think if Jason had had time, he would have mainly been sunbathing.

2. A: Amy went to New York last week. It was quite cold there. If she had gone to Chicago, she would have had much better weather.

B: Yes, but if she really likes snow and ice, as she claims, she certainly wouldn't have gone there.

3. A: Let's try to schedule Mary's job interview. If she has time on Tuesday, let's ask her to come to my office.

B: Yes, but if she only has time on Friday, she should come to the director's office.

4. A: I heard you are going to do extra work for our project. I really don't understand it: if you work 60 hours a week already, why did you accept this extra work?

B: Of course, I would have refused it if I was in a position to, but I really wasn't.<sup>98</sup>

5. A: I know Gary has been busy with all kinds of things lately, so I don't know if Gary actually submitted his paper.

B: The professor is very strict, so if he he didn't, he would be in trouble now.<sup>99</sup>

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<sup>98</sup>Modeled after Decker and Reed (2001: 186, ex. (338)).

<sup>99</sup>Modeled after Decker and Reed (2001: 163, ex. (282)).

6. A: I tried calling Peter at home, but I am not sure if he is back from vacation yet.  
B: If he isn't, he might be in trouble now.<sup>99</sup>
7. A: Would you believe it? My car again didn't start this morning. I just wish I had money for a new car.  
B: If I was a millionaire, I would buy you a new car right away.
8. A: We've been having leakages again. But I called my plumber on Monday and he came and repaired our sink the very same day!  
B: If he is always willing to do the job immediately, I think I'd better hire him too.<sup>100</sup>
9. A: Mary is so glad her new boyfriend doesn't smoke.  
B: Oh yes, I am sure that if he had been a smoker, she would have told him to stop.
10. Pete has an exam in two days time.  
A: I spoke to him yesterday, and Pete has been studying for the exam all week long.  
B: I know, it will be a real shame if he will fail the test.<sup>101</sup>

## 10 non-conditional fillers

1. A: I heard that Professor Brown just gave her first lecture. How did it go?  
B: Really bad. Less than 10 students had any idea of what she was talking about.
2. A: I saw many bad reviews about your brother's hotel. Did he get many cancellations?  
B: No customers cancelled until the reviews started appearing.
3. A: You should stop using movie quotes in your article. People will have no idea what you are on about.  
B: Each person who has ever seen any movies will recognize the quotes, I'm sure.

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<sup>100</sup>Modeled after Declerck and Reed (2001: 206, ex. (384)).

<sup>101</sup>Modeled after Declerck and Reed (2001: 397, ex. (815)).

4. A: I hear you are traveling to Africa! How exciting. But you should first talk to friends who have been in Africa before.

B: I know at most 5 people who have ever been to Africa.

5. A: I've been unemployed for six months now. I really think that my website doesn't stand out enough to be noticed.

B: I think few companies look at your website until they invite you for an interview.

6. A: My father sent me some of their holiday pictures, but I can't seem to open this e-mail attachment.

B: Yes, this is the sort of file you have to download first in order to open.

7. B is reading a book.

A: I thought you said you didn't have time to read books this week!

B: Yes, but this is a special book that a teacher gave to me after reading it himself.

8. B just comes back from the boss's office.

A: How did it go? Did you tell him our objections to the new project?

B: No, he is the sort of person that you just have to smile to when you listen to.

9. A: I am visiting David in the hospital, but I don't want to bring the flowers as you did. Which ones did you buy?

B: I'm really bad with flower names. They are beautiful, yellow, big flowers.

10. A: I really enjoyed these lecture series on classical music. Did you know the speaker before?

B: Yes, she is a Canadian, well-known, international expert on medieval music.

#### **4 catch items**

1. A: I have been looking for Pete's phone number for three days. Are you sure you don't have it in your old phone?

B: If I had his number, I would tell you yesterday.

2. A: Because of the bad weather, I suppose not many students came to class. Do you know which students did attend class today?

B: Only Kevin attended, and only Maria attended.

3. A: I lost the conference program booklet. Can you tell me who is giving a speech today?

B: PAUL is giving a speech.

4. A: You were at the alumni meeting, weren't you? I am wondering which of our students have a job now.

B: Bryan has a job, and Katie ALSO has a job.

## A.5 Stimuli for Experiment 2

**8 target items** (C = compatible, NC = non-compatible)

1C Mary and Peter visited several European countries on their recent trip.

A: They only went to Central Europe, and they didn't like the food there. If they had visited France, they would have had great food.

B: If they had gone to Portugal, they would ALSO / STILL have had great food.

1NC A: Chris and Sue got married in Germany. It was a great wedding, but they hated the food. If they had got married in Spain, they would have had great food.

B: If they had got married in Italy, they would ALSO / STILL have had great food.

2C In order to participate in a study, you must be a heavy drinker and/or smoker.

A: Fred only drinks on the weekend, but if he drank as much as his father, he would certainly have qualified for this study.

B: Well, if he smoked a lot, he would ALSO / STILL have qualified for this study.

2NC Students of math and physics are eligible to participate in an internet survey.

A: Donald's major is English, so he is not eligible. If he had majored in physics, he would



have qualified.

B: If he had majored in mathematics, he would ALSO / STILL have qualified for this study.

3C The three winners of our department's annual scholarship have just been announced.

A: Too bad Sarah didn't get it! Her research is on Hollywood movies, so our department would have been featured on TV if she got a scholarship!

B: Michael studies pop music, so if Michael had gotten a scholarship, our department would ALSO / STILL have been featured on TV.

3NC The winner of our department's annual scholarship has been announced.

A: It has been awarded to Ann! Unfortunately, her research is so abstract, there won't be any publicity. Kim does research on pop music, so if she had gotten the scholarship, the department would have been featured on TV.

B2: Joe does research on Hollywood films. So, I'm sure if it had been awarded to him, our department would ALSO / STILL have been featured on TV.

4C The Saudi economy has been in decline for years because of decreasing oil revenue.

A: If oil companies had made more money in 2012, the Saudi economy would certainly have profited.

B: Well, if the car industry had made more money in 2012, the Russian economy would ALSO / STILL have profited.

4NC Unemployment rates in Greece have risen in the last few years.

A: If unemployment rates had been stable in 2012, the Greek economy would have profited.

B: If unemployment rates had fallen in 2012, the Greek economy would ALSO / STILL have profited.

5C Under a new law, owners of electric cars and people with solar panels on their roof get a tax deduction.

A: Laura just bought a diesel car. If she had opted for an electric car, she would have gotten

a tax deduction.

B: If she had gotten solar panels on her roof, she would ALSO / STILL have gotten a tax deduction.

5NC If you own a car that is 10 or 11 years old, you get a tax deduction.

A: James's car is too new, he doesn't qualify. If his car had been 10 years old, he would have qualified.

B: If his car had been 11 years old, he would ALSO / STILL have gotten a tax deduction.

6C For a new health insurance, above the basic coverage, you can add extra coverage for dentistry, physiotherapy, and orthopedics.

A: My father just has basic coverage, but had he opted for dentistry coverage, he would definitely have saved money.

B: If he had opted for coverage for physiotherapy, he would ALSO / STILL have saved money.

6NC Christine does not have health insurance.

A: She has a very high health costs. If she had had a collective insurance from her employer, she would have saved money.

B: If she had had a private insurance, she would ALSO / STILL have saved money.

7C For his vacation, John crossed Europe by taking several buses and taxis.

A: He traveled so slow, he wasn't back in time for the start of his new job. If he had taken some flights, he would have been on time.

B: If he had taken some trains, he would ALSO / STILL have been on time.

7NC A: John flew to New York. Because of the storm, he arrived way too late. If he had gone by train, he would have been on time.

B: If he had taken the car, he would ALSO / STILL have been on time.

8C Mark is participating in a television game show where he can choose TWO boxes which may contain prizes. The boxes are filled as follows (Mark cannot see their content):

Box 1	Box 2	Box 3	Box 4	Box 5
\$ 100	–	\$ 100	–	–

A: Too bad! Mark picked Box 4 and 5. If he had chosen Box 1, he would have won a prize.

B: If he had chosen Box 3, he would ALSO / STILL have won a prize.

8NC Lisa is participating in a television game show where she can choose ONE box which may contain a prize. The boxes are filled as follows (Lisa cannot see their content):

Box 1	Box 2	Box 3	Box 4	Box 5
\$ 100	–	\$ 100	–	–

A: Too bad! Lisa picked Box 4. If she had chosen Box 1, she would have won a prize.

B: If she had chosen Box 3, she would ALSO / STILL have won a prize.

### 8 fillers (NPIs)

1. Speaker A teaches a class.

A: My student Bill only read 3 of the 5 papers I assigned to him. What is our official policy in such a case?

B: Since he didn't read some/any papers, he should get 10% off his grade.

2. Participants of a chess tournament who won none of their 10 matches, get degraded to a lower division.

A: Did you hear? David played in the tournament today, but he got degraded.

B: Really? I didn't realize that he failed to win some/any matches.

3. A: People tell me that Smith has been ripping off people in his store. I will search online for news about this scandal.

B: OK. Let me know if you find out something/anything interesting.

4. Speaker A has just started her new job as a cleaner.

A: Which room should I clean first?

B: It doesn't matter, some/any room will do.

5. A: For Gary's new sci-fi movie, he needs an expert on quantum physics to make the plot more realistic.

B: I'll contact Caltech, and I think we will find someone/anyone who can help him there.

6. A: I am very positive that our new advertising campaign will raise our sales.

B: I doubt if some/any clients will be interested in buying a new car.

7. Speaker A works as an assistant in the lab of a famous professor.

A: What should I do all day long in the lab?

B: Keep looking at the computer. Whenever there is some/any result on the screen, you should inform me immediately.

8. A: I heard Catherine wasn't admitted to the film school project, because she lacked background.

B: Yes, that's right. She has never seen some/any movies, so she should see those first and then apply again.

### **8 fillers ('only' vs. 'just')**

1. A: I heard you bought a new laptop! How do you like it?

B: It stopped working after just / only three days.

2. A: Does Patrick have a high position in that organization?

B: No, he is just / only a simple clerk.

3. A: Did Lisa arrive a long time ago?

B: No, she just / only arrived.

4. A: You are calling me in the middle of a meeting! Is it something urgent or can you call back later?  
B: I just / only wanted to say that it's raining.
5. A: How many people did you have for dinner last week?  
B: { I only / Only I } invited PETER for dinner.
6. A: Do you think Richard bought many things on his vacation?  
B: He said that he { only bought / bought only } a BOOK.
7. A: This is terrible! I expected ten volunteers to speak at my event, but only Maria signed up.  
B: Is { SHE only / only SHE } going to speak?
8. A: How many people did your boss say put in an order yesterday?  
B: He { claimed only / only claimed } that FRED had put in an order.

## Appendix B Recordings from production experiment

I conducted a small, preliminary production experiment to see how native speakers pronounce subjunctive conditionals with ‘also’ and ‘still’ in their consequent. Two native speakers of English who were trained in linguistics, but unaware of the purpose of the experiment, recorded a number of sentences (the speakers are coded as s1 and s2 below). The sentences were presented to them in written form on a computer screen, and preceded by some context in order to ensure that the participants got the intended interpretation.

I had the speakers pronounce three different conditionals in contexts that suggested that  $CF_q$  was cancelled: sentence (A9) (pitch tracks for the recordings are given in Figures 10 and 11, all figures are annotated with tones and break indices according to ToBI), sentence (A10) (Figures 12 and 13), and sentence (A11) (Figures 14 and 15). They all show contrastive topic accents in the antecedent, and L+H\* accents on ‘also’ and ‘still’.

(A9) [context: Mary applied to UCLA, MIT, and NYU. If Mary were admitted to UCLA, she would get funding.]

Well, if Mary were admitted to MIT, she would also/still get funding.

(A10) [context: Peter is very rich and as a result he has many friends.]

Yes, but if he were nice, he would also/still have friends.

(A11) [context: the Riemann conjecture is a famous unsolved problem in mathematics. Somebody claims that if the Riemann conjecture were proven to be true, it would have major consequences for prime number theory.]

Well, if the Riemann conjecture were proven to be false, it would still/also have major consequences for prime number theory.

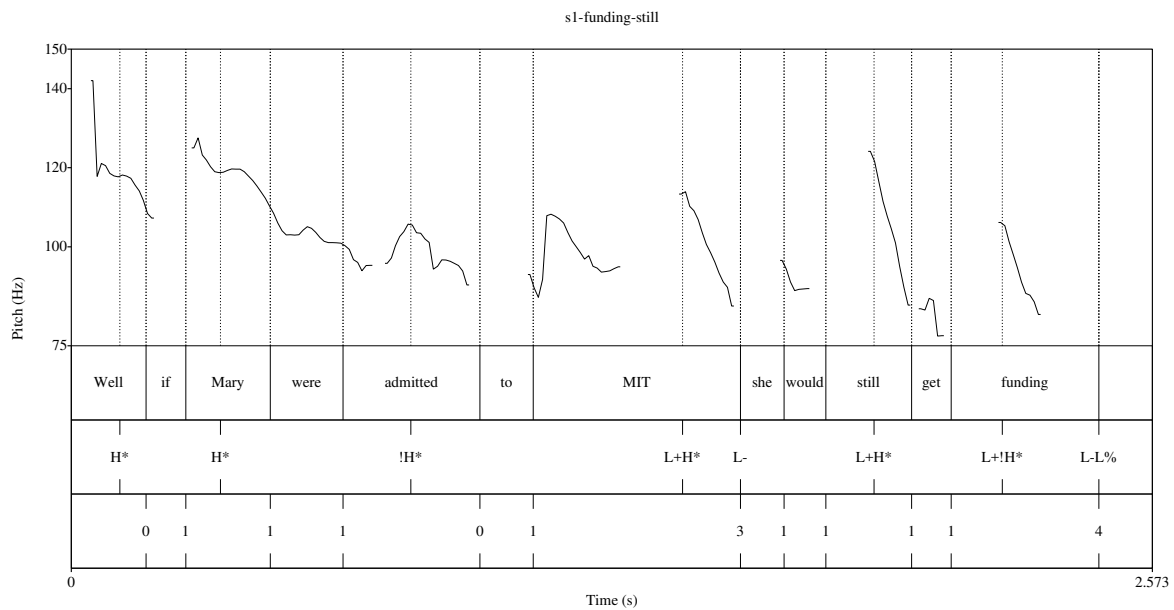
Finally I had the speakers record the following sentence with consequent-internal ‘still’ (pitch tracks in Figure 16).

(A12) My uncle is very rich. If he gave away a million dollars to charity, he would still be very rich.

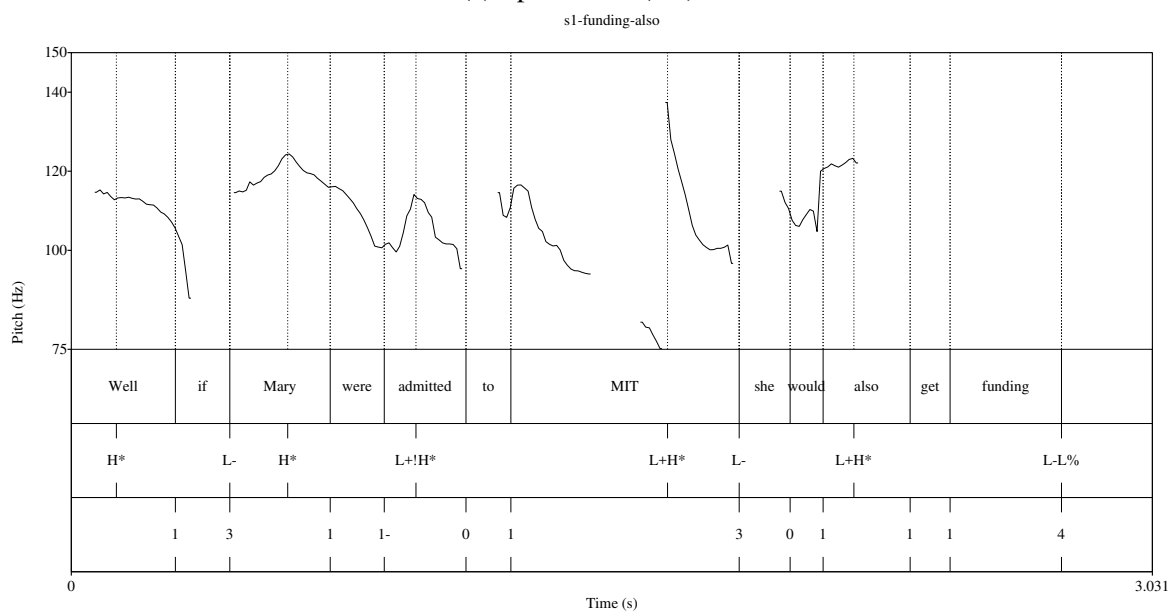
We find the same L+H\* accent on consequent-internal ‘still’ in (A12), as we found for consequent-external ‘still’ in the previous three cases.<sup>102</sup>

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<sup>102</sup>The experiment also included data with local ‘also’. However, there was some misunderstanding with respect to the context that I had provided. Because the participants didn’t get the intended interpretation of the sentence, the results were invalid, and they are not presented here.



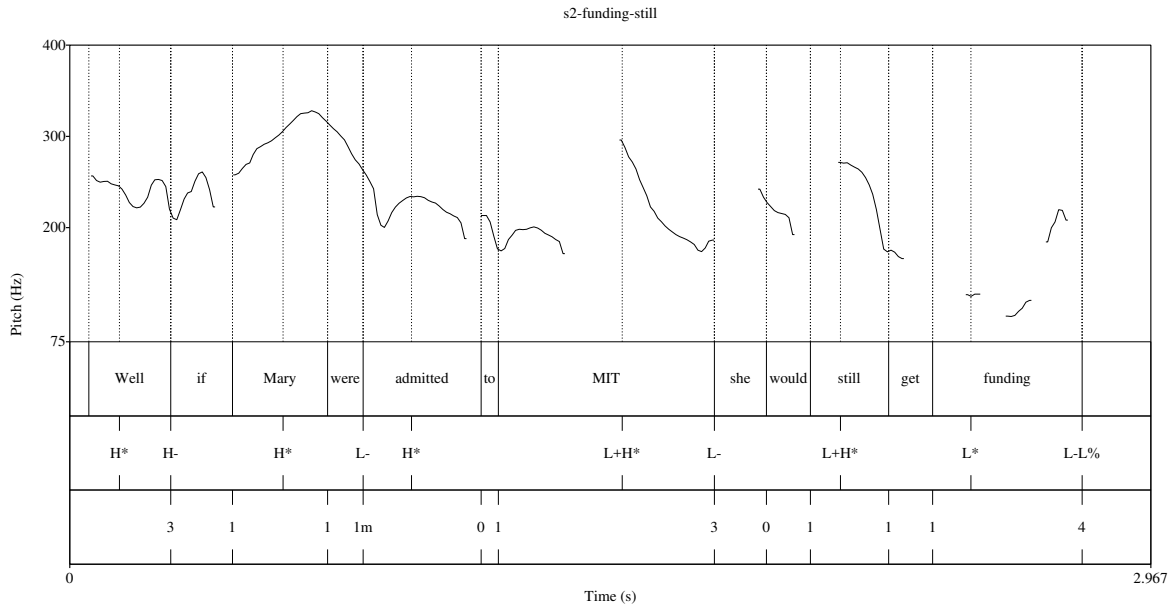
(a) Speaker s1, (A9), *still*



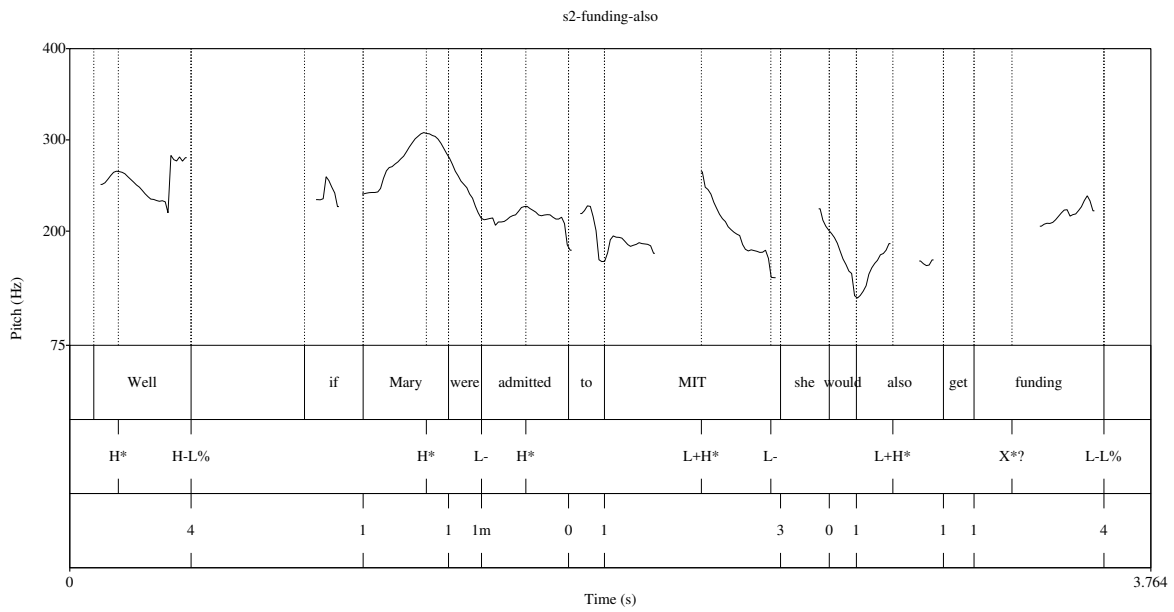
(b) Speaker s1, (A9), *also*

Figure 10. Speaker s1, sentence (A9).





(a) Speaker s2, (A9), *still*



(b) Speaker s2, (A9), *also*

Figure 11. Speaker s2, sentence (A9).

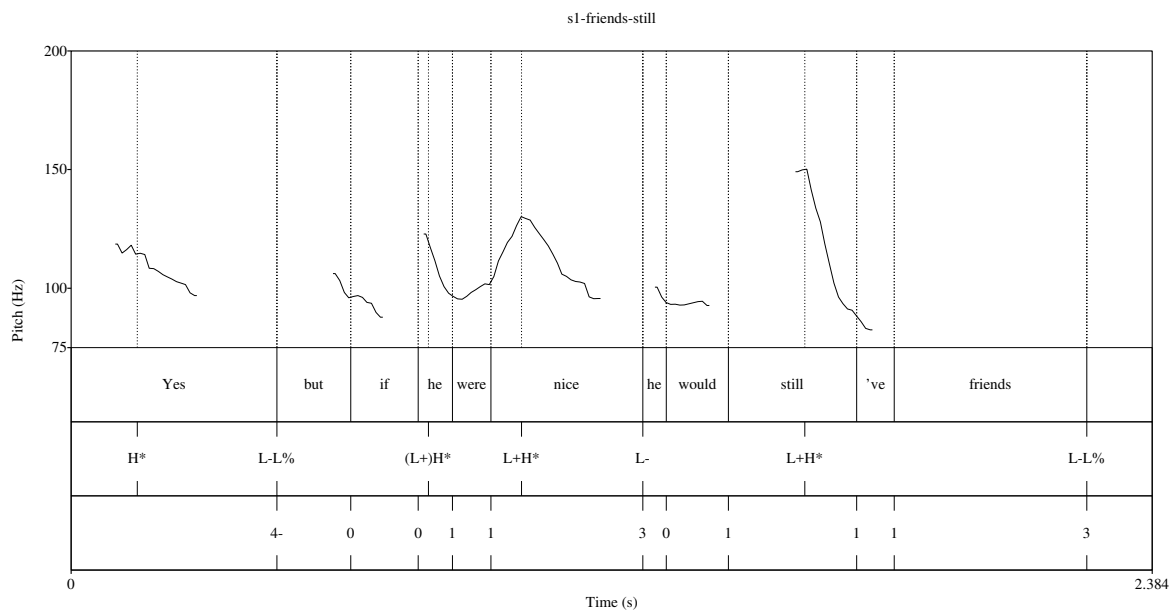
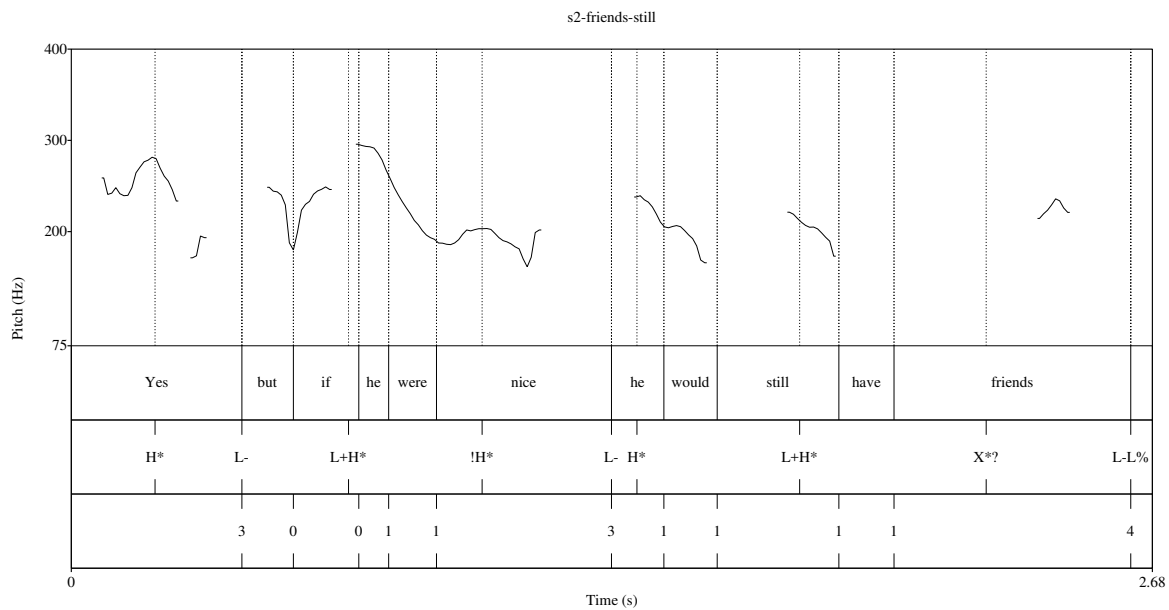
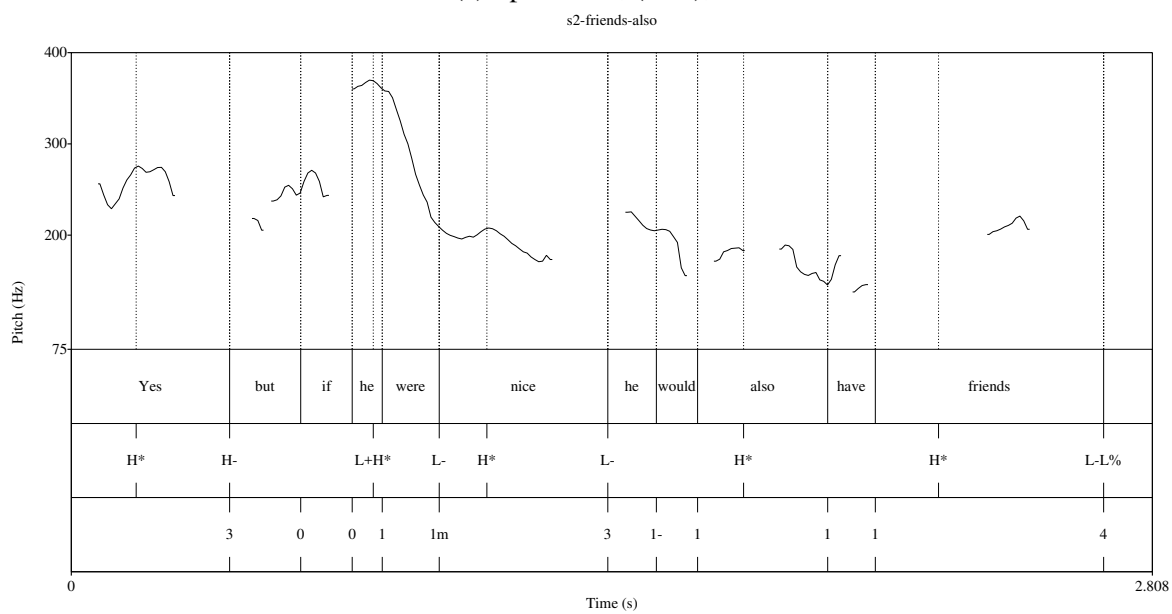


Figure 12. Speaker s1, sentence (A10), *still*.



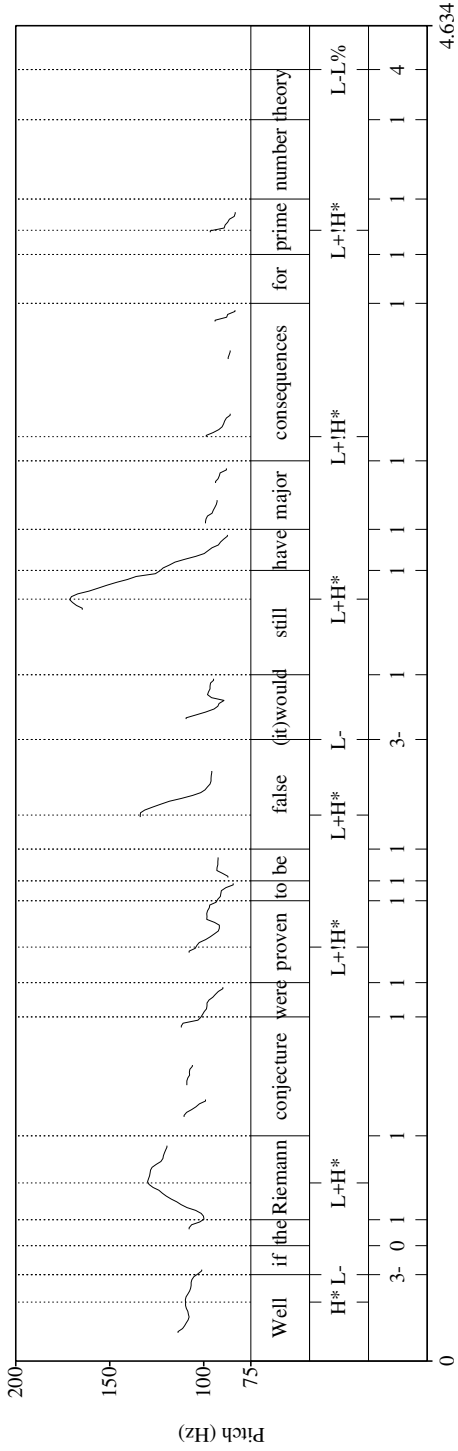
(a) Speaker s2, (A10), *still*



(b) Speaker s2, (A10), *also*

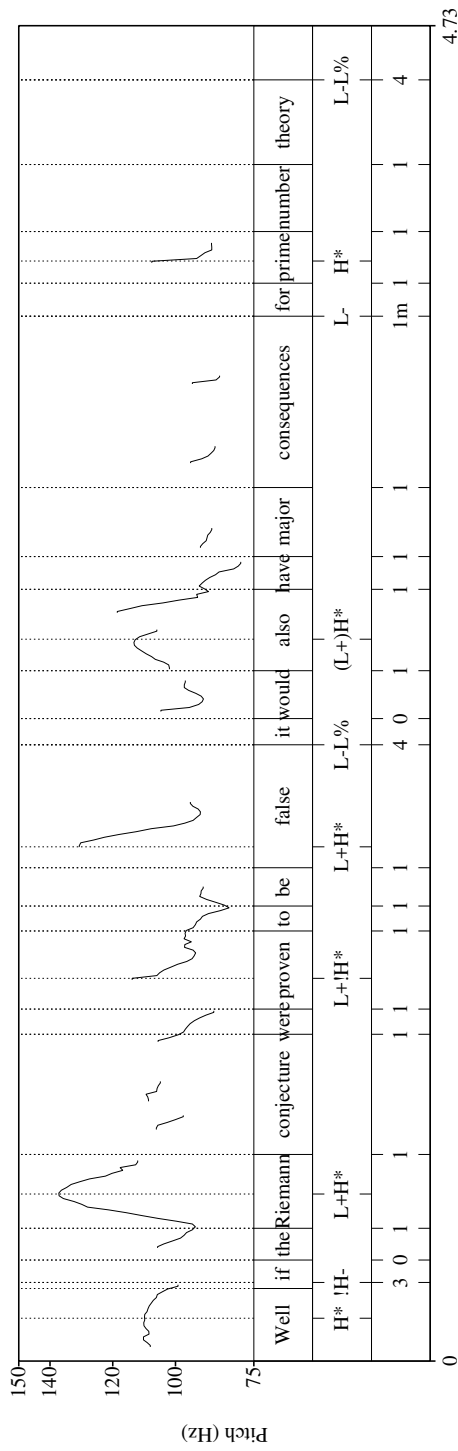
Figure 13. Speaker s2, sentence (A10).

s1-riemann-still



(a) Speaker s1, (A11), still

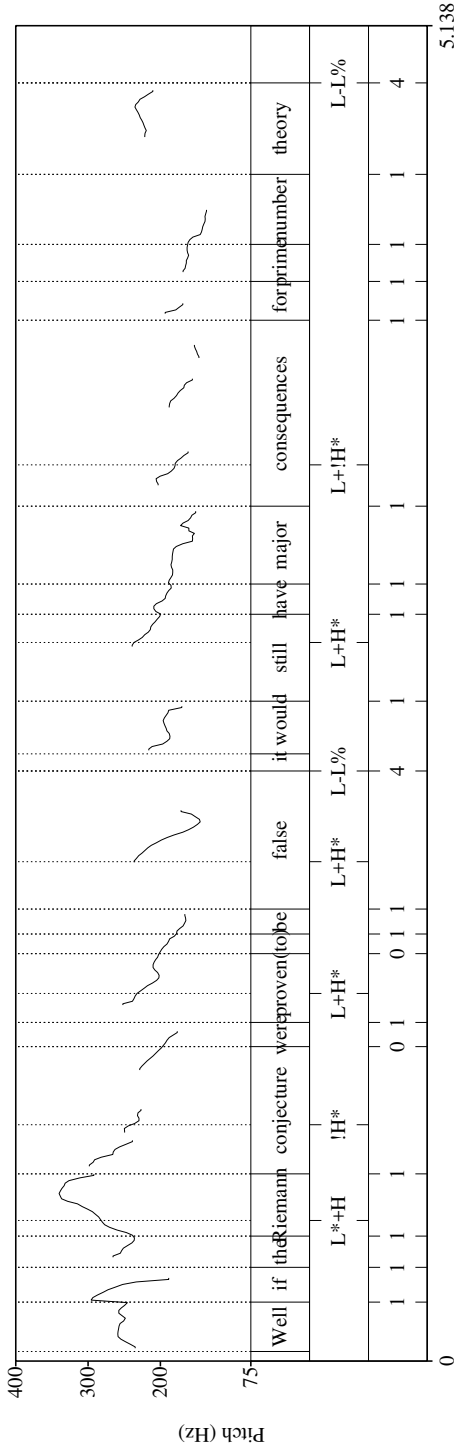
s1-riemann-also



(b) Speaker s1, (A11), also

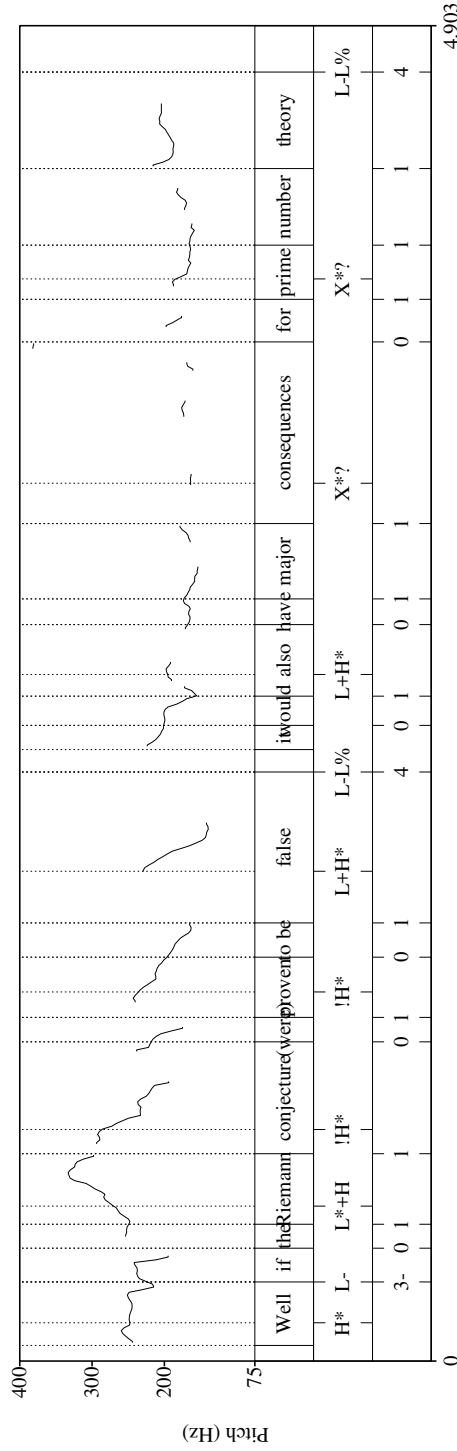
Figure 14. Speaker s1, (A11).

s2-Riemann-still



(a) Speaker s2, (A11), still

s2-Riemann-also



(b) Speaker s2, (A11), also

Figure 15. Speaker s2, (A11).



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