

# Focus on Conditional Conjunction

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Certain conjunctions convey the meaning of a conditional. For instance, the sentence in (1a), which has the form of a simple conjunction, means roughly the same thing as the sentence in (1b), which has the form of an *if*-conditional:

- (1) a. You eat too many carrots and your skin will turn orange.
- b. If you eat too many carrots, your skin will turn orange.

Because of their conditional meanings, these conjunctions are called conditional conjunctions (CCs)<sup>1</sup>. This paper presents new empirical data suggesting that the main operator of a CC is a modal in the second clause. The modal in (1a), for instance, is *will*. An analysis is offered in which this modal raises at LF to a position above the conjunction. The paper also presents evidence that CCs require a unique pronunciation and have a different focus structure from other conjunctions. This focus structure, it is argued, allows the meaning of the first clause of the conjunction to form the restriction of the main modal operator, thus giving the sentence a conditional meaning.

The paper is organized as follows: Section 1 teases apart the CC data from several related phenomena and provides a few more examples of the construction. Section 2 presents several previous analyses of CCs from the literature. Next, Section 3 presents the new empirical data and makes the case for the new analysis argued for in this paper. Section 4 examines the syntactic ramifications of this proposal. Last, Section 5 looks at why CCs are more restricted than normal conjunctions, and Section 6 concludes the article and discusses one possible extension of the analysis.

## 1 Conditional Conjunctions and their Cousins

Before delving into full CCs themselves, I will first discuss a few similar types of sentences which have been discussed more extensively in the literature. The first mention of a full CC like the sentence in (1a) comes in Bolinger (1967), but related phenomena were noticed as far back as Jespersen (1909), who describes a few similar constructions in Part V of his monumental work *A Modern English Grammar on Historical Principles*.<sup>2</sup> In the course of this section, I will argue that two of these constructions are subcases of the CC construction and two others are slightly different constructions. In the last part of this section, I will present the full CC construction.

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<sup>1</sup>This term was coined by Russell (2007).

<sup>2</sup>Part V was published in 1940. Jespersen (1924) also describes a construction very similar to the ‘pseudo-imperative’ constructions given in Jespersen (1909).

## 1.1 OM-sentences

In his section on conditionals, Jespersen (1909) notes that the conjunction of a noun phrase with a full sentence can have a conditional meaning. Among others, he presents the sentences in (2), which can have the conditional meanings given in (3):

- (2) a. One more word of your sauce, and I'll call you down and fight you.  
(Stevenson 1898, p. 108)
- b. A few days more of this and I'll go mad. (Locke 1919, p. 128)
- (3) a. If you give me one more word of your sauce, I'll call you down and  
      fight you.
- b. If there are a few days more of this, I'll go mad.

Culicover (1970, 1972) calls examples like this “OM-sentences” since they often begin with the phrase *one more*. He concludes that there is a special rule of interpretation stating that in a sentence of the form *NP and S*, the *NP* is linked with the antecedent of a conditional meaning and the *S* with its consequent. Culicover and Jackendoff (1997) expand on this analysis to cover cases with two conjoined sentences. It is beyond the scope of this paper to speculate about how the DPs in (2) come to have propositional meanings (and perhaps clausal syntax, too). However, once this is explained, these sentences should fit in with the proposal given below for full CCs.

## 1.2 IaDs

The second atypical conditional construction that Jespersen (1909) describes involves conjoined sentences whose first conjunct appears to be an imperative. Among others, he presents the sentences in (4), which can have the conditional meanings given in (5):

- (4) a. Take honor from me, and my life is done.  
(Shakespeare 1836, p. 365)
- b. [Take care how you carry that box, Caleb.] Let it fall and I'll murder  
      you! (Dickens 1893, p. 32)
- (5) a. If you take honor from me, my life is done.
- b. If you let it fall, I'll murder you.

Jespersen calls these pseudo-imperatives, a term which is adopted by Culicover (1972) and Franke (2005), among others.<sup>3</sup> For the rest of the paper, though, I will adopt the (shorter) term IaD (for “imperative *and* declarative”) coined by Schwager (2005). This second observation of Jespersen’s inspired much more research, including works by Bolinger (1967), Davies (1979, 1986), van der Auwera (1986), Hamblin (1987), Han (2000), Franke (2005), Schwager (2005), and Russell (2007).

These researchers have varying opinions on whether the imperatives in (4) are “real” imperatives or not. Although for the most part, this question is orthogonal to the topic of this paper, I am sympathetic to the line pursued

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<sup>3</sup>Jespersen actually uses the term *pseudo-imperative* more broadly to indicate any non-canonical use of an imperative. In following works (and this one), the term refers simply to uses of imperatives in compound sentences with conditional meanings.

in Krifka (2004a,b), in which the morphological “imperative” form is allowed to appear in syntactic environments other than the canonical one in which it conveys a command or request. Under this view, the CC could simply be another environment where this form may appear, even though in the CC it does not necessarily carry the same meaning or discourse use as a normal imperative. Once again, it is beyond the scope of the current paper to make this proposal precise. However, once the imperative sentences above are given propositional meanings, the IaDs will also be explained by my analysis below.

### 1.3 Conditional Disjunctions

Jespersen (1909) also notices a conditional flavor to some disjunctions, which I will call conditional disjunctions (CDs). For instance, he discusses (6a), which has a meaning somewhat like (6b):

- (6) a. We must go now, or we shall be late for tea. (Bennett 1910, p. 19)  
 b. If we don’t go now, we shall be late for tea.

Culicover and Jackendoff (1997), Schwager (2005), and Russell (2007), among others, all discuss this type of construction and conclude that CDs differ from CCs in a few major ways. One of these has to do with imperatives. An imperative in a CC is truly divorced of its directive force, as shown in (7):

- (7) a. Open the Guardian and you’ll find three misprints on every page.  
 (Clark (1993)’s (4))  
 b. Eat too much candy and you get a stomach ache. (Bolinger 1967)

In (7a), the speaker is not literally asking the hearer to open a newspaper, and in (7b) the speaker pretty clearly does not want the hearer to eat too much candy. The imperative in a CD, on the other hand, seems to retain some of its directive force:

- (8) a. Leave now or I’ll make you a nice dinner. (Clark’s 40)  
 b. ≠ If you don’t leave now, I’ll make you a nice dinner.

This force is shown by the fact that (8a) can only be uttered in a scenario where the speaker wants the addressee to leave.

A second major difference between CDs and CCs is revealed when there is a modal embedded in the first clause. In a CC, any modal in the first clause is interpreted below the conditional.<sup>4</sup> However, a modal in the first clause of a CD seems to be outside the scope of the conditional, as shown in (9):

- (9) a. You should sit down or I’ll call the police.  
 (Culicover and Jackendoff (1997)’s (55b))  
 b. ≠ If you shouldn’t sit down, I’ll call the police.  
 c. ≈ You should sit down. If you don’t sit down, I’ll call the police.

Here, the best paraphrase of (9a) puts the modal *should* in a separate sentence entirely from the conditional. This matches much more closely the type of

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<sup>4</sup>See section 1.4 for more discussion of cases with a modal in the first clause of a conjunction.

paraphrase found in modal subordination contexts (Roberts 1987).<sup>5</sup> Based on this evidence, like these authors before me, I will assume that CDs are a different kind of construction than CCs.

## 1.4 Sufficiency Modal Conjunctions

Schwager (2005) notes that the following apparent CC contains a modal in the first clause which seems to take scope over the whole sentence:

(10) You only have to tell me once and I'll never forget.

Sentence (10) is an example of what von Stechow and Iatridou (2007) call the sufficiency modal construction (SMC). At first glance, SMCs of the form in (10) appear quite similar to CCs. Like a CC, and unlike a normal conjunction, neither of the clauses of (10) need to represent actual events in order for the whole sentence to be true. Rather, the sentence seems to indicate some correlation or tendency, like a conditional does.

However, this is where the comparison starts to break down. Unlike a CC, (10) cannot be paraphrased by putting the whole first clause into an *if*-clause, as shown in (11):

(11) If you only have to tell me once, I'll never forget.  $\neq$  (10)

As mentioned before, other CCs, even when they have a modal in the first clause, are paraphraseable thus. For instance, the CC in (12a) contains a modal (*have to*) in its first clause, and yet it still receives a paraphrase, as in (12b), where this modal is inside of an *if*-clause:

(12) a. You have to do your laundry and the whole morning is shot.  
b. = If you have to do your laundry the whole morning is shot.

Last, and most tellingly, (10) does not have the same pronunciation as other CCs. I will argue in section 3.2 below that CCs have a distinctive stress pattern: the first clause exhibits the B-accent of Jackendoff (1972) and an intonational break separates the two clauses. There is stress on the first clause of an SMC conjunction, but it is not the same fall-rise pattern of the B-accent, and there does not have to be an intonational break between the clauses.

This different pronunciation can be shown most easily with the following minimal pair. First, imagine a child is being punished and has to stay home either until dinner or until she has done one hour of homework (no matter how much homework she has in total). In setting this punishment, the parent might utter the following SMC:

(13) You only have to do one hour of work and (then) you can leave the house before dinner. ( $\neq$  If you only have to do one hour of work, you can leave the house before dinner.)

The modal *have to* is the main operator of the sentence, because the effect of the sentence as a whole is to set up the punishment – i.e. what the kid has to do. In this scenario, the pronunciation of the sentence does not match that of a CC and it is not paraphraseable with an *if*-clause like a CC.

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<sup>5</sup>See section 2.2 for more on modal subordination and conditional coordinations.

Next, imagine instead that two friends are talking on the phone and one invites the other out. The invitee declines because she has to do some homework, but the inviter is persistent, asking how much homework the invitee has. The inviter theorizes that if this amount is minimal enough, the invitee could still go out for dinner. This theory could be phrased in terms of the following CC:

- (14) You only have to do one hour of work and (#then) you can leave the house before dinner. (= If you only have to do one hour of work, you can leave the house before dinner.)

Although this sentence is written exactly the same as the SMC above, it is pronounced quite differently, having the canonical fall-rise of the B-accent on the first clause and a break before the second clause. When thus pronounced, the sentence has the usual paraphrase of a CC, too. The fact that we can turn an SMC sentence in a CC by changing its pronunciation shows that the two types of sentences are different from one another.<sup>6</sup>

## 1.5 Full Conditional Conjunctions

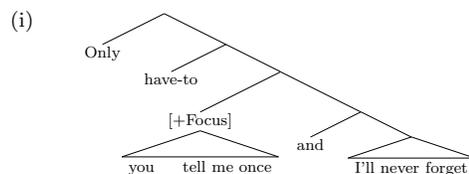
Now that we have explored the related phenomena, let us return to the main focus of the paper, full CCs. Bolinger (1967) gives the following examples:<sup>7</sup>

- (15) a. A fellow gets a few gray hairs and they think he's ready for the ashheap.  
 b. Macy's advertises a sale and the whole town goes crazy.

These sentences are arguably generics: (15a) describes what happens when a generic *fellow* gets old; (15b) describes what generally happens when Macy's has a sale. Bolinger goes on to point out that this construction is particularly amenable to use of impersonal *you*, a pronoun often employed in generic sentences. He gives the following examples:

- (16) a. You try to please somebody and all you get is a kick in the pants.

<sup>6</sup>My hypothesis about SMCs is that they have the following structure:



In a way, they are the mirror opposite of a CC: the modal that scopes over the entire structure comes from the first clause instead of the second, and the focus also falls on the first clause instead of the second. Given the same assumptions about focus interpretation that I will make below, the sentence will have the meaning schematized in (ii). And following von Stechow and Iatridou's meanings for *only* and *have to*, this meaning can be paraphrased as in (iii):

- (ii) Only have-to  $\begin{bmatrix} \textit{Restriction} & \text{something happens and I'll never forget} \\ \textit{Nuclear Scope} & \text{you tell me once and I'll never forget} \end{bmatrix}$
- (iii) There is a (future) scenario in which I never forget such that you don't do anything but tell me once and I never forget.

<sup>7</sup>All of these sentences from Bolinger (1967) are on page 340.

- b. You have half a degree of temperature and they put you to bed; you look a little pale around the gills and they act like it's time to call a priest.
- c. You tell him anything and he just looks at you blankly.

However, not all of Bolinger's examples with *you* are cases of impersonal *you*. He also gives the following sentence, for instance:

(17) A telegram comes and you're sure it's bad news.

This sentence could be used generically, for instance to describe the state of mind of a generic person who is in a pessimistic mood; however, it could also be used to describe the state of mind of the addressee, if he or she has just received a telegram and assumed it was bad news. Other more specific examples of CCs abound:

- (18) a. You take one more step and I'll shoot.
- b. John comes home one minute past curfew and he'll be grounded for life.
- c. Big Louie sees you with the loot and he puts out a contract on you. (Culicover and Jackendoff (1997)'s (3b))

It seems that (in English, at least) both specific and generic sentences may be CCs.

As evidenced by the sentences presented so far, CCs usually involve eventive verbs, but cases with statives also exist:

- (19) a. A guy owns a Ferrari and he's going to rack up a few speeding tickets.
- b. Bill comes home early and you'll have a big problem on your hands.

(19a) has a stative in the first conjunct and (19b) has one in the second. Also, although CCs usually involve direct causation, cases with statives show some flexibility in this regard, as shown in (20):

(20) Something happens in this town and John knows about it.

(20) does not mean that if something happens in this town, the very fact that it happens directly causes John to know about it. Rather, it means that if something happens in this town, John indirectly comes to know about it.

There are additional interesting facts about the distribution of CCs and their interaction with other linguistic phenomena. For instance, the tenses found in CCs are limited, as are the modals available to CCs. However, for ease of exposition, I will leave the discussion of these facts to later sections, where this data can be presented along with its analysis.

## 2 Previous Analyses

Having narrowed down exactly what a CC is and is not, we now turn to the analyses of CCs in the literature. The only major analysis of full CCs is due to Culicover and Jackendoff (1997), but many authors have analyzed of IaDs. Since

I believe IaDs are special cases of CCs, I will present a few of these analyses here as well.

## 2.1 Separation of Syntax and Semantics

As mentioned above, the first discussion of full CCs is in Bolinger (1967). Although he discusses these cases, Bolinger’s main concern is analyzing imperatives, and therefore the first analysis of full CCs comes in Culicover and Jackendoff (1997), who build on the analysis of OM-sentences presented in Culicover (1972). Culicover and Jackendoff (henceforth C&J) argue elsewhere (Culicover and Jackendoff 1995) that besides syntactic structure (SS), there is also a completely computational semantic system, which they call conceptual structure (CS). Under this theory, it stands to reason that there should be some mismatches where similar syntactic structures are mapped onto two different conceptual structures. Conjunctions, according to C&J, are a perfect case in point. To explain the difference between a standard conjunction and a CC, they posit two homophonous words pronounced *and*. The first, which they call  $and_C$  (“coordinating *and*”), has the standard, conjunctive meaning of *and*. However, the second, which they call  $and_{LS}$  (“left-subordinating *and*”), carries a different meaning; although an exact semantics is not given, sentences of the form  $S_1 \text{ } and_{LS} \text{ } S_2$  are assumed to have the same semantics as sentences of the form *if*  $S_1$ , *then*  $S_2$ .

Since their claim is that CCs are syntactically like conjunctions and semantically like conditionals, C&J take great pains to tease apart the ways in which CCs act like conjunctions from the ways in which they act like conditionals. The theory is that those phenomena which group CCs with conjunctions must be the result of constraints holding at SS while those phenomena which group CCs with conditionals must be the result of constraints at CS.

The first syntactic phenomena that C&J examine involve the position of  $and_{LS}$  in the sentence. As shown in (21a), English subordinating conjunctions always appear directly to the left of a subordinate clause. In contrast, the *and* in a CC appears to the right of the first clause (which C&J call the subordinate clause), as shown in (21b):

- (21) a. [After/before/since/when/until/if/unless/though/although/because you eat too many carrots], you will turn orange.  
 b. [You eat too many carrots and]<sup>?</sup> you will turn orange.

C&J also note that while most subordinate clauses can appear to the left (as shown in (21a)) or the right of a sentence (as shown in (22a)), the order of a CC is fixed. There would theoretically be two ways to shift the order of a CC. First, if the *and* is assumed to be a right-attached subordinating conjunction and the entire first clause (including *and*) is moved to the right, the result is gibberish (as shown in (22b)). Second, if the two clauses are simply transposed, the result lacks a conditional reading (as shown in (22c)):

- (22) a. You will turn orange [after/before/since/when/until/if/unless/though/although/because you eat too many carrots].  
 b. \*You will turn orange [you eat too many carrots and]  
 c. You will turn orange and you eat too many carrots. (No CC reading)

Based on this and other evidence, C&J conclude that the *and* in CCs is syntactically a coordinating conjunction, not a subordinating conjunction. I concur with this conclusion.

The second part of C&J's argument is that certain, purely semantic phenomena group together CCs and *if*-conditionals, rather than CCs and other conjunctions. They point out that CCs pattern with *if*-conditionals in allowing negative polarity items (NPIs) in the clause acting as the semantic antecedent of the conditional, as shown in (23a). *If*-conditionals allow NPIs in their antecedent clauses as well (see (23b)), but normal conjunctions do not allow NPIs (see (23c)):

- (23) a. You *ever* do that again, and I will report you.  
 b. If you *ever* do that again, I will report you.  
 c. \*You *ever* did that again, and I reported you.<sup>8</sup>

The other semantic phenomena C&J cite in this argument involves binding and extraction facts. For instance, they point out that under the right conditions a quantifier in the second clause of a CC may bind a pronoun in the first, as shown in (24a) and (24b). These data are paralleled by similar cases of *if*-conditionals (as in (24c)), but not by other conjunctions (as in (24d)).

- (24) (C&J 23)  
 a. You give him enough opportunity and every senator, no matter how honest, will succumb to corruption.  
 b. You put enough pressure on him to vote against health care reform and every senator, no matter how committed, will side with business interests in the end.  
 c. If you give him enough opportunity, every senator, no matter how honest, will succumb to corruption.  
 d. \*We gave him enough opportunity and every senator, no matter how honest, succumbed to corruption.

Extraction is also possible, although awkward, from either clause of a CC:<sup>9</sup>

- (25) a. That is one rock star that I see another cover story about *t* and I'll scream. (C&J's (33a))  
 b. ?This is one country that you train enough troops and you can conquer *t*.  
 (26) a. ?Who do you think John mentions *t* and Sue immediately kicks him out?

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<sup>8</sup>C&J use simple past tense to induce a coordinating interpretation, since it usually precludes a conditional interpretation.

<sup>9</sup>This is not technically an argument that CCs pattern with *if*-conditionals, since, as shown in (i), *if*-conditionals do not support this kind of extraction:

- (i) a. \*That is one rock star that if I see another cover story about, I'll scream.  
 b. \*This is one country that if you train enough troops, you can conquer.  
 c. \*Who do you think if John mentions, Sue immediately kicks him out?  
 d. \*Which country do you think if you train enough troops, you can conquer?

However, the data do support C&J's point that the CSC (see below) is a semantic constraint and not a syntactic one.

- b. ?Which country do you think you train enough troops and you can conquer *t*?

The (a) examples above show extraction from the first clause of a CC and the (b) examples show extraction from the second clause. These data are puzzling because, assuming that the cases in (24) involve QR of *every senator* to a position outside the conjunction, they all involve movement out of only one conjunct of a conjunction, in apparent violation of the Coordinate Structure Constraint due to Ross (1967):

- (27) Coordinate Structure Constraint (CSC): extraction from a coordinated structure requires across-the-board movement.

However, as C&J point out, linguists started finding exceptions to the CSC literally as soon as it was proposed. (Ross himself gives several exceptions.) I will not argue against the strong form of the CSC, since so many others have done so very well.<sup>10</sup> Instead, I will grant C&J that CCs fall into one of the many exceptions to this constraint.

It is beyond the scope of this article to speculate on the precise (re-)formulation of the CSC to capture all its various exceptions, but it is uncontroversial to assume that it has at least some semantic component to it. It is also unremarkable to claim that NPIs are licensed via a semantic constraint<sup>11</sup>. Therefore, since a CC has a very different meaning from a normal conjunction, it is not surprising, under any analysis, that CCs will pattern differently from normal conjunctions with respect to these two constraints. These data can easily be captured in a system where the semantics is not another fully generative system. Therefore, this data alone does not seem like a sufficient reason to assume the sort of mismatch between syntax and semantics that Culicover and Jackendoff (1997) assume.

In the end, C&J offer a very careful empirical study of CCs and their grammatical restrictions, and researchers such as Franke (2005) have built fuller theories based on theirs. However, this paper will pursue an analysis of these phenomena within a system where the semantics of a sentence is calculated based on the application of fixed rules of interpretation to the Logical Form (LF) output by the fully computational syntactic system. Although I agree with C&J that certain of the binding and NPI facts that they cite require “more semantic” explanations, I do not think that this argues for a truly separate, computational semantic system, especially if it requires two homophonous words *and* – an unparsimonious choice. The system proposed in this paper will work within standard theories of syntax and semantics, without requiring any extra machinery or unusual definitions of the word *and*. This approach will also correctly predict several empirical facts that C&J’s proposal does not capture.

## 2.2 Modal Subordination

Most of the remaining proposals in the literature only attempt to account for IaDs – CCs where the first clause is (at least formally) an imperative. Although

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<sup>10</sup>For a summary of work on the CSC and a convincing proposal to replace it, I direct readers to Kehler (2002), Chapter 5.

<sup>11</sup>See Section 3.4 for discussion of NPIs.

IaDs are not the focus of this paper, these proposals are nonetheless instructive to examine, since they bear on the topic of CCs as a whole.

Two such proposals are made in Han (2000) and Russell (2007). Although they disagree on exactly which cases are truly imperatives, both Han and Russell propose that the second clause of an IaD contains a modal whose restriction is provided via modal subordination (Roberts 1987, 1989), a phenomenon wherein a proposition mentioned in a discourse becomes the restriction of a modal used later in the discourse. Consider, for instance, the following sentences and paraphrases:

- (28) a. Come any closer and I'll shoot.
- b. In the worlds where you come any closer, I'll shoot.
- (29) a. Everyone shut up and I'll tell you who Renick is. (Russell's (67a))
- b. Everyone shut up. In the worlds where everyone shuts up, I'll tell you who Renick is.

For Han, the imperative in an IaD makes no assertion or command; it merely makes a proposition available for later use in modal subordination. Therefore, a sentence like (28a) comes to mean something like (28b), where the first clause is not asserted or used in a command at all. Russell, on the other hand, claims that sentences like (28a), where the first clause is not a good imperative on its own, do not actually contain an imperative. He makes no attempt to analyze these sentences further, instead discussing cases like (29). He claims that sentences like (29a) can be analyzed as the speech-act conjunction (Krifka 2001) of a true imperative and a true declarative modal sentence, where the modal is restricted by the propositional content of the imperative. This meaning is paraphraseable as in (29b), where the conjunction has simply been removed.

This whole approach has been called into question by von Stechow and Iatridou (2009), who point out three ways in which this apparent modal subordination inside of speech-act conjunction (with an explicit *and*) behaves differently from modal subordination in speech-act sequencing (without an *and*). First, von Stechow and Iatridou (henceforth vF&I) note that modal subordination can target both imperatives and universal modals in speech-act sequencing. For instance, the modal subordination example in (30a) involves two separate sentences, the first of which is an imperative. This sequence of sentences means roughly the same thing as the sequence in (30b), which involves two sentences as well, but uses a universal modal instead of an imperative in the first sentences. The situation is different for actual conjunction, though, as shown in (31). While (31a) – which has an imperative in the first clause – has a perfectly sensible conditional (CC) reading, the same is not true of (31b), which has a universal modal in the first clause. (Notice that the CC in (30a) can even be followed up by a statement like “But I don't think you should,” which would be quite strange after (30b).)

- (30)  $\approx$  vF&I's (23)
  - a. Invest in this company! You'll get filthy rich (as a result).
  - b. = You must/have to/should invest in this company. You'll get filthy rich.
- (31)  $\approx$  vF&I's (21)

- a. Invest in this company and you'll get filthy rich.
- b. ≠You must/have to/should invest in this company and you'll get filthy rich. (No conditional reading)

Second, although modal subordination in speech-act sequencing can lead to a phenomenon known as polarity shift, this effect is not observed in IaDs. For instance, the discourse in (32a) means approximately the same thing as (32b), where the positive version of the (negated) first sentence restricts the modal in the second. This contrasts with (33a), where the same shift does not occur.

- (32) vF&I's (26a)
- a. Don't park there. You will be towed.
  - b. = Don't park there. If you do park there, you will be towed.

- (33) vF&I's (27a)
- a. Don't park there and you will be towed.
  - b. ≠ Don't park there. If you do park there, you will be towed.

Last, although speech-act sequencing allows modal subordination with either the modal *will* or the modal *would* (as shown in (34)), IaDs do not allow *would* (as shown in (35)):

- (34) vF&I's (30-31)
- a. Read that book by Max. You will like it.
  - b. Read that book by Max. You would like it.

- (35) vF&I's (34-35)
- a. Study hard and you will pass the class.
  - b. \*Study hard and you would pass the class.

Therefore, vF&I conclude that IaDs do not in fact involve modal subordination.

With regards to full CCs, I should note that at least vF&I's last two observations carry over to CCs with two declarative sentences as well.<sup>12</sup> Consider, for instance, the following sentences:

- (36) a. You don't pay your taxes and you'll be arrested.  
 b. ≠ You don't/won't pay your taxes. If you do pay them, you'll be arrested.
- (37) \*You eat too many carrots, and you would turn orange.

As shown in (36), full CCs do not exhibit polarity shift any more than IaDs do. Also, the attempted CC in (37) with *would* in the second conjunct is not grammatical. Therefore, even in the unlikely event that the modal subordination analysis could be extended to CCs with two declarative sentences, vF&I's arguments would apply just the same. Therefore, I will not pursue the modal subordination account any further.

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<sup>12</sup>The first observation does not really apply to full CCs, since declarative sentences – unlike imperative sentences – are not always easily paraphrased using a universal modal.

### 2.3 Focus Accounts

Krifka (2004a,b) points out that CCs have a distinctive pronunciation, which he reports as the deaccenting of the first clause. A long line of researchers (Halliday 1967, Jackendoff 1972, Rooth 1985, 1992, among others) has held that focus structure can shape the meanings of modals. In particular, unfocussed material (which is often deaccented) can join the restriction of a modal. Krifka proposes that the modal in a CC is always a generic operator.<sup>13</sup> The first clause of the CC, being deaccented and therefore unfocussed, joins the restriction of this generic operator. Hence, the meaning of a sentence like (1a), repeated as (38a), can be represented as (38b), where  $GEN_s$  is a generic operator quantifying over situations  $s$ :

- (38) a. You eat too many carrots and your skin will turn orange.  
 b.  $GEN_s$  [ $Restriction$  you eat too many carrots in  $s$ ]  
           [ $Nuclear\ Scope$  your skin turns orange in  $s$ ]

Schwager (2005) makes use of this idea that the focus structure of a CC determines its meaning, but she does not agree that the modal involved is always the generic operator. Schwager points out that certain IaDs, such as the following, do not have generic meanings:

- (39) Drink one more beer and I'll leave. (Schwager's (40), p. 256)

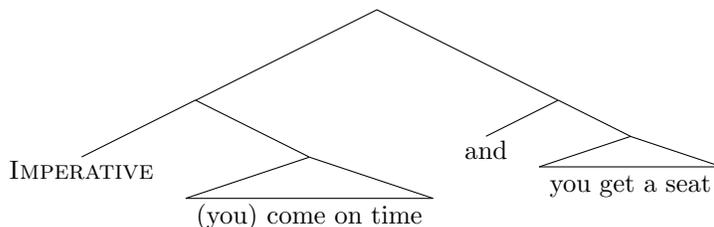
Earlier in her dissertation, Schwager (2005) proposes a modal meaning for imperatives, and she points out that this modal can be restricted by other material in the sentence. For instance, in (40), the imperative only takes force in worlds where the condition in the *if*-clause is met:

- (40) If you run into Adrian, tell him about the submission deadline. (Schwager's (44), p. 258)

Schwager builds on this idea and proposes the structure in (42) for the sentence in (41) (where IMPERATIVE is the imperative modal):

- (41) Come on time and you'll get a seat. ( $\approx$  Schwager's (49a), p. 259)

(42)



In an IaD, IMPERATIVE simply acts as a universal modal, without contributing any directive force. The first conjunct is unfocussed and therefore is mapped onto the restriction of the modal. (In her system, this is reflected by a syntactic movement to join a syntactic variable representing the modal base.) Thus, the structure in (42) comes to mean *in all situations where you come on time, you*

<sup>13</sup>This proposal is very similar to one mentioned on page 205 of Culicover and Jackendoff (1997). C&J discard the proposal, as Schwager does, because of examples where the modal in a CC does not seem to be generic.

*get a seat.*

My proposal below will maintain the idea that the focus structure of CCs maps part of the sentence onto the restriction of a modal. The difference will come in which modal is thus restricted. As Schwager and C&J point out, the modal cannot always be a generic operator. Nor, in the general case, can it be an imperative modal, since many CCs do not contain imperatives. Therefore, Schwager’s analysis will not be suitable to analyze all CCs. Even when restricted just to IaDs, though, her proposal cannot handle cases like the following:

- (43) a. Come on time, and you’ll usually get a seat.  
b. In most situations where you come on time, you get a seat.

- (44) Usually  $\left[ \begin{array}{l} \textit{Restriction} \\ \textit{Nuclear Scope} \end{array} \right. \begin{array}{l} \text{(you) come on time} \\ \text{you get a seat} \end{array}$

(43a) is best paraphrased as (43b). I will argue below that, as suggested by this paraphrase, (43a) conveys a (semantic) structure like (44), where the modal adverb *usually* takes scope over the entire sentence. The first clause serves as the restriction of this modal adverb, and the second clause serves as the nuclear scope. There is no indication that the imperative adds any modality to the meaning.

Schwager’s analysis, on the other hand, would put the modal adverb inside the nuclear scope of her IMPERATIVE modal. This would yield an odd reading, in which every situation where you come on time is a situation where you usually get a seat. This is odd in the same way the sentence *I usually got a seat at the talk last night* is odd: we are only talking about a single occasion and yet we are using *usually* to describe it.<sup>14</sup> Based on data such as this, the analysis below will assume that the main modal of a CC comes from the second clause.

### 3 Analysis

This section will present the semantic details of my analysis of CCs. I will first examine the role of the modal<sup>15</sup> in the construction, followed by the role of focus, and then put the two together to finish the analysis. Last, a few details of the analysis will be analyzed further. A fuller discussion of the syntax involved in CCs will be presented in section 4.

#### 3.1 The Modal

Before discussing the modal in a CC, let us first examine a widely accepted analysis of *if*-conditionals propounded by Lewis (1975), Heim (1982), and Kratzer (1991). In this system, the meaning of a modal has three parts. First, the *restriction* of the modal determines a set of possible worlds or situations which are being quantified over. Second, the *nuclear scope* of the modal determines a condition which holds of some portion of the situations determined by the restriction. Third, the modal itself determines what proportion this is. The analysis holds that the *if*-clause combines with a modal in the consequent,

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<sup>14</sup>Even if Schwager claimed that the adverb scoped above the entire structure, there would still be a problem: the sentence would quantify over all situations (ever), without a restriction.

<sup>15</sup>The word *modal* is used here in the semantic sense, which includes modal adverbs such as *always* and *probably* in addition to modal auxiliaries such as *will*.

forming the restriction of this modal. The remainder of the consequent forms the modal's nuclear scope. For instance, the *if*-conditionals in (45) have the semantic structures given in (46):

- (45) a. If you come on time, you always get a seat.  
 b. If you come on time, you usually get a seat.  
 c. If someone steals, they should be punished.  
 d. If you land on that space, you have to go to jail.
- (46) a. Always     [*Restriction*    you come on time]  
                   [*Nuclear Scope*  you get a seat]  
 b. Usually    [*Restriction*    you come on time]  
                   [*Nuclear Scope*  you get a seat]  
 c. Should     [*Restriction*    someone steals]  
                   [*Nuclear Scope*  they are punished]  
 d. Have-to    [*Restriction*    you land on that space]  
                   [*Nuclear Scope*  you go to jail]

In (46a) and (46b), the restriction determines that the situations being quantified over are those in which the addressee comes on time. The modal adverb *always* in (46a) requires that every situation in its restriction satisfy the condition in its nuclear scope. Therefore, (46a) means that every situation where you come on time is a situation where you get a seat. The modal adverb *usually* in (46b) only requires that most of the situations determined by the restriction satisfy the condition in the nuclear scope. Therefore, (46b) means that most situations where you come on time are situations where you get a seat.

When an *if*-conditional lacks an overt modal, the theory holds that there is a covert one, which means roughly the same thing as the overt modal adverb *generally*:

- (47) a. If you come on time, you get a seat.  
 b.  $\approx$  If you come on time, you generally get a seat.

The word *will* is also often considered a modal (Abusch 1988, 1997, Ogiwara 1989, 1996) with a meaning roughly as indicated by the paraphrase in (48c) of (48a):

- (48) a. If you come on time, you will get a seat.  
 b. Will    [*Restriction*    you come on time]  
                   [*Nuclear Scope*  you get a seat]  
 c. All future situations where you come on time are such that you get a seat.

Turning back to the topic at hand, the main new empirical observation of this paper is that this same pattern obtains in CCs. The CC sentences in (49) have the same semantic structures (shown in (50)) as their *if*-conditional counterparts:

- (49) a. You come on time, and you always get a seat.  
 b. You come on time, and you usually get a seat.  
 c. Someone steals, and they should be punished.  
 d. You land on that space, and you have to go to jail.

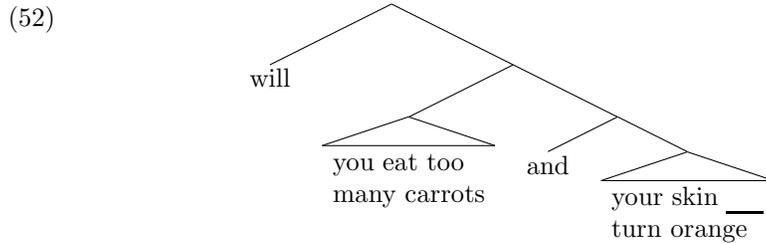
- e. You come on time, and you get a seat.  
 f. You come on time, and you will get a seat.
- (50)
- |    |           |                        |                         |
|----|-----------|------------------------|-------------------------|
| a. | Always    | [ <i>Restriction</i>   | you come on time]       |
|    |           | [ <i>Nuclear Scope</i> | you get a seat]         |
| b. | Usually   | [ <i>Restriction</i>   | you come on time]       |
|    |           | [ <i>Nuclear Scope</i> | you get a seat]         |
| c. | Should    | [ <i>Restriction</i>   | someone steals]         |
|    |           | [ <i>Nuclear Scope</i> | they are punished]      |
| d. | Have-to   | [ <i>Restriction</i>   | you land on that space] |
|    |           | [ <i>Nuclear Scope</i> | you go to jail]         |
| e. | Generally | [ <i>Restriction</i>   | you come on time]       |
|    |           | [ <i>Nuclear Scope</i> | you get a seat]         |
| f. | Will      | [ <i>Restriction</i>   | you come on time]       |
|    |           | [ <i>Nuclear Scope</i> | you get a seat]         |

So, (49a) means that every situation in which you come on time is a situation where you get a seat; (49d) means that in all situations consistent with the rules of the game where you land on that space are situations where you go to jail; and so forth for the rest of the sentences. Based on this evidence, I will conclude that, just as in *if*-conditionals, a modal in the second clause of a CC takes scope over the entire compound sentence.

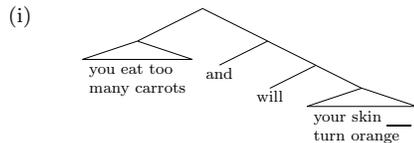
### 3.2 Focus Restriction

In a compositional analysis of CCs, in order for the modal from the second clause to take semantic scope over the whole sentence, it must take syntactic scope over the whole sentence.<sup>16</sup> The details of this syntactic structure will be examined in section 4, but for the time being, it will suffice to assume the structure sketched (52) for the CC in (1a), repeated in (51):

(51) You eat too many carrots and your skin will turn orange.



<sup>16</sup>Strictly speaking, this highest scope is not necessary to get a sensible meaning for the CC. The modal simply needs to take scope over the second clause:



However, this configuration does not lend itself to a simple analysis of the first clause: either the word *and* would have to have a construction-specific meaning like  $_{LS}$ and, or the first clause would need to lose its assertive power, as suggested, for instance, by Han (2000). The system proposed here will require neither of these assumptions.

One problem immediately arises: it seems reasonable to consider the entire conjunction below the modal as the modal's nuclear scope, but if we do so, the modal will have no restriction. In other words, as things stand, the sentence in (51) will have truth conditions paraphraseable as in (53):

- (53) All future situations are ones where you eat too many carrots and your skin turns orange.

These are clearly not the correct truth conditions, and so something must be done.

To solve this problem, I will capitalize on the observation by Krifka (2004a,b) that the pronunciation of CCs is somehow unique, although I do not agree, at least for English, with his characterization that the first clause of a CC is deaccented. There is stress on the first clause, but it is a particular type of stress: it sounds like the the B-accent of Jackendoff (1972), followed by an intonational break.

Jackendoff (1972) introduces the B-accent in the following way. He examines a situation where the question *Who ate what?* has been asked. He then considers the same sentence (*Fred ate the beans*) when it is a response to two different subquestions of this larger question, and he notices that the sentence differs in pronunciation in these two scenarios.

- (54) a. Well, what about FRED? What did HE eat?  
b. FRED ate the BEANS.
- (55) a. Well, what about the BEANS? Who ate THEM?  
b. FRED ate the BEANS.

When the sentence answers a question about Fred, as in (54), the word *Fred* receives a fall-rise intonation that Jackendoff dubs the B-accent and the word *beans* receives a simple falling intonation that he dubs the A-accent. These accents are reversed when the sentence is a response to a question about beans, as in (55). The A-accent has been theorized to mark focussed elements in a sentence, and the contribution of this focus has been widely studied (Rooth 1985, 1992, Büring 2003). The portion of the sentence marked with the B-accent, on the other hand, has been called the contrastive topic by Büring (2003), among others. The precise meaning signalled by the B-accent is a matter of debate, but one thing about it is clear: it marks a portion of the sentence that is not part of the focus. I capture this generalization with the following hypothesis:

- (56) The B-accent Is Not Focus (BIN-F) Hypothesis: Elements of a sentence pronounced with the B-accent are not part of the focus.

The utility of BIN-F will become clear once a fuller examination is made of the interaction between focus and quantifiers such as modals. Rooth (1985) discusses this interaction using sentences like the following (where all-caps represents A-accented, focussed material):

- (57) a. In St. Petersburg, AN OFFICER always escorts a ballerina.  
b. In St. Petersburg, an officer always escorts A BALLERINA.

Rooth points out that although these two sentences only differ in having different foci, they are nonetheless truth-conditionally distinct. (57a) means that

whenever someone escorts a ballerina, it is an officer escorting her and hence could be true even if officers also occasionally escort opera singers. (57b) means that whenever an officer escorts someone, it is a ballerina he is escorting and hence would be false if officers ever escort opera singers. In other words, the unfocussed material becomes part of the restriction of the modal adverb *always*, as schematized in (58):<sup>17</sup>

- (58) a. Always  $\begin{bmatrix} \textit{Restriction} & \text{someone escorts a ballerina} \\ \textit{Nuclear Scope} & \text{an officer escorts a ballerina} \end{bmatrix}$   
 b. Always  $\begin{bmatrix} \textit{Restriction} & \text{an officer escorts someone} \\ \textit{Nuclear Scope} & \text{an officer escorts a ballerina} \end{bmatrix}$

Although the exact mechanics of this process are the subject of Section 3.3, for now the following explanation will suffice: the restriction of the modal adverb in these cases is formed by removing the adverb itself from the sentence and replacing the focussed material with an existential quantifier of the same type. So, in *AN OFFICER always escorts a ballerina*, the restriction is *someone escorts a ballerina* and in *an officer escorts A BALLERINA*, the restriction is *an officer escorts someone*.

Notice that the unfocussed noun phrases in (57) could quite easily be pronounced with B-accent, given the proper context. For instance, if the question *Who escorts whom in St. Petersburg?* has been asked, the following dialogs are possible:

- (59) a. What about a ballerina? Who escorts her?  
 b. [An officer]<sub>A</sub> always escorts [a ballerina]<sub>B</sub>.  
 (60) a. What about an officer? Who does an officer escort?  
 b. [An officer]<sub>B</sub> always escorts [a ballerina]<sub>A</sub>.

Crucially for the purposes of this paper, the B-accented material is not focussed (as per BIN-F) and hence becomes part of the restriction.

Besides their similar pronunciation, one more indication that the first clause of a CC has the B-accent comes in examining the contexts where CCs can be used. Imagine, for instance, that two friends are discussing how to control a computer game – in particular, which keys on the keyboard control which actions in the game. Consider the following two subquestions related to this larger question and their potential answers:

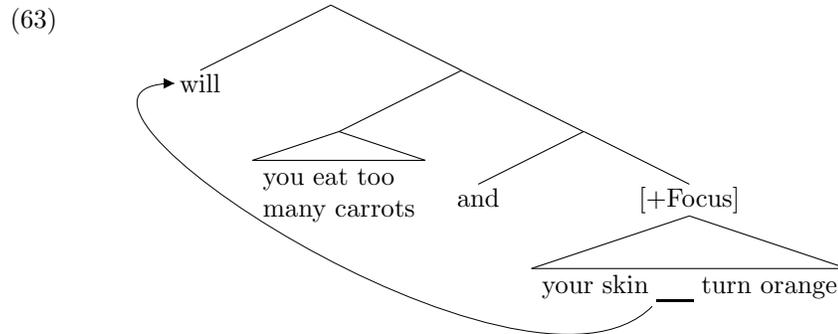
- (61) What about the space bar? What happens when you hit that?  
 a. You hit the space bar, and your character jumps.  
 b. You hit the space bar to make your character jump.  
 c. ??To make your character jump, you hit the space bar.  
 (62) What about jumping? How do you make your character jump?  
 a. ??You hit the space bar, and your character jumps.  
 b. You hit the space bar to make your character jump.  
 c. To make your character jump, you hit the space bar.

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<sup>17</sup>The meaning of a modal quantifier like *always* must crucially refer to minimal situations in order to avoid a host of problems, including making sure that the officers mentioned in the restriction are the same officers mentioned in the nuclear scope. See von Stechow (1994, p. 63) for discussion of this problem. I am leaving out this detail for ease of presentation.

When the subquestion refers to the space bar, as in (61), the CC in (61a) sounds fine. This is exactly parallel to (54) above, where the portion referred to in the subquestion gets the B-accent. Notice that in response to this question, it also sounds odd to use an actual fronted subordinate clause (*to make your character jump*) as in (61c). I believe that this is because fronted subordinate clauses also carry the B-accent and fill the same sort of role that B-accented material plays. Turning to the case where the subquestion refers to the action of jumping and does not refer to the space bar, as in (62), it sounds odd to use the same CC in this situation, even though, at some level, you are conveying the same information. The fronted subordinate clause is also fine in this situation. Based on this evidence, I will assume that the first clause of a CC is B-accented and therefore is not part of the focus of the sentence.

So far, we have seen that focus does not fall on the first clause of a CC, but there are several possible places where it might fall. I will assume that in the neutral case, the entire second clause of a CC is focussed, giving us the following structure for a neutrally pronounced CC:



Under Rooth’s theory of focus interpretation, the sentence therefore has the meaning schematized in (64) and paraphrased in (65):

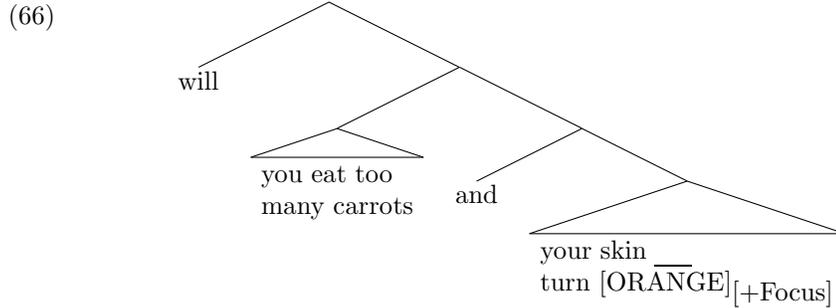
- (64) Will [Restriction you eat too many carrots and something happens]  
 [Nuclear Scope you eat too many carrots and your skin turns orange]

- (65) All future situations where you eat too many carrots are situations where you eat too many carrots and your skin turns orange.

Just as before, the restriction of the modal is formed by removing the modal itself from the sentence and replacing the focussed portion of the sentence with an existential quantifier of the same type. Here, the focussed portion is an entire clause, so I have replaced this clause with the sentence *something happens*. The restriction thus ends up being every situation where you eat too many carrots and then something happens. Since something happens after every situation where you eat too many carrots, this restriction is the same as the entire set of situations in which you eat too many carrots. So, the truth conditions are as described in (65).

Though the default may be to focus the entire second clause of a CC, focus sometimes does fall on a smaller portion of the sentence. This analysis makes a prediction about such cases: if the focus of the sentence is on a smaller part of the second clause, then the restriction of the modal will contain more material.

For instance, if we were discussing what different colors your skin would turn if you ate large quantities of different vegetables, I might pronounce this sentence with focus just on the word *orange*:



In this case, the meaning of the sentence would be as given in (67) and (68):

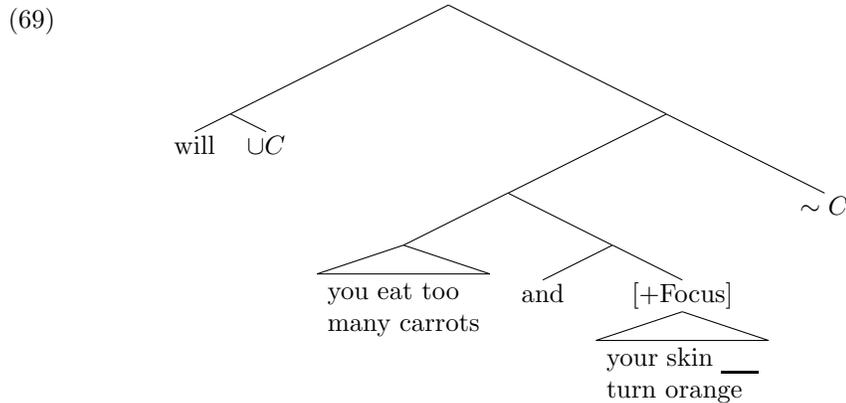
- (67) Will  $\left[ \begin{array}{l} \textit{Restriction} \quad \text{you eat too many carrots and} \\ \quad \quad \quad \quad \text{your skin turns some color} \end{array} \right]$   
 $\left[ \begin{array}{l} \textit{Nuclear Scope} \quad \text{you eat too many carrots and} \\ \quad \quad \quad \quad \text{your skin turns orange} \end{array} \right]$

- (68) All future situations where you eat too many carrots and your skin turns some color are situations where you eat too many carrots and your skin turns orange.

This seems to accord with intuitions about the meaning of this sentence, and hence the prediction is borne out.

### 3.3 Putting It Together

In this section, I will show a sample derivation for a CC. I will adopt von Stechow (1994)'s adaptation of Rooth's system to formalize the analysis. In this system, the relationship between focus and the modal's restriction is captured via the following LF structure:



Each node  $\alpha$  in the tree is assigned an ordinary semantic value, notated as  $\llbracket \alpha \rrbracket^o$ , and a focus semantic value, notated as  $\llbracket \alpha \rrbracket^f$ . In most cases,  $\llbracket \alpha \rrbracket^f$  is simply the singleton set containing  $\llbracket \alpha \rrbracket^o$ , except when  $\alpha$  contains a focussed word or phrase.

In this case,  $\llbracket \alpha \rrbracket^f$  will be the set of all (ordinary) semantic values resulting from replacing the focussed item with a suitable alternative of the same semantic type<sup>18</sup>. For instance, the focus semantic value of the conjunction in (69) will be the set of all propositions where you replace the second conjunct with a suitable alternative, as shown in (70):

$$(70) \quad \llbracket \text{you eat too many carrots and [your skin turns orange]}_{[+Focus]} \rrbracket^f \\ = \left\{ p \left| \begin{array}{l} p = \llbracket \text{you eat too many carrots and } S \rrbracket^o \text{ and} \\ S \text{ is an alternative to } \textit{your skin turns orange} \end{array} \right. \right\}$$

This set might potentially include cases where you eat too many carrots and you are fine, and cases where you eat too many carrots and you get sick, etc.

The  $\sim$  operator constrains the ordinary semantic value of its first argument (e.g.,  $C$  in (69)) to be a subset of the focus semantic value of its second argument (e.g., the conjunction in (69)). Therefore in (69), the variable  $C$  must be a subset of the set shown in (70)– a subset of the set of situations where you eat too many carrots and then something happens.

Now the connection to the restriction of the modal can finally be explained. As shown in (69), the modal takes  $\cup C$  as its first argument. Use of the same variable  $C$  is meant to indicate an anaphoric link between the argument of the modal and the argument of the  $\sim$  operator. The expression  $\cup C$  represents the union of the propositions in the set  $C$ . Taking this union is basically equivalent to creating a proposition with an existential in the position of the focussed item. For our sentence, therefore, this proposition could be paraphrased as *you eat too many carrots and something happens* – or, since something will always happen after you eat too many carrots, simply as *you eat too many carrots*. The definition in (71) shows how this proposition forms the restriction of the modal. With this machinery in place, the truth conditions for our sample structure come out as in (72).

$$(71) \quad \llbracket \text{will } \alpha \beta \rrbracket = 1 \text{ iff in all future situations } s \text{ such that } \llbracket \alpha \rrbracket(s)=1, \llbracket \beta \rrbracket(s)=1.$$

$$(72) \quad \llbracket (69) \rrbracket = 1 \text{ iff for all future situations } s \text{ such that you eat too many carrots in } s, \text{ you eat too many carrots and your skin turns orange in } s.$$

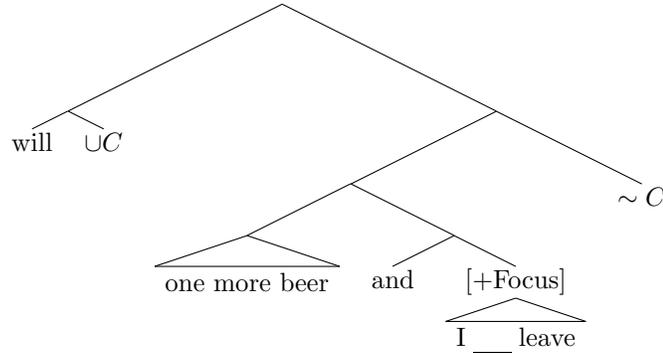
Notice that this analysis does not require a special meaning for the conjunction *and*, which retains a basic conjunctive meaning. In fact, as long as the system includes a generalized version of the Predicate Modification rule (Keenan and Faltz 1985, Heim and Kratzer 1998), the word *and* could in theory be semantically vacuous.<sup>19</sup>

The structures for OM-sentences and IaDs will be quite similar, perhaps as shown in (73). It is beyond the scope of this work to present exactly how the first clauses in (73) come to have propositional meanings, but once this is worked out, the semantic derivations for these sentences should proceed similarly.

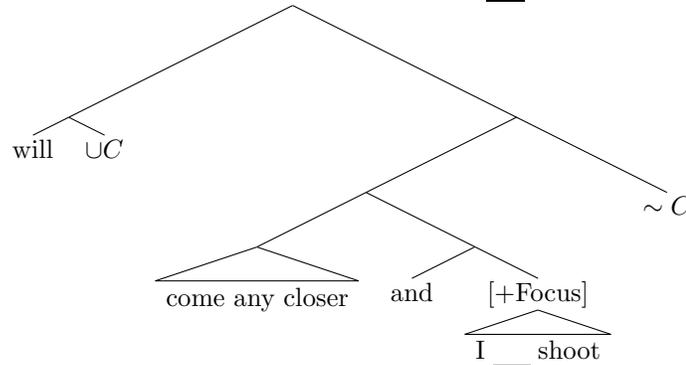
<sup>18</sup>Whether something is a suitable alternative is determined by context.

<sup>19</sup>See Section 3.4 for discussion of this point.

(73) a.



b.



### 3.4 Further Discussion

Two features of this analysis merit some further discussion: the meaning of *and* and the licensing of NPIs in CCs. First, I would like to note that we may in the end need a non-vacuous meaning for *and*, because conjunctions simply act differently than speech-act sequencing. For instance, consider the following example from Lascarides and Asher (1993):

(74) Max fell. John pushed him.

This sequence is most naturally interpreted as conveying a scenario where John pushed Max first, and this push caused Max to then fall. However, consider the same two sentences coordinated by *and*:

(75) Max fell and John pushed him.

Here, the most natural interpretation is one where John pushed Max after he fell, and there is not necessarily a causal relationship between the two events (because falling does not usually cause pushing). There is a less prominent reading which could be used in an argument over whether John's push caused Max to fall. This reading can be emphasized as shown in (76):

(76) Well, all I am saying is that Max fell and John pushed him. Draw your own conclusion.

But even this reading is different from the one found in speech-act sequencing. Other than in this special “argument” context, sentences with *and* seem to require the event in their second conjunct to occur at the same time or after the

event in their first conjunct.

This constraint seems to hold for CCs, as well. Consider the following:

- (77) a. If your skin turns orange, you eat/ate too many carrots  
b. #Your skin turns orange, and you eat/ate too many carrots.
- (78) a. If the alarm goes off, someone pressed this button.  
b. #The alarm goes off, and someone pressed this button.

In the (a) sentences above, a conditional meaning is expressed via an *if*-conditional where the antecedent (in the present tense) occurs after the consequent (in the present or past). However, this same meaning cannot be expressed by the CCs in the (b) sentences<sup>20</sup>. If indeed it turns out that the semantic constraints on normal conjunctions carry over to CCs, this would provide another argument against C&J's analysis. In their system, the two homophonous words  $\text{and}_C$  and  $\text{and}_{LS}$  share syntactic properties, but not semantic ones. Therefore it is odd under their proposal that parts of  $\text{and}_C$ 's semantics should appear in sentences involving  $\text{and}_{LS}$ .

Second, as C&J note, NPIs are allowed in the first conjunct of (some) CCs. For instance, the NPI *ever* is allowed in the first conjunct of (23a), repeated here as (79):

- (79) You ever do that again and I will report you.

Fauconnier (1975, 1978) and Ladusaw (1979, 1980a,b) propose that NPIs are licensed in downward-entailing environments (DEEs). The first clause of a normal conjunction is not a DEE, as shown in (80):

- (80) a. John drives a car and Mary drives a truck.  
b.  $\nRightarrow$  John drives an Audi and Mary drives a truck.

Example (80b) was formed by replacing the first clause of (80a) with a sentence that entails this clause. However, (80a) does not entail (80b). Thus, this is not a DEE. And as predicted, NPIs are not licensed in normal conjunctions, as shown in (81):<sup>21</sup>

- (81) \*John ever drives a car and Mary drives a truck.

However, the first clause of many CCs is a DEE; for instance, consider the following:

- (82) a. You buy a car, and your wife will get suspicious.  
b.  $\Rightarrow$  You buy an Audi, and your wife will get suspicious.

Taken as a whole, the CC in (82a) entails the CC in (82b). The first clause of (82b) entails the first clause of (82a). So, it does not come as too much of a surprise that NPIs are licensed in this position.

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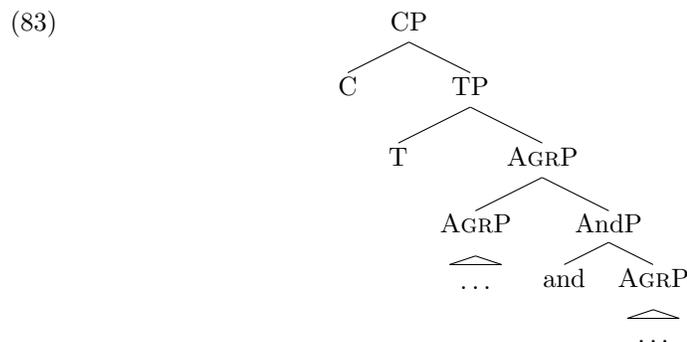
<sup>20</sup>One confounding factor is that it is quite hard to tell if these sentences involve an epistemic modal (which is already disallowed in the CC construction) or a metaphysical modal. However, I chose cases with pretty direct causal links: eating carrots causes your skin to turn orange and pressing the button causes the alarm to go off. Therefore, I would hope that metaphysical readings are at least available.

<sup>21</sup>This sentence is only acceptable if you can understand the relationship between the clauses conditionally – i.e., only if it is a CC.

There is one tricky part to this discussion, though, and it involves determining at what level the constraint on NPIs holds. Since, under my analysis, the conjunction itself has the same meaning as an ordinary conjunction, the first clause becomes a DEE only by virtue of the fact that it restricts the modal. However, it does not restrict the modal until the focus for the sentence has been computed. This means it is necessary to generate the LF representation of the entire sentence, including the focus restriction of the modal, before this clause is a DEE and can therefore license an NPI. This view is not too far from other modern definitions of NPI-licensing, though. For instance, von Stechow (1999) provides a careful analysis of the interaction of presupposition and NPI-licensing. In considering focus sensitivity, von Stechow concludes that under an interpretation of focus sensitivity as a presupposition, this phenomenon falls in line with his new constraint on NPI-licensing, which crucially occurs after presuppositions are taken into account.<sup>22</sup>

## 4 The Syntax of CCs

The previous section presented a semantic analysis of CCs. This section will look a little closer at the syntax of these sentences. I will argue for an analysis in which a CC represents one of several constructions where a single CP contains a coordination of some lower functional projection. The structure of a CC, I will argue, is as sketched in (83):



A single CP contains a single TP, but the complement of the T node is the conjunction of two AGRP nodes. The following subsections will flesh out and give arguments for this proposal and discuss its consequences.

### 4.1 What is Conjoined

This subsection will argue for the analysis that the conjoined phrases in a CC are AGRPs. C&J give some clues as to which projection is coordinated in a CC. They point out that conditional readings do not appear in VP-conjunction (84) or CP-conjunction (85):

(84) #You eat too many carrots and turn orange. (no CC reading)

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<sup>22</sup>I refer the reader to von Stechow (1999) for details on this proposal. Also relevant is von Stechow's discussion (in his Section 4) of NPI licensing in the antecedents of conditionals.

- (85) a. You know, of course, that you eat too many carrots and you turn orange. (has CC reading)  
 b. You know, of course, that you eat too many carrots and that you turn orange. (no CC reading)

So, the conjoined phrase must be somewhere between these two heads in the sentence topology, but some further analysis is necessary to pinpoint the exact location.

#### 4.1.1 Tense

Another clue comes from the interaction of CCs and tense. C&J show that while CCs sound fine with present-tense first conjuncts and present- or future-tense second conjuncts, other combinations do not fare so well, as shown in (86):

- (86) a. #You ate/have eaten too many carrots and you turn/will turn/turned/have turned orange. (no CC reading)  
 b. #You eat too many carrots and you turned/have turned orange. (no CC reading)

The one exception to this observation (unobserved by C&J) is that when describing a tendency that held in some past time, it is acceptable to use a CC where both conjuncts appear in the past tense, as shown in (87)<sup>23</sup>:

- (87) Back in those days, schools were strict: you came in one minute late and you got detention for a week.

In (87), the verbs *came* and *got* both have to appear in the past tense, yet a conditional reading is maintained. Even in this context, though, the perfect is disallowed, as shown in (88):

- (88) Back in those days, schools were strict: #you had come in one minute late and you got/had gotten detention for a week.

There are a few more potential exceptions to this observation, but these remaining exceptions have alternative explanations. First, as C&J point out (in footnote 5), in a context where the speaker is “about to open a door to find out whether [the addressee has] broken anything,” (89) is acceptable:

- (89) You’ve broken another vase and I’m leaving.

Given the strict requirement that (89) be uttered in a context where the results of a past event are about to be revealed, this seems to be an elliptical version of (90):

- (90) I discover that you’ve broken another vase and I’m leaving.

Hence, I will not consider this an actual exception to the rule. Similarly, I will not consider the following sentence (unobserved by C&J) an exception, either:

- (91) a. You reach the ocean and you have gone too far.  
 b. If you reach the ocean, you have gone too far.

<sup>23</sup>A similar observation for IaDs is found in Jespersen (1909).

Some speakers accept (91a) as a CC, having the meaning paraphrased in (91b). This is another case where the context is such that there is a discovery of a past event some time after it has happened. Again, I take this sentence to mean something like (92):

- (92) You reach the ocean, and you will discover/know that you have gone too far.

This analysis shows that the only tense combinations allowed in a CC are present+present, present+future, and past+past. We can narrow this list down further if we consider the future to be a modal (*will* or *be going*), rather than an actual tense. After this is taken into account, the only tense combinations that remain are simple present in both conjuncts and simple past in both conjuncts. This dearth of tenses and the fact that the tense in each conjunct must match the tense of the other conjunct strongly suggest that the two conjuncts share a tense node.

Further evidence for this analysis comes from the semantics of CCs. Consider the two cases below:

- (93) a. You come in one minute late and you usually get detention.  
b. You came in one minute late and you usually got detention.

As argued above, the modal adverb *usually* in (93a) and (93b) takes scope over both of the conjuncts, yielding interpretations in which most situations where you come in late are also situations in which you come in late and get detention. Notice that the tense does not seem to play a role in the interpretation of either clause – in fact, since both clauses end up describing the same situation, they both have to occur at roughly the same time.

The tense does play a role higher in the sentence, though, and it seems to scope over the modal. (93a) quantifies over a set of situations, some of which may be in the past and some of which in the future, but crucially the set must include situations occurring near the present time. It asserts that most of these situations are such that if you come in a minute late, you get detention. (93b), on the other hand, quantifies over a set of situations entirely in the past, making the same exact (conditional) assertion about this different set of situations. Basically, (93a) is a case where “usually” holds in the present and (93b) is a case where “usually” holds in the past. This is strong evidence that the tense scopes over the modal. Since the modal scopes above the conjunction, then, the tense must also scope above the conjunction. Under this analysis, the morphological past tense realized on the two verbs in (93b) is purely the result of an agreement relation between the verb and the past tense head above the conjunction. This morphology carries no semantic tense whatsoever (see Abusch 1988, 1997, Ogihara 1989, 1996).

#### 4.1.2 Agreement

The evidence presented so far suggests that the conjuncts in a CC are above the VP, but below the TP. This subsection will argue that these conjuncts are AGRPs, where AGR is the functional node that enforces the EPP and subject-

verb agreement in English.<sup>24</sup>

Although, as shown above, the tense of the two conjuncts in a CC must match, they may have different subjects, and hence different subject-verb agreement. For instance, consider (94):

- (94) a. You come/\*comes in one minute late and the teacher gives/\*give you detention.  
b. The teacher is/\*are ten minutes late and you are/\*is allowed to leave.

The verb in each coordinated clause in (94) must agree with its own subject, even if that means that the two verbs do not agree with each other. Thus, subject-verb agreement seems to be local to each conjunct, not shared across the two conjuncts as tense is.

The EPP must be also be satisfied locally, inside both conjuncts. For instance, consider the following:

- (95) The weather is quite predictable around here. . . .  
a. It looks like rain and it always does rain.  
b. \*It looks like rain and always does rain. (\* on CC reading)
- (96) Don't wear a hat. . . .  
a. You wear a hat and it seems like you have something to hide.  
b. \*It you wear a hat and seems like you have something to hide.

These sentences show that the expletive subject *it* must be local to its verb. (95) shows that a single expletive *it* cannot satisfy the EPP for both conjuncts, and (96) shows that the expletive *it* for the second conjunct must appear after the *and* rather than at the beginning of the sentence. Thus, since the EPP and agreement are local to both conjuncts, I propose that both conjuncts have their own AGR head.

## 4.2 Modal Raising

The next question that arises for the current analysis of CCs concerns what evidence there is that modals can raise at all. Since at least Siegel (1987), it has been observed that a modal operator inside of a conjunction can at least appear to scope above the conjunction. The following are examples of this phenomenon from constructions only marginally related to CCs:

- (97) a. Ward can't eat caviar and his guests eat dried beans (Siegel's 2)  
b.  $\approx$  It's not allowed for Ward to eat caviar and his guests to eat dried beans.
- (98) a. They must have loosened the hooks and Mr. Cleaver didn't notice it. (Whitman 2010)

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<sup>24</sup>In doing so, I side with Pollock (1989) over Belletti (1990) in arguing that, at least in English, T c-commands AGR. This also contradicts Chomsky (1995, p. 354), who argues for eliminating the AGR position(s) entirely. One reason that Chomsky cites for removing these heads is the goal that every syntactic head have both phonological and semantic effects. But AGR does have clear phonological effects in that it induces morphological changes on the verb; and if AGR were collapsed with the Voice head proposed in Kratzer (1994), it would have semantic effects as well.

- b.  $\approx$  It must be the case that they loosened the hooks and Mr. Cleaver didn't notice it.
- (99)
- a. You can hit it as hard as you want and it won't break.
  - b.  $\approx$  It's possible that you (will) hit it as hard as you want and it won't break.

In each of these cases, a modal in the first clause of a conjunction seems to take scope over the entire conjunction. This is reflected by the fact that the (a) sentences above all have paraphrases (given in the (b) sentences) where an actual modal takes overt scope over a conjunction. These cases differ from CCs in that they lack the same distinctive intonation and also lack the focus restriction we saw in CCs. In fact, the modals in the paraphrases are not restricted by any material in the rest of the sentence, which is entirely inside the modal's nuclear scope. (This contrasts with the cases discussed in section 1.4, where a modal in the first clause of a conjunction might be restricted by overt material in the sentence.) Although I will not analyze these cases here, I believe that these sentences are also examples of conjunctions which share the upper projections of a CP.

Other evidence for modal raising comes from Lechner (2006), who discusses sentences like (100a), which can be paraphrased as in (100b):

- (100)
- a. Penalties can sometimes not be avoided.
  - b. It is sometimes not possible to avoid penalties.

As shown by the paraphrase, the relative scope of the operators in (100a) are as follows: *sometimes* >  $\neg$  >  $\diamond$ . Lechner points out the following two possible derivations of this meaning from this sentence:

- (101) Modal Reconstruction (Lechner's (20)):
- a. Surface Order: [penalties can<sub>1</sub> [sometimes [not [t<sub>1</sub>
  - b. Reconstruction: [penalties [sometimes [not [can
- (102) Neg-Shift (Lechner's (21)):
- a. Surface Order: [penalties can [sometimes [not
  - b. Neg-Shift: [not<sub>1</sub> [penalties can [sometimes [t<sub>1</sub>
  - c. QR: [sometimes<sub>2</sub> [not<sub>1</sub> [penalties can [t<sub>2</sub> [t<sub>1</sub>

The first derivation assumes that the modal *can* has raised to its surface position. In the course of the derivation it reconstructs to its base position below negation (and the adverb *sometimes*), yielding the proper scope of all the operators. The second derivation does not require the modal to move at all. Instead, negation moves over the modal, then the adverb raises via QR to a position above negation.

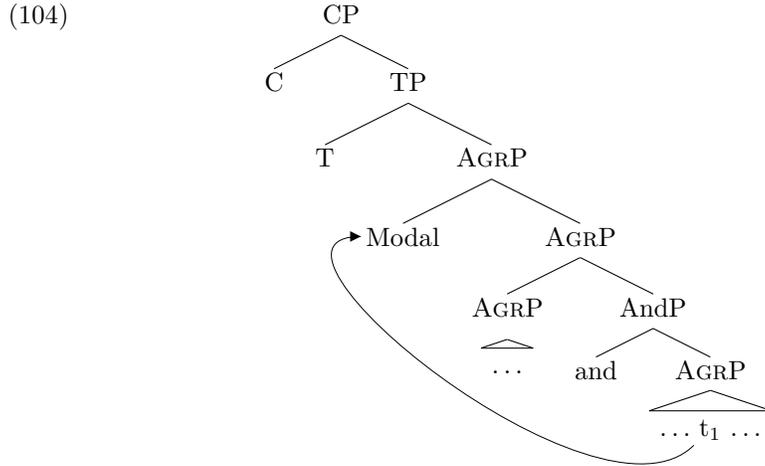
This second derivation runs into a problem, though. It can be shown independently that the word *sometimes* cannot move to outscope negation. Lechner gives the following example:

- (103) \*John didn't sometimes come to class.

As a positive polarity item, *sometimes* must move above negation to be licit. However, as a weak indefinite, the adverb may not cross the island established by negation, and therefore the sentence is out. However, it is exactly such a

movement that was posited in the derivation in (102). So, Lechner assumes that the derivation in (101), where the modal moves, must be the correct one.

Based on this evidence, I will assume that the modal actually does raise (at LF). So, to recap the elements of the analysis thus far (schematized in (104)), there is a CP dominating a TP dominating an AGRP conjunction. A modal from inside the second clause raises to a position above AGRP to dominate the conjunction.<sup>25</sup>



## 5 Explaining the Restrictions on CCs

The analysis presented above captures the meaning and syntactic restrictions of sentences we know to be acceptable CCs. However, we have not yet begun to look at the conditions which make a CC either acceptable or unacceptable. The main way I will pursue this goal is by comparing CCs to standard *if*-conditionals.

CCs only exhibit a small portion of the range of meanings available to conditionals in the standard construction using the word *if*. As mentioned above, there are strict tense requirements on CC sentences; *if*-conditionals are much freer, supporting a wide range of tenses, as shown in (105):

- (105)
- a. If you ate too many carrots yesterday, your skin turned orange.
  - b. If you have eaten too many carrots, your skin will have already turned orange.
  - c. If you ate too many carrots, your skin would turn orange.

I have proposed that the tense restrictions in CCs are due to the fact that the conjoined clauses are below TP. This restriction is not an issue for *if*-conditionals. The main (consequent) clause of an *if*-conditional can presumably be a full CP. The *if*-clause could also contain a tense node, allowing a wider range of tenses in both clauses.

A potentially related distinction is the fact that *if*-conditionals can express counterfactual propositions, unlike CCs, as shown in (106):

- (106) a. If you had eaten too many carrots, your skin would have turned

<sup>25</sup>I have illustrated this movement as adjunction, but it could be head-raising. Either way, I assume that the movement is one of the (many) exceptions to the CSC, as discussed above.

- orange.
- b. \*You had eaten too many carrots and your skin would have turned orange.

Several recent authors (Iatridou 2000, Condoravdi 2001, among others) have suggested a link between counterfactuality and tense, and so these facts are not unexpected.

Additionally, *if*-conditionals can express meanings with more flavors of modality than CCs. The types of modals we have seen in CCs so far are listed in (107) (these correspond roughly to the oft-discussed class of “root modals”):

- (107) a. Circumstantial/Probability: *will, might, probably, possibly*
- b. Generic: *generally*, null generic modal
- c. Deontic: *should, can, have to, be required, be allowed*
- d. Ability: *can, be able to*

However, as Schwager (2005) observes, CCs simply do not work with epistemic modals, as shown in the following:

- (108) a. If John left work at six, he must be home by now.
- b. #John left work at six and he must be home by now. (no CC reading)
- (109) a. If you have the other half of the locket, you could be my long-lost sister.
- b. #You have the other half of the locket and you could be my long-lost sister. (no CC reading)

(108a) is an *if*-conditional with the epistemic modal *must*; (108b) is a failed attempt at a CC with a similar meaning. (109a) is an *if*-conditional with the epistemic modal *could*; (109b) is a failed attempt at a CC with the same meaning.

All of the conditionals mentioned so far are called hypothetical conditionals by Bhatt and Pancheva (2006) in their handbook article on the phenomenon. These are cases where the speaker is trying to convey that the consequent is true in certain cases delineated by the antecedent. Bhatt and Pancheva (B&P) also discuss two other kinds of conditionals (see also Iatridou (1991)). First, they discuss factual conditionals, which presuppose that someone other than the speaker thinks the antecedent is true. These are often used in arguments and are exemplified in (110a) and (111a) below. As shown in the (b) examples, however, CCs cannot have a factual conditional meaning:

- (110) a. If you’re so smart, why don’t you fix the computer?
- b. \*You’re so smart and why don’t you fix the computer?
- (111) a. If John is sensitive, he has a funny way of showing it.
- b. #John is sensitive and he has a funny way of showing it. (no CC reading)

The other type of conditional B&P discuss they call a relevance conditional. The antecedent of such a conditional outlines the cases in which the consequent is relevant to the discourse rather than outlining when the consequent is true; for this reason, it is also called a speech-act conditional. As shown in (112), this

type of conditional does not work with CCs, either:

- (112) a. If you're thirsty, there is beer in the fridge. (B&P's (95c))  
 b. #You're thirsty and there is beer in the fridge. (no CC reading)

Making syntactic distinctions between modals is a well-established enterprise. Authors such as Jackendoff (1972), Picallo (1990), Iatridou (1991), Brennan (1993), Cinque (1999), and Hacquard (2006) have all assumed different positions for different types of modals. The general consensus is that whatever operators control relevance and factual conditionals are the highest in the clause structure, followed by epistemic modals (above tense) and finally the root modals (below tense). So, there does seem to be a correlation between the height of the modal in the clause and whether the modal supports the CC construction.

Although I am not able to explain the correlation completely<sup>26</sup>, I can at least peel away one more layer of this mystery. As we have seen, modals associate with focus; in fact, this phenomenon has been an integral part of the analysis presented in this paper. For instance, the sentence in (113a), which contains the modal adverb *always*, has the semantic structure in (113b), where the unfocussed material has joined the restriction, and hence the paraphrase in (113c). The sentence in (114a), which contains the deontic modal *must*, receives a similar analysis. (Notice that the presupposition of the phrase *your dog* does not escape the modal context.)

- (113) a. An officer always escorts [a ballerina]<sub>[+Focus]</sub>  
 b. Always 

[ <i>Restriction</i>	an officer escorts someone]
[ <i>Nuclear Scope</i>	an officer escorts a ballerina]

  
 c. If an officer escorts someone, he always escorts a ballerina.
- (114) a. You must keep your dog [on its leash]<sub>[+Focus]</sub> in this park. (Halliday 1967)  
 b. Must 

[ <i>Restriction</i>	you have a dog in this park]
[ <i>Nuclear Scope</i>	you keep your dog on its leash in this park]

  
 c. If you have a dog in this park, you must keep it on a leash (in this park).

It is interesting to note, however, that epistemic modals do not seem to associate with focus. For instance, consider the sentence in (115a), containing the epistemic version of *must*:

- (115) a. John must have [driven]<sub>[+Focus]</sub> to work.  
 b.  $\approx$  We know that John went to work and we can deduce that he drove there.  
 c.  $\neq$  If John went to work, he must have driven to work.

Unlike the cases with root modals above, the unfocussed material does not join the restriction of an epistemic modal: the sentence says that all (current-time) worlds compatible with the speaker's knowledge are such that John drove to

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<sup>26</sup>Although it is tempting to say that since epistemic, relevance, and factual modals are above tense, they cannot appear in the second clause of the CC, this explanation would ignore the fact that in this analysis the modal raises to its final position and so could have begun in a lower position.

work, not just those worlds where he went to work.<sup>27,28</sup> It is hard to even construct examples for relevance and factual conditionals, but the following sentences are the best I could come up with:

- (116) a. [There are biscuits in the cupboard]<sub>[+Focus]</sub> for hungry boys!  
 b. ≠ If there are hungry boys, there are biscuits in the cupboard.
- (117) a. You should [leave]<sub>[+Focus]</sub> the man you hate so much.  
 b. ≠ If there's a man you hate so much, you should leave him.

These sentences cannot have meanings restricted by the unfocused portion of the sentences either.

Thus, it appears that none of these “high” modals can associate with focus.<sup>29</sup> In the analysis presented above, though, it was essential that the main modal in a CC sentence receive its restriction from the unfocused portion of the sentence. If the main modal involved is a high modal and therefore cannot do so, it makes perfect sense that the sentence involving this modal will not have a CC reading.

## 6 Conclusion and Extension

This paper has shown that CCs are actually more similar to regular *if*-conditionals than previously thought. In particular, both constructions involve the restriction of an overt or covert modal to form a conditional meaning. In an *if*-conditional, this restriction happens syntactically when an *if*-clause combines with the modal. In a CC, the restriction must be formed via focus structure, which explains the characteristic pronunciation of CCs. Previous approaches have not captured this observation and have furthermore proposed unparsimonious elements such as two words pronounced *and*. Without any new machinery, though, the analysis presented here can explain the semantic and syntactic properties of CCs in fuller detail than previous proposals.

I will leave you with a possible extension to this analysis involving the interaction between CCs and donkey anaphora (Geach 1962, Evans 1977, 1980, Heim 1990). CCs, like *if*-conditionals, do license donkey anaphora. We have

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<sup>27</sup>One red herring in this analysis is a sentence like the following:

- (i) John must [drive]<sub>[+Focus]</sub> to work.

The epistemic reading of the sentence in (i) seems to only quantify over situations where John is going to work, and says that John drives in these situations. However, upon closer examination, this can be seen as the effect of generic tense on the sentence below the modal. To see this more clearly, consider the following two possible paraphrases of (i):

- (ii) a. If John goes to work, he must drive to work.  
 b. It must be the case that if John goes to work, he (generally) drives to work.

The paraphrase in (iib), where the modal *must* scopes over a generic sentence captures the intuitive truth conditions of (i) more closely. Hence, I will assume that sentences like these merely represent generic tense associating with focus rather than the epistemic modal itself doing so.

<sup>28</sup>I am not claiming that the focus in (i) does nothing. There is a presupposition, triggered by focus, that John went to work.

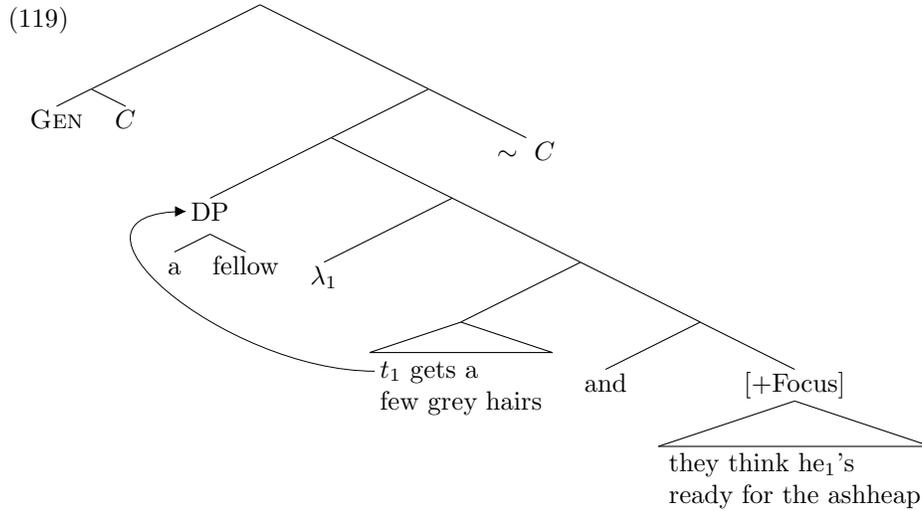
<sup>29</sup>I cannot help but wonder what relationship this apparent restriction has to the constraint, described by von Stechow and Iatridou (2003), that quantifiers may not scope above epistemic modals.

already seen a few instances of this, repeated in (118a) and (118b), and the phenomenon is pretty productive, as shown in the other sentences in (118):

- (118) a. A fellow gets a few gray hairs and they think **he**'s ready for the ashheap.  
 b. A telegram comes and you're sure **it**'s bad news.  
 c. Give a girl the right shoes and **she** can conquer the world. (Marilyn Monroe)  
 d. You make one mistake and **it** haunts you for the rest of your life.

The bold-faced pronouns in the second clauses of (118) all act as though they are bound by existential quantifiers in the first clauses, and hence might be considered donkey pronouns.

Due to the syntax of a CC, however, these donkey pronouns are much less mysterious in this construction. Consider the following structure for the sentence in (118a):



In this structure, the DP *a fellow* raises from the first conjunct to a position below the focus operator  $\sim$ <sup>30</sup>. Therefore, the generic modal GEN is restricted to situations where there is a fellow  $x$  such that  $x$  gets a few grey hairs and something (else) happens to  $x$ . The full meaning of the sentence is that in these situations, there is a fellow  $x$  such that  $x$  gets a few grey hairs and they think that  $x$  is ready for the ashheap. In this way, the quantificational DP *a fellow* can actually bind the apparent donkey pronoun in the second clause without scoping above the modal. Although I am not ready to propose that this approach will work for other cases of donkey anaphora, it is an intriguing avenue for future work.

<sup>30</sup>Extraction from inside this conjunction is not ruled out by the CSC as shown above, especially because the quantifier binds an element in each clause.

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