

The Syntax and Semantics of Implicit Conditionals: Filling In the Antecedent

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Chapter 1

Introduction

This is a thesis about conditional sentences. More specifically, it is about a particular class of conditional sentences, which presents a unique challenge to any semantic theory. I am speaking of sentences of the type exemplified in (1), which I refer to as “implicit conditionals” or ICs.¹ ICs are characterized by a resemblance in morphology to the consequent clause of a subjunctive conditional sentence, in particular the occurrence of the modal *would* or another conditional modal. Semantically, ICs are conditional in meaning, despite the fact that they lack the clausal complexity of full conditionals; the latter are exemplified in (2).

- (1) a. John would hate Paris.
b. John would feed a unicorn.

- (2) If John lived in France, he would hate Paris.

So an implicit conditional resembles the consequent of a full conditional, but as such is missing its antecedent. However, since many ICs are quite grammatical and felicitous to native speakers, we must be finding some way to interpret them. The focus of this dissertation, then, is to determine by what process ICs are interpreted. We will see that this

¹Kasper (1992) refers to the same construction as a “simple subjunctive”.

problem can be more specifically stated as the problem of how to “fill in” the antecedent when we are interpreting an IC, to come up with what I call the “understood antecedent”.

ICs themselves have received relatively little attention in the literature. Kasper (1992) does develop an account of some of their properties, under the name “simple subjunctives”, under a DRT framework. I do not present a detailed review of that paper here, but this thesis attempts a more complete survey of different IC constructions, and an analysis that is sufficiently general to capture the many complex clusters of interpretive judgments of them. It is unclear how Kasper’s analysis could be extended to the data in, for example, chapters 4-6.

ICs bear a relationship to a class of sentences which has received considerably more attention, the class of generic sentences, exemplified in (3).

(3) John generally attends a good play.

Generic sentences have been discussed, for example, by von Stechow (1994) and Diesing (1992), with related but somewhat different goals.

The work focuses on those ICs which have readings where the understood antecedent is partly formed by part of the overt material in the sentence itself. An example of this is (1b), one reading of which is roughly paraphrasable as (4), in which the noun phrase *a unicorn* occurs in the antecedent of the paraphrase, even though in the overt material of the IC the noun phrase occurs in what looks like the consequent of a conditional.

(4) If a unicorn existed, John would feed it.

The dissertation is organized as follows. Chapter 2 introduces the basic data that my analysis is designed to account for, as well as an informal introduction to the analysis I will exhibit more fully in chapter 3. I introduce the IC construction, and divide it into two general classes: those for which the understood antecedent is determined entirely from the discourse context, which I label “sentence-external” ICs, and those for which part of the understood antecedent is derived from the structure of the sentence, labeled “sentence-internal” ICs. Within the sentence-internal category, I focus mainly on ICs with indefinite noun phrases in them, in which case it is usually that noun phrase which forms part of the antecedent.

I argue that the best analysis for sentence-internal ICs is one where at LF, the syntactic level that is interpreted, there is a formal relationship between some noun phrase in the overt material of the IC and the understood antecedent. This is formalized as a step of covert movement of the noun phrase from its surface position to a position where it can be interpreted as part of the antecedent. The movement is sideward, in the sense of Hornstein 1999 and Nunes 1995, 2001; that is, the movement is not to a position which c-commands the trace, or copy, of the element being moved.

Chapter 3 turns to the basic formal analysis of ICs. A number of general semantic and syntactic tools are introduced, including some standardly assumed ones and others which are modified for the purposes of the analysis. I then show how they can derive the basic cases of both sentence-external and sentence-internal ICs.

In chapter 4 I show how the analysis can be extended to ICs with quantifiers other than indefinite noun phrases, focusing on the sentence-internal readings. First I discuss ICs with definite noun phrases in them, such as (5).

- (5) a. John would feed the unicorn.
b. John would dance with the debutante.

The question here is in what way the presuppositions of the definite determiner project in ICs. I show that their projection patterns are correctly predicted by the analysis developed in the previous chapters.

I then investigate ICs containing noun phrases headed by other determiners, such as upward-entailing plural determiners (*most, some, etc.*), upward-entailing singular determiners (*every, each*), and downward-entailing determiners (*few, no, etc.*). The judgments in these cases are fairly complex, but once investigated closely, are also correctly predicted by the analysis.

The basic analysis doesn't change, but certain other syntactic options become necessary.

Chapter 5 discusses an issue which pervades many of the more natural ICs, namely those where a noun phrase is interpreted propositionally. The judgments regarding these examples turn out to be quite complex, and require a tightly woven set of constraints on the syntax of the LF-level of the construction.

In chapter 6 I provide some supporting evidence that the analysis of the IC construction defended in the thesis is on the right track, by showing that it makes correct predictions which some otherwise plausible alternative analyses fail to make. I explore the extent to

which these alternative analyses can do the same job as the one in the thesis, but then show some data, some presented in previous chapters and others introduced there, which distinguish between the two analyses.

Chapter 7 then reviews the conclusions and results of the work.

Chapter 2

Implicit Conditionals with Noun Phrases

2.1. Introduction

The purpose of this chapter is to establish the truth conditions of IC sentences, and to begin to explore the ways in which these truth conditions can arise compositionally. In particular, we will focus on how the interpretation of these sentences comes to have a conditional structure, including both a semantic antecedent and a semantic consequent. The immediate challenge, of course, is that ICs do not have overt antecedents.

In this discussion, I will divide ICs into two major types: ICs in which an indefinite noun phrase is present and is important in forming the semantic antecedent, and ICs which either don't have an indefinite noun phrase or which have one, but it is not integral to the antecedent, at least not on the reading in question. I refer to the former category as sentence-internal ICs, and the latter as sentence-external ICs, anticipating an analytical distinction in which the former type will be seen as forming its (semantic) antecedent from material within the sentence itself, while the latter type forms the antecedent from material not found in the sentence, usually conversational background.

2.2. Sentence-External Implicit Conditionals

This section deals with ICs where indefinite noun phrases either are not present or, if present, are not contributing in a special way to the understood antecedent. To make the judgments clearer we will focus on the former. Let us look at a few examples, and first investigate their truth conditions broadly.

- (6) a. John would hate Paris.
- b. Mary would kick John.
- c. Sigmund would water the plant.

The truth conditions of the sentences in (6) seem to be greatly dependent on the context of the utterance. This is especially true in the case of (6c), with a definite noun phrase which contributes an independent dimension of context dependence. In my judgment, (6b) is intermediate in its context-dependence, while (6a) is the least so.

Let us therefore start with (6a), and decide what its intuitive truth conditions are. In order to do this, we will have to also decide what the conversational background must be in order for it to be interpretable. A likely paraphrase for (6a), one that seems to capture the likely intention with a relatively small amount of information in the background, is (7).

- (7) If John went to Paris, he would hate it.

Note that this paraphrase is a full conditional. Although the paraphrase has no theoretical status, I believe it is an instructive representation of what the implicit conditional means.

Therefore, this will be the general format of my discussion of the truth conditionals of ICs; I will always present a full conditional paraphrase as a candidate for a more precise illustration of the IC's truth conditions in a given context. This allows me to more precisely pose the central question to the interpretation of ICs: since their paraphrase will be a full conditional, with an antecedent as well as a consequent, whereas the IC itself has only the consequent component, we can then assume that something like the antecedent in the full conditional is understood in the IC as well. We can then ask the question: where does this understood antecedent come from?

Still remembering that we are currently dealing with sentence-external ICs, a first approximation to an answer to this question seems to be:

- (8) **Sentence-External Antecedent-Filling:** The antecedent in the correct paraphrase for the IC will be an antecedent which expresses the most plausible alterations to current contextual knowledge which would make the content of the IC (interpreted as a consequent in the paraphrase) relevant to the context of utterance.

This answer is deliberately vague and informal for now, but let us look at it in the context of the examples. First, in (6a), we expressed a preference for (7) as the paraphrase with minimal context. But how minimal was this context? If we reflect on what we are likely to have assumed as background knowledge when reading (6a), we will probably realize that we have assumed that John either has never been to Paris, or at any rate doesn't live there.

Since we are dealing with a (semi-²)counterfactual conditional sentence, we then have to decide what the counterfactual assumption will be. That is, we will change the assumed conversational background in such a way as to make it possible for John to hate Paris. (In the actual situation, it is unlikely that John actually hates Paris, given the usual assumption that to hate something requires familiarity with it.) Thus, the minimal alteration to the current context seems to be one where John goes to Paris, or comes to live there, depending on what degree of familiarity we are inclined to require in order for hatred to occur.

In another context, such as one in which John is assumed to live in Paris, (7) would in fact be a rather lousy paraphrase for (6a). In this latter context, we would probably need more information in order to discern a likely antecedent, via (8). (The subjunctive mood of the IC leads us to suggest that it is further background knowledge that John does not, currently, hate Paris, even though unlike in the earlier context, he has enough experience with Paris to potentially hate it. The issue of mood will be discussed further below.) For example, perhaps the contextual knowledge is that John lives in Paris, and that the mayor of Paris is considering imposing a curfew, though this has not in fact happened. In this context, (9) may be a reasonable paraphrase of (6a). However, it does seem that much more contextual knowledge is required to assume a reading like (9) than for a reading like (7); indeed, this is more likely to arise in the immediate context of a conversation establishing the relevant background, such as if the immediately preceding sentence was

² Iatridou (2000) shows that there is a distinction between true counterfactual conditionals, which presuppose that their antecedent must be false, and what is variously called hypothetical, semi-counterfactual, or future-less-vivid conditionals, which do not presuppose that their antecedent must be false but merely cannot presuppose that it is true. I will mostly deal with the latter type in this thesis, but will refer to it as “counterfactual” where no ambiguity arises.

“The mayor is talking about imposing a curfew”, rather than just background knowledge of this possibility.

(9) If the mayor of Paris imposed a curfew, John would hate Paris.

Moving on to examples (6b-c), it becomes apparent that in order to apply (8) in finding the antecedent for the paraphrase, we need to know a bit about the context of utterance we are assuming. For (6b) we need to know what the minimal change to the background circumstances is that would put Mary in a position to kick John. The background assumptions in this case may be rather minimal. We may assume that Mary has not in fact kicked John, and that moreover she is not currently in a position that would allow her to kick John; perhaps she is nowhere near him at present. If these are the assumptions, the paraphrase may be as in (10).

(10) If Mary encountered John, she would kick him.

This is, again, only one of several imaginable background scenarios that would make (6b) felicitous. Other contexts would yield different paraphrases. For example, another set of circumstances would be that Mary is in fact right next to John, and John has not yet done anything to anger Mary, but he has a habit of tapping his foot loudly and they are in a situation of the type in which John often does this. In this circumstance, upon hearing (6b) a paraphrase like (11) is more likely to come to mind.

(11) If John started tapping his foot, she would kick him.

As with paraphrase (9) for (6a), paraphrase (11) seems to me to require a more concrete set of background assumptions to serve as the correct paraphrase for (6b) than (10) does; the latter may require overt conversation.

As I mentioned above, (6c) has two elements which require contextual support in order to make the sentence felicitous. This is because in addition to being an IC, (6c) contains a definite noun phrase, which requires existence and uniqueness of a plant. So a minimal context for (6c) would be that there is a unique salient plant, and that for some reason Sigmund is either not currently in a position to water it or not currently inclined to water it. Perhaps either he is out of town, or it is raining and the plant is kept outside. So two plausible paraphrases of (6c) are in (12).

- (12) a. If Sigmund were in town, he would water the plant.
b. If it weren't raining, Sigmund would water the plant.

Note that both still contain the definite article, and hence both still have the presupposition about the plant that (6c) has. This accords with intuitions, and capturing this fact will be an important part of the analysis to be sketched below, after we discuss ICs with indefinites.

2.3. Sentence-Internal Implicit Conditionals

This section discusses ICs like the ones in (13)³, that is, ICs that have an indefinite noun phrase somewhere in the sentence.

- (13) a. John would kick a unicorn.
b. A yeti would ravage our town.
c. John would hate a war.

These sentences differ from sentence-external ICs, in that ICs with indefinites can be interpreted with almost no context whatsoever. A natural interpretation of such sentences puts the indefinite at the heart of the understood antecedent. In the case of (13), since we have chosen noun phrases which introduce entities which don't exist in our world (unicorns and yetis), it is specifically the hypothetical *existence* of something with the properties of the indefinite which forms the antecedent, with perhaps other properties attached. (In the case of a war, although wars exist, their duration is limited and so there are many contexts in which the existence of a relevant war would be counterfactual as well.) That is, natural paraphrases of (13) are as in (14).

- (14) a. If a unicorn existed (and were in John's vicinity), John would kick it.
b. If a yeti existed (and were in the vicinity of our town), it would ravage our town.
c. If a war happened, John would hate it.

³ Some sentence-internal ICs, on the sentence-internal readings, seem to have a characteristic intonation, with two pitch peaks: one on the verb and another on the noun phrase. This intonation seems to be more exaggerated for some cases than for others. I do not attempt in this thesis to characterize why this intonation occurs with this reading, although chapter 6 discusses a possible analysis of the reading taking some advantage of the pitch accent on the verb. In the end, however, I reject that analysis.

Existence was a primary part of the antecedents in (14) mainly because we chose for our indefinite noun phrases examples of things which either do not exist at all in the real world, such as unicorns and yetis, or do not exist at all times and places, such as a war. If the indefinite denotes a more mundane object, then the understood antecedent will be a bit different, but will still involve the indefinite in an important way.

- (15) a. John would dance with a debutante.
b. Mark would hire a qualified candidate.

When one hears the sentences in (15) out of context, one is likely to understand a meaning paraphrasable as in (16).

- (16) a. If John encountered a debutante (at the party), he would dance with her.
b. If Mark reviewed/interviewed a qualified candidate, he would hire him or her.

There are a number of different possible paraphrases for these antecedents, depending on what the indefinite noun phrase is and our world-knowledge of such things, but they all involve a common theme. They all involve the hypothetical case in which some exemplar of the noun phrase comes to have a property which makes it possible for the rest of the sentence to happen to it, whereas in the actual world this was somehow impossible. The simplest case of this, of course, is where no exemplars of the noun phrase exist at all, and the hypothetical circumstance is where they do. But another common case is where ex-

emplars do exist, but they are not currently in contact with the subject of the sentence, whereas in the hypothetical circumstance they are.

The most natural paraphrase of such IC's always contains the indefinite in the antecedent, as well as a pronoun in the consequent clause referring back to this indefinite. This type of paraphrase is more natural than an alternative paraphrase where the indefinite does not appear in the antecedent, just as (7) is a better paraphrase for (6a) than (9) is; that is, it is the paraphrase that requires much less prior contextual knowledge. As an illustration, consider (17).

- (17) John would dance with a debutante.
a. If John encountered a debutante, he would dance with her.
b. If John were a more social person, he would dance with a debutante.

Paraphrase (17a) seems to be the far more natural one; it is the one which comes to mind when one hears (17) with minimal context. And it is the one that has the indefinite noun phrase in the antecedent, and a corresponding pronoun in the consequent clause. Paraphrase (17b), on the other hand, would only be judged as the interpretation of (17) if considerable contextual, especially conversational, background were assumed. Moreover, this paraphrase has a different structure, with the indefinite noun phrase in the consequent, and the antecedent wholly unrelated to the indefinite noun phrase in the IC. Indeed, except for the pronoun switch, the consequent clause in (17b) is largely a copy of the entire IC.⁴

⁴ It also seems that different intonations of (17) make one or the other of the paraphrase-types given in (17a-b) more likely as the intended interpretation. This pattern does not seem to have a parallel in the case

The vagueness of this guideline for forming the antecedent of an IC when there is an indefinite should remind us of the vagueness of (8), and we might consider employing a rather similar principle here, with one important difference: the indefinite noun phrase should be mentioned as being central to the antecedent in the case of sentence-internal ICs.

- (18) **Sentence-Internal Antecedent-Filling:** The most contextually neutral interpretation for an IC containing an indefinite noun phrase is an interpretation best paraphrased by a full conditional where the indefinite noun phrase appears in the antecedent, and a corresponding pronoun appears in the consequent.

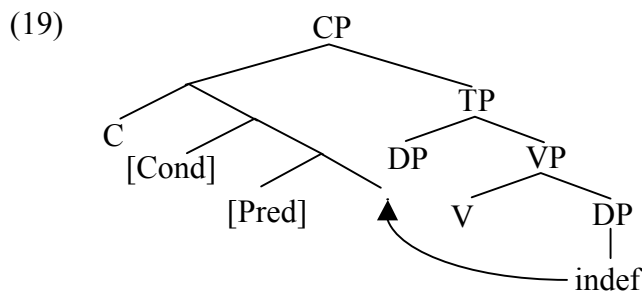
The reason a different principle is needed for sentence-internal ICs is that the paraphrases, as in (16), have pronouns in the consequent clauses, which are pronouns dependent on the indefinite in the antecedent. In order to construe ICs this way, we will need some way in our analysis to refer directly to the indefinite. Such a structure will not be guaranteed by (8) alone.

Generalization (18), coupled with the presence of pronouns in the paraphrases, suggests that our semantic analysis of sentence-internal ICs should formally capture the idea that the indefinite plays an important role in the understood antecedent. The analysis defended in this thesis accomplishes this straightforwardly, by syntactically shifting the indefinite from the interior of the VP to a peripheral position before sending the sentence to interpretation (at the syntactic level of Logical Form). This gives a structure which can more readily be given an interpretation similar to that of the paraphrases, because it

of ICs which do not contain indefinites. This raises the question of how intonation and context interact in choosing the interpretation.

places the indefinite in a position where a conditional operator can interpret it as a restrictor. The structural schema is as in (19).

I shall refer to the structure containing the [Cond] and [Pred] elements as the “conditional left periphery”. These elements are explained below. The actual C head, I assume, is null, both semantically and phonetically; it exists just to drive the syntactic derivation. It corresponds to the element *if* in full conditionals, which I assume is, of course, phonetically realized, but is still semantically vacuous. In future trees, I leave this element out when it is both semantically and phonetically null, for reasons of space.



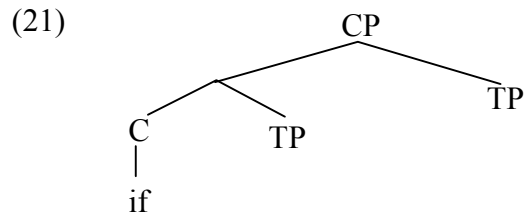
The movement here is *sideward movement*, that is, movement to a non-c-commanding position (Hornstein 2001, Nunes 1995, 2004, Boeckx 2003, and others). Sideward movement is necessary here in order to get the moved DP to join semantically with the two other operators in the periphery of the clause before combining with the rest of the clause; the specifics of these operations are discussed more fully in the next chapter. As we will also see there, the movement is a copying movement; the base position and the landing site will both be filled with lexical material in the Logical Form. Also note that

the movement can take place just as easily from subject position as object position, as seen in examples like (20), though we will focus on the object case for exemplification.

- (20) a. A yeti would ravage our town.
b. A debutante would dance with John.

[Cond] and [Pred] in (19) are silent elements which I assume are freely available (can be freely inserted) in the left periphery of any IC sentence. (In the case of [Cond], it is probably required in all ICs, while the other element will vary depending on the type of IC and the interpretation we will eventually end up with; see the next chapter.) [Cond] is the conditional operator, an operator which serves as a universal quantifier over possible worlds, and which can come in indicative, hypothetical, or counterfactual flavors, depending on the mood of the sentence. I assume that the [Cond] seen here is in a morpho-syntactic agreement relationship with the mood marker *would*, whereas *would* itself has no semantics. (The present thesis focuses on the weakly counterfactual or hypothetical case, the type which Iatridou (2000) has called “future less vivid”.) [Pred] is a predicate which will say something about the moved DP. Its exact semantics will be decided by the context. For example, in (13a), where the indefinite DP would be *a unicorn*, the identity of [Pred] will be the property of existing, so that the interpretation of the antecedent will be “if a unicorn existed”. In (15a), with the DP *a debutante*, we will have a more complex meaning for [Pred], roughly “the property of being encountered by John”, so that the antecedent will mean “if John encountered a debutante”, etc.

The structure in (19) is parallel to the structure I assume for an overt conditional, which will simply have the complementizer *if* where the covert [Cond] is in ICs:



I remain neutral, however, on the question of whether *if* really is the morpheme which carries the semantics of [Cond], or whether it is some other element which does this, while *if* is semantically vacuous. I choose the latter option for explanations below, but this is a purely expository choice.

2.4. Conclusion

This chapter has laid out the basic data on implicit conditionals, with a focus on which readings are available for certain classes of examples. The readings have been presented in terms of a particular type of paraphrase, which I believe accurately disambiguates the readings involved, but which also suggests a particular type of formal analysis for the ICs. In the next chapter I turn to the analysis that I favor, which produces interpretations which are indeed well represented by the paraphrases I have been using, although we must still distinguish interpretations from paraphrases.

Chapter 3

Raising Indefinite DPs in Implicit Conditionals

3.1. Introduction

This chapter lays out the formal groundwork for how to interpret sentence-internal implicit conditionals. I assume the data in chapter 2 to force us to an analysis of these ICs where the indefinite is syntactically recruited to do double-duty as both part of the understood antecedent and the consequent; see chapter 6 for further arguments for this conclusion and against the logically possible alternatives. We start off, in section 3.2, by introducing some of the general formal mechanisms we will use. Many of these are adaptations of mechanisms used elsewhere in the semantic literature, but some particular choices will be made explicit. In addition, there are some mechanisms that are introduced to deal with the IC construction in particular, though they are modeled on previous analyses of conditional structures in general. In section 3.3 I turn to the syntactic mechanisms that will give rise to the structures for implicit conditionals that will allow them to be interpreted correctly. Since the semantic mechanism we want has the indefinite interpreted both in the antecedent and in the consequent, the syntactic mechanism we will adopt involves copying movement. Then, section 3.4 turns to sentence-external ICs and investigates how we understand the antecedent in that construction.

3.2 Semantic Ontology and Assumptions

In this section I introduce the semantic apparatus that I use to interpret sentences in general, and conditional sentences in particular. Since implicit conditionals are viewed as having many properties of donkey conditionals, we must use the type of apparatus that can interpret indirect binding. The type of apparatus I use is the situation-semantic analysis, introduced for canonical donkey sentences by Heim (1990) (cf. also Elbourne 2002). Additionally, since the ICs that I am looking at are counterfactual, we need to use an analysis of counterfactual conditionals in general. The analysis for counterfactuals that I use is inspired by Lewis 1972 and Kratzer 1989.

Before we present the analysis of ICs in its full form, we must establish some of the tools we will use in the analysis. They are mostly fairly standard elements of compositional semantic analysis, but certain particular choices have been made in some cases. For example, I adopt a purely syntactic view of possible worlds and situations, in which there are pronouns in the syntax which denote possible worlds and situations, and lexical items such as nouns and verbs are typed so that they can take situations as arguments. For example, nouns are not of type $\langle e, t \rangle$, as in some types of traditional notation, but of type $\langle s, \langle e, t \rangle \rangle$.

On the syntactic side of this, I assume that situation- and possible world-arguments are represented as overt pronouns in the syntax, pronouns of type s . These pronouns can be inserted freely anywhere by the syntax, but their insertion is limited by type-theoretic

considerations; a situation pronoun will cause a semantic crash unless it is inserted next to a predicate which takes situations as arguments, such as a property of type $\langle s, \langle e, t \rangle \rangle$ or a proposition of type $\langle s, t \rangle$.

I adopt an analysis of conditionals which is largely a combination of the analyses in Kratzer 1989 and Lewis 1973. However, I make some modifications to both, in order to implement situations as participating in the analysis of conditionals. Thus, certain parts of my analysis of conditional semantics in general are new.

My syntactic assumptions are also nontraditional, in that I introduce two silent elements not normally assumed, [Pred] and [Cond]. Their role is to provide a conditional semantics without there being overt material to form a conditional operator or antecedent proposition. Their semantics, however, will not be controversial; [Cond] will be defined as a fairly standard conditional operator (except for the modifications mentioned above regarding situations), while [Pred] will be interpreted as a property, essentially the same type of denotation that a VP receives.

3.2.1. General Background and Assumptions.

In this section we will review the general tools that I use in semantic analysis, excluding those tools specifically used for conditional semantics; the latter is the topic of the next section.

I assume that possible worlds are included in the syntax as pronouns. The denotations I give to NPs and other phrases are designed to overtly take situation arguments as well as

individual-type arguments. I follow Creswell 1990, Percus 2000, and others in positing a syntax with overtly-represented situation-type pronouns, which, like individual-type pronouns, are interpreted by an assignment function, either deictically or bound by an operator; see below for the mechanics of this interpretation.

Bare NPs, such as *unicorn*, are then interpreted as follows. First the NP combines with the situation pronoun to yield an extensional predicate. The type I assume for a noun is slightly more complex than the traditional $\langle e, t \rangle$ type, because in the overt situation-pronoun system, a noun combines first with a situation to then form a type- $\langle e, t \rangle$ predicate. The interpretation of the situation pronoun receives its denotation from the assignment function, which, contra traditional assumptions, takes both a number and a type as its arguments and returns an entity of that type. I discuss the assignment function further below.

- (22) a. $\llbracket \text{unicorn} \rrbracket = \lambda s \lambda x \text{ x is a unicorn in s}$
 b. $\llbracket s_{\langle 2, s \rangle} \rrbracket^g = g(2, s)$ (which will be a situation, type s)
 c. $\llbracket s_{\langle 2, s \rangle} \text{ unicorn} \rrbracket^g = [\lambda s \lambda x \text{ x is a unicorn in s}](g(2, s)) = \lambda x \text{ x is a unicorn in } g(2, s)$

The definite article receives a standard Fregean semantics.

- (23) $\llbracket \text{the} \rrbracket = \lambda P_{\langle e, t \rangle} \text{ the unique individual x such that } P(x)$

But an indefinite determiner *a* will receive a slightly modified, intensionalized generalized quantifier semantics, again reminiscent of the traditional type, $\langle \langle e, t \rangle, t \rangle$, but modified to allow it to combine with overt situation pronouns. The determiner in my system

combines first with a noun phrase complete with its situation argument, which will be a predicate of type $\langle e, t \rangle$, but then combines with a VP which will be of type $\langle e, \langle s, t \rangle \rangle$, because a VP has not had its situation argument saturated yet.

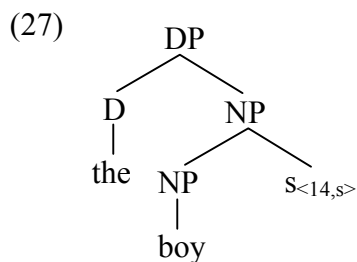
$$(24) \llbracket a \rrbracket = \lambda P1_{\langle e, t \rangle} \lambda P2_{\langle e, \langle s, t \rangle \rangle} \lambda s \exists x P1(x) \wedge P2(x)(s)$$

Finally, verbs and names are interpreted as follows:

$$(25) \llbracket \text{John} \rrbracket = \text{John}$$

$$(26) \llbracket \text{kick} \rrbracket = \lambda y \lambda x \lambda s x \text{ kicks } y \text{ in } s$$

Let us briefly examine how these types of lexical items combine to form a couple of familiar phrases. First, let us compute the noun phrase *the boy*. Syntactically, we have a tree like (27).



Semantically, the interpretation of *boy* is:

(28) $[[\text{boy}]] = \lambda s \lambda x \text{ x is a boy in s}$

We combine it with the situation pronoun to yield:

(29) $[[\text{boy } s <14, s>]]^g = [\lambda s \lambda x \text{ x is a boy in s}](g(14, s)) = \lambda x \text{ x is a boy in } g(14, s)$

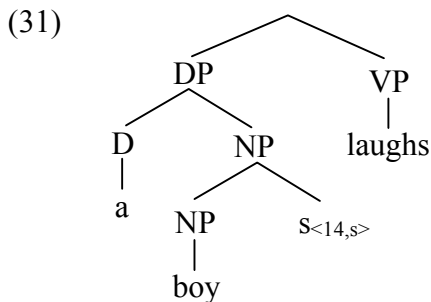
Finally, we add the definite article:

(30) $[[[\text{the } [\text{boy } s <14, s>]]]]^g = [\lambda P_{\langle e, t \rangle} \text{ the unique individual x such that } P(x)](\lambda x \text{ x is a boy in } g(14, s)) = \text{the unique individual x such that x is a boy in } g(14, s)$

In the end, the phrase *the boy* ends up denoting simply an individual, as we wanted.

Which individual it denotes is dependent on which situation the assignment function assigns to the pair $\langle 14, s \rangle$, and of course, if there is no boy in $g(14, s)$, then the phrase fails to denote.

Let us now interpret a more complex phrase, the sentence *a boy laughs*. The structure will be:



The denotation of *laughs* will be as in (32):

$$(32) \llbracket \text{laughs} \rrbracket = \lambda x \lambda s x \text{ laughs in } s$$

The higher NP node is calculated as before:

$$(33) \llbracket \text{boy } s \langle 14, s \rangle \rrbracket^g = [\lambda s \lambda x x \text{ is a boy in } s](g(14, s)) = \lambda x x \text{ is a boy in } g(14, s)$$

The determiner *a* is then applied to this NP:

$$(34) \llbracket [a \text{ boy } s \langle 14, s \rangle] \rrbracket^g = [\lambda P1_{\langle e, t \rangle} \lambda P2_{\langle e, \langle s, t \rangle} \lambda s \exists x P1(x) \wedge P2(x)(s)](\lambda x x \text{ is a boy in } g(14, s)) = \lambda P2_{\langle e, \langle s, t \rangle} \lambda s \exists x x \text{ is a boy in } g(14, s) \wedge P2(x)(s)$$

Finally, we apply the resulting function to the denotation of *laughs* to get the proposition:

$$(35) \llbracket \llbracket [a \text{ boy } s \langle 14, s \rangle] \text{ laughs} \rrbracket \rrbracket^g = [\lambda P2_{\langle e, \langle s, t \rangle} \lambda s \exists x x \text{ is a boy in } g(14, s) \wedge P2(x)(s)](\lambda x \lambda s x \text{ laughs in } s) = \lambda s \exists x x \text{ is a boy in } g(14, s) \wedge x \text{ laughs in } s$$

This is a possible interpretation of the sentence, where the noun phrase *a boy* is interpreted relative to a different possible situation than the main sentence is. Below, however, we will derive the interpretation where they are (necessarily) interpreted relative to the same world.

The situation pronoun that we supply to the NP in an IC must not be a deictic pronoun, but must be co-bound with the situation variable which serves as the main world of

evaluation for the consequent, as we will see. Following arguments in Schueler (2008), this binding will be done not by a free predicate abstractor, but by a binding operator for situations modeled after the β operator proposed in Buring (2004).

Buring argues for a distinction between the operator which accomplishes semantic binding of pronouns from the operator which accomplishes semantic binding of traces of movement. The primary argument is that without such a distinction, it is unclear how basic weak crossover effects could be captured. The weak crossover phenomenon is essentially that a DP which undergoes A-bar movement cannot bind a pronoun which its highest A-position trace does not already bind. The distinction between pronoun-binding and trace-binding allows a further constraint to be imposed, namely that the pronoun-binding operator can only be inserted in an A-position, while the trace-binding operator can and must be inserted whenever there is movement, either A movement or A-bar movement.

Schueler 2008 extends the binding operator to possible-world pronouns. The argument for this is not directly connected to the weak crossover arguments, but to a different generalization about possible world pronouns, namely the facts noticed by Percus (2001). Percus notices that, under the general theory that there exist pronouns in the syntactic structure denoting possible worlds, coupled with the assumption, which I (Schueler 2008) argue against, that the binding is accomplished by freely inserted λ -abstractors, an asymmetry exists between which possible world pronouns can be bound non-locally and which must be bound by the nearest λ -operator. I show that if we disallow freely inserted λ -abstractors, and instead assume that possible world pronouns, like individual-denoting pronouns, can only be bound by β operators with a semantics parallel to that in Buring

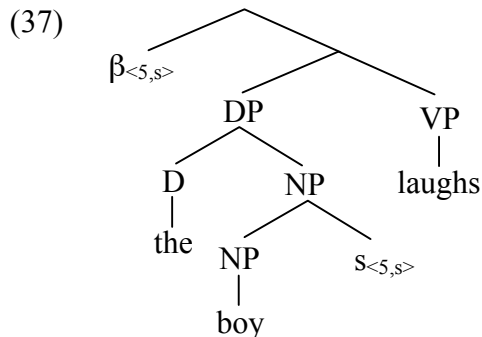
2004, then the generalizations that Percus notices follow automatically without stipulated constraints on locality.

β is an operator which enables pronoun-type binding; it takes a structure X of type $\langle \tau, x \rangle$, x any type, with a pronoun of type τ somewhere within it, and returns a new structure, still of type $\langle \tau, x \rangle$, but where whatever element Y of type τ that X is merged to will now also fill in the denotation of the pronoun within X . The use of this type of operator, as distinct from the one which interprets movement structures, is motivated in Büring 2004 as part of his analysis of weak crossover. I use it here, however, for possible worlds as well. Other operators or binding mechanisms could also be used without cost to the results. The β operator, like situation pronouns, can be inserted anywhere as far as the syntax is concerned, but will be semantically constrained; it can only be inserted on top of a function which takes arguments of the same type that the β is indexed with.

Like the assignment function, the β operator will be generalized to apply to any type; any given β operator will be indexed with both a type and a natural number.

$$(36) \llbracket \beta_{\langle n, \tau \rangle} XP \rrbracket^g = \lambda x_\tau \llbracket \llbracket XP \rrbracket^{g[\langle n, \tau \rangle \rightarrow x]}(x) \rrbracket$$

Let us see how the β operator works in the simple sentence *the boy laughs*. We will now provide a world pronoun to the sentence, the “actual world”, and we will use the β to bind the world pronoun associated with the noun phrase *the boy* to the actual world, so that both the noun phrase and the sentence are evaluated with respect to the same possible world.



Here, the β operator is crucial to the interpretation of everything after it. Applying the definition in (36), we have:

$$\begin{aligned}
 (38) \quad & \llbracket \beta_{\langle s, s \rangle} \llbracket \llbracket \text{the} \llbracket \text{boy } s_{\langle s, s \rangle} \rrbracket \rrbracket \text{laughs} \rrbracket \rrbracket^g = \lambda s \llbracket \llbracket \llbracket \llbracket \text{the} \llbracket \text{boy } s_{\langle s, s \rangle} \rrbracket \rrbracket \text{laughs} \rrbracket \rrbracket^{g[\langle s, s \rangle \rightarrow s]}(s) \\
 & = \lambda s \llbracket \llbracket \llbracket \text{laughs} \rrbracket \llbracket \llbracket \text{the} \rrbracket \llbracket \llbracket \text{boy} \rrbracket \llbracket \llbracket s_{\langle s, s \rangle} \rrbracket \rrbracket^{g[\langle s, s \rangle \rightarrow s]} \rrbracket \rrbracket (s) \\
 & = \lambda s \llbracket \llbracket \llbracket \text{laughs} \rrbracket \llbracket \llbracket \text{the} \rrbracket \llbracket \llbracket \text{boy} \rrbracket (s) \rrbracket \rrbracket (s) \\
 & = \lambda s \llbracket \llbracket \llbracket \text{laughs} \rrbracket \llbracket \llbracket \text{the} \rrbracket (\lambda x \text{ } x \text{ is a boy in } s) \rrbracket \rrbracket (s) \\
 & = \lambda s \llbracket \llbracket \llbracket \text{laughs} \rrbracket (\text{the unique individual } x \text{ such that } x \text{ is a boy in } s) \rrbracket \rrbracket (s) \\
 & = \lambda s \llbracket \llbracket \lambda x \lambda s' \text{ } x \text{ laughs in } s' \rrbracket (\text{the unique individual } x \text{ such that } x \text{ is a boy in } s) \rrbracket \rrbracket (s) \\
 & = \lambda s \llbracket \llbracket \lambda s' \text{ the unique individual } x \text{ such that } x \text{ is a boy in } s \text{ laughs in } s' \rrbracket \rrbracket (s) \\
 & = \lambda s \text{ the unique individual } x \text{ such that } x \text{ is a boy in } s \text{ laughs in } s
 \end{aligned}$$

3.2.2. Semantics of Conditionals

This subsection outlines the assumptions I make about the semantic elements used to analyze conditional sentences. Section 3.2.2.1 introduces the elements necessary for conditionals in general, although some of the treatment is slightly different from anything found in the previous literature. Section 3.2.2.2 gives the semantics of those elements, mainly [Pred] and [Cond], which I introduce in this thesis specifically to analyze ICs.

3.2.2.1. Background: Semantics of Conditionals, Full and IC

We now switch to the semantic tools I use for the analysis of conditionals in general. I focus on counterfactual conditionals, since the type of ICs that I study in this thesis all have a counterfactual semantics. First, I refer to possible world and situations, which are of type s , where a situation is a part of a world, according to a primitively given partial ordering on situations, symbolized \leq , obeying the following basic ontology, from Kratzer 1989.

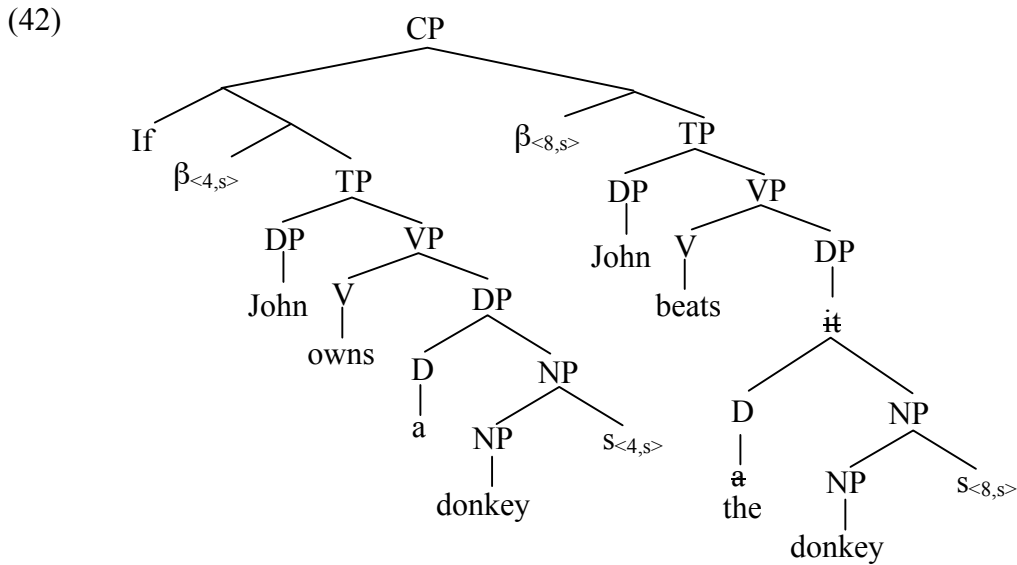
- (39) Basic Ingredients for Situations (Kratzer 1989, pgs. 614-615, modified slightly)
- a. S , the set of possible situations
 - b. \leq , a partial ordering on S such that for all $s \in S$ there is a unique $s' \in S$ such that $s \leq s'$ and for all $s'' \in S$: if $s' \leq s''$, then $s'' = s'$
 - c. $\wp(S)$, the power set of S , the set of propositions
 - d. W , a subset of S , the set of maximal elements with respect to \leq . W is referred to as the **set of possible worlds**.
 - e. For all $s \in S$, let w_s be the **maximal element** that s is related to by \leq . In other words, for all $s \in S$, let w_s be the unique s' such that $s \in s'$ and $s' \in W$.
 - f. A situation s is a **maximal element** with respect to \leq (and hence is a **possible world**) if there is no s' such that $s' \neq s$ and $s \leq s'$.

The use of situations, following Heim 1990, von Stechow 1994, and many others, allows us to capture the uniqueness effect that we find in sentence-internal ICs. The analysis will be quite similar to that of donkey sentences found in Heim 1991. There, we interpret (40a) as loosely paraphrased in (40b).

- (40) a. If a farmer has a donkey, he beats it.
b. Every minimal situation s such that a farmer and a donkey exist in s is extendible to (is part of) a situation s' such that the (unique) farmer in s' beats the (unique) donkey in s' .

- (41) For any proposition p , the *minimal situations such that* p are those situations s such that p is true of s and there is no s' such that $s' \neq s$, p is true of s' , and $s' \leq s$.
 $(\forall p_{\langle s,t \rangle} \min(p) =_{df} \lambda s p(s) \wedge \neg \exists s' [s' \neq s \wedge p(s') \wedge s' \leq s])^5$

The structure for basic donkey sentences on the situation analysis is then (42).



In (40) the minimality operator limits consideration to only those situations involving just one farmer and one donkey. This in turn ensures that the uniqueness presuppositions of

⁵ The minimality-of-situation analysis of donkey sentences is not without some problems. First, for a case like (i), the analysis predicts that the sentence is true if a) there are some farmers who own multiple donkeys, all of which farmers beat all of their donkeys. It conversely predicts (i) to be false if b) some farmers own multiple donkeys and beat only some of them. These are the correct judgments for some speakers, but others find (i) to induce presupposition failure in either situation a), situation b) or both.

- (i) If a farmer owns a donkey, he beats it.

Capturing the range of judgments available here is a difficult task, given the variation observed. Alternative analyses, such as DRT theories, are incapable of generating the readings of speakers who agree with the situation analysis's predictions. I therefore assume the minimality-of-situation analysis because of its advantages in capturing many of the readings available in donkey sentences.

the definite DPs in the consequent, which are the expansion of an E-type pronoun, will be met.

I will also introduce here a silent conditional operator, [Cond], formalized essentially as a function from propositions to functions from propositions to truth values, or a relation between propositions. It is similar to the operator that Kratzer (1981) uses for “bare conditionals”, and it can be viewed as the possible-world version of *every*. That is, where *every* is a relation between properties (of individuals), stating specifically that individual such that one property is true of it is such that the other property is true of it, [Cond] is a relation between propositions, which are essentially properties of possible worlds, stating that every possible world such that one proposition is true of it is such that the other proposition is true of it. We are going to essentially follow Lewis’s (1973, 1979) analysis of counterfactual conditionals, but augment it with an understanding of situation semantics as in Kratzer 1989. The counterfactual situations considered in the first place (i.e. at the point of the antecedent) are those situations which, among those which make the antecedent proposition true, are the closest (otherwise) to the actual world (or world of evaluation). I symbolize this notion with a relation, *ClosestSituations*, as in (45). This definition makes use of a more primitive notion, a notion of closeness defined only for pairs of possible worlds, not all situations.

We define a primitive notion of “closer”. This is essentially the definition found in Lewis. I change the notation a bit, because the earlier work uses the symbol \leq for closeness, and I reserve the symbol \leq for the “part of” relation between situations. Every world is the closest to itself, and beyond that, given a world w_1 , and two more worlds w_2 and

w3, either w2 is closer to w1 than w3 is, or w3 is closer to w1 than w2 is, or neither. We formalize this with a predicate $closer(w1, w2, w3)$, which is true if and only if w2 is closer to w1 than w3 is.

We then define the notion of *closest world*, which picks out, for a given world w1 and a proposition p, the worlds which are p-worlds and which are closer to w1 than any other p-world. This too is essentially that found in Lewis.

$$(43) \text{ClosestWorlds} = \lambda p \lambda w \lambda w' [p(w') \wedge \neg \exists w'' [p(w'') \wedge w'' \neq w' \wedge closer(w, w'', w')]]$$

Finally, we need to extend the notion of “closeness” to define the closest *p-situations* to a given *situation*. This element is not found in Lewis’s work, and is done differently in Kratzer’s. We cannot simply apply the definitions above to situations which are not possible worlds. We use the symbol “ClosestSituations” to pick out those situations which are part of closest p-worlds. We use the function W to pick out the (unique) world of which a given situation is part:

$$(44) W = \lambda s \text{ the unique possible world } w \text{ such that } s \leq w$$

$$(45) \text{ClosestSituations} = \lambda p \lambda s \lambda s' \exists w' [p(s') \wedge s' \leq w' \wedge w' \in \text{ClosestWorlds}(p)(W(s))]$$

(45) can be paraphrased thus: given a proposition p and a situation s , the function *ClosestSituations* returns the set of situations s' , such that p is true of s' , and each s' is part of a world w' which is a closest p -world (by (43)) to the world of which s is a part.

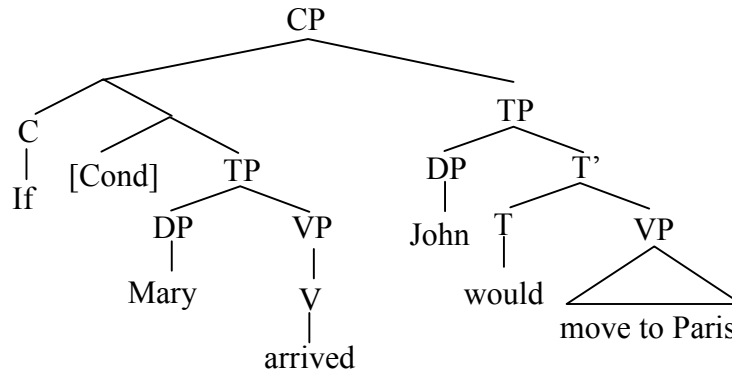
The [Cond] operator will make use of *minimal* situations as defined in (41); it asserts that each closest minimal situation which makes the antecedent true is *part of* a situation (or, extendible to a situation) which makes the consequent true.

$$(46) \llbracket \llbracket \text{Cond} \rrbracket \rrbracket = \lambda p_{\langle s, t \rangle} \lambda q_{\langle s, t \rangle} \lambda w \forall s [\text{ClosestSituations}(\min(p))(w)(s) \rightarrow \exists s' [s \leq s' \wedge q(s')]]$$

This element has the same semantics as the operator that would drive the interpretation of a full counterfactual conditional. As I mentioned above, I remain neutral here as to exactly which element in the syntax bears this semantics in overt conditionals. For ease of explication, let us assume that it is in fact the same element, a silent operator [Cond], that accomplishes this, which is again in agreement with the mood marker *would*. The element *if* on this model is semantically vacuous, like *would*. So let us take (47) as our example. It has a structure as in (48).

(47) If Mary arrived, John would move to Paris.

(48)



(48) is interpreted as follows. The denotation of the antecedent TP *Mary arrived* is as in (49).

(49) $\llbracket \text{Mary arrived} \rrbracket = \lambda s \text{ Mary arrived in } s$

This is combined with the [Cond] operator:

- (50) a. $\llbracket \llbracket \text{Cond} \rrbracket \llbracket \text{Mary arrived} \rrbracket \rrbracket =$
 b. $\llbracket \lambda p_{\langle s,t \rangle} \lambda q_{\langle s,t \rangle} \lambda w \forall s [\text{ClosestSituations}(\min(p))(w)(s) \rightarrow \exists s' [s \leq s' \wedge q(s')]] \rrbracket (\lambda s'' \text{ Mary arrived in } s'') =$
 c. $\lambda q_{\langle s,t \rangle} \lambda w \forall s [\text{ClosestSituations}(\min(\lambda s'' \text{ Mary arrived in } s''))(w)(s) \rightarrow \exists s' [s \leq s' \wedge q(s')]]$

This then combines with the consequent TP, *John move to Paris*. The denotation of the latter is:

(51) $\llbracket \llbracket \text{John [move to Paris]} \rrbracket \rrbracket = \lambda s_3 \text{ John moves to Paris in } s_3$

So the combination of the antecedent and the consequent yields:

- (52) a. $\llbracket \llbracket \text{If } \llbracket \text{Cond} \rrbracket \llbracket \text{Mary arrived} \rrbracket \rrbracket \llbracket \text{John } \llbracket \text{move to Paris} \rrbracket \rrbracket \rrbracket =$
 b. $\llbracket \lambda q_{\langle s, t \rangle} \lambda w \forall s [\text{ClosestSituations}(\min(\lambda s'' \text{ Mary arrived in } s''))(w)(s) \rightarrow \exists s' [s \leq s' \wedge q(s')]] \rrbracket (\lambda s \exists \text{ John moves to Paris in } s) =$
 c. $\lambda w \forall s [\text{ClosestSituations}(\min(\lambda s'' \text{ Mary arrived in } s''))(w)(s) \rightarrow \exists s' [s \leq s' \wedge \text{John moves to Paris in } s']]$

(52c) is the denotation of the full conditional. It can be paraphrased technically as in (53).

- (53) The set of worlds w such that for every situation s which is a closest minimal situation to w for the proposition that Mary arrived, s is extendible to a situation s' such that John moves to Paris in s' .

3.2.2.2. Semantic Elements Specific to ICs

We now return to semantic elements introduced here specifically for ICs. As was briefly mentioned in chapter 2, I introduce here a silent element $[\text{Pred}]$ in the left periphery, which will be interpreted as a property. Such an element has not to my knowledge been used previously in the literature, but its presence in some form is probably necessary for heavily context-dependent sentences. Precisely which property a $[\text{Pred}]$ element denotes depends on the context. For example, anticipating the analysis of sentences like (13), we will assume in those types of sentences that it is interpreted as the property of existence:

- (54) $\llbracket \llbracket \text{Pred} \rrbracket \rrbracket = \lambda x \lambda s x \text{ exists in } s$

However, in order to give it that meaning in context, [Pred] must actually be a *pronoun* of type $\langle e, \langle s, t \rangle \rangle$. As a pronoun, [Pred] will be indexed, and its interpretation will be determined by an assignment function, in a manner which we now specify.

Assignment functions, then, must be able apply to pronouns of various semantic types and yield a denotation of the corresponding type. I assume that an assignment function is a function from a pair, of an index and a type, to a denotation of the corresponding type. This is a departure from the standard treatment, where the domain of an assignment function is just the set of natural numbers. The augmentation of its domain to pairs of numbers and types is motivated by the need to have pronouns of multiple types; cf. Schueler 2008.

Every pronoun and trace, meanwhile, is indexed with both a natural number and its type. So, for example, the pronoun *him* may be indexed $\langle 6, e \rangle$. In a context where the assignment function takes this pair to the individual Chris, we will have the following interpretation:

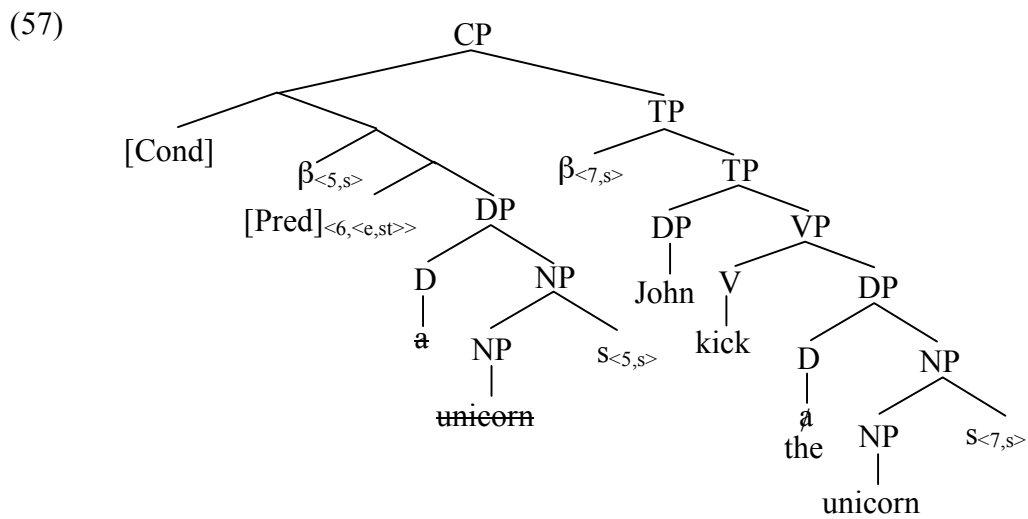
$$(55) \llbracket he_{\langle 6, e \rangle} \rrbracket^g = g(6, e) = (\text{in context}) \text{Chris}$$

Thus, in the case of [Pred] in the context we are assuming, we will have:

$$(56) \llbracket [\text{Pred}]_{\langle 6, \langle e, \langle s, t \rangle \rangle} \rrbracket^g = g(6, \langle e, \langle s, t \rangle \rangle) = (\text{in context}) \lambda x \lambda s x \text{ exists in } s$$

The β operator, introduced above as the element which allows semantic binding to take place, will be attached at the top of the consequent clause, and as (36) shows, the result is a proposition, which will then serve as one of the arguments to [Cond].

So the syntactic structure for (59) will be as in (57). Here the ~~font~~ indicates nonpronunciation, while the superimposed slash indicates the trace conversion of an article, which is pronounced *a* but interpreted as *the*. Since the element *would* doesn't play a role in the semantics, since by assumption it is simply a mood marker indicating agreement with the [Cond] operator, I will not show it subsequently in trees which feed interpretation.



The semantics for the entire tree is as in (58). To paraphrase, the entire tree denotes the set of possible worlds w_0 such that the closest minimal unicorn-existing situations s to w_0 are parts of situations s'' such that John kicks, in s'' , the unicorn in s'' . This is the pro-

positional form; a situation pronoun for the world of evaluation (actual world) will be attached at the very top of the tree.

$$(58) \llbracket (57) \rrbracket = \lambda w_0 \forall s [\text{ClosestSituations}(\min([\lambda s' \exists x \text{ x is a unicorn in } s']))(w)(s) \rightarrow \exists s'' [s \leq s'' \wedge \text{John kicks, in } s'', \text{ the unique unicorn in } s'']]$$

This is equivalent to our preferred paraphrase for the sentence, (14a).

(57) is the final LF tree for the sentence-internal reading. This section has introduced the semantic tools we need to properly interpret such a structure. We now turn to the syntactic tools we need to derive this LF from the surface structure, which we assume to be a traditional structure.

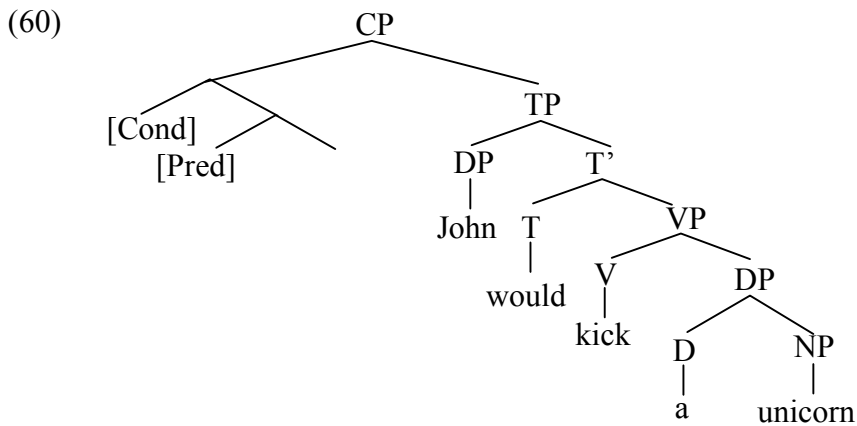
3.3. Syntactic Analysis of Sentence-Internal Implicit Conditionals

In this section I introduce the syntactic mechanism that allows an indefinite in an IC to appear, at logical form, in the left periphery of the structure as an argument of a conditional operator. This allows the indefinite to semantically form part of the antecedent of the understood conditional, rather than having its quantificational force in the consequent. The syntactic method I use to derive this, sideward movement, is controversial in the syntactic literature but derives the right structure to feed the semantic interpretation that we want, in a way that more traditional understandings of movement cannot.

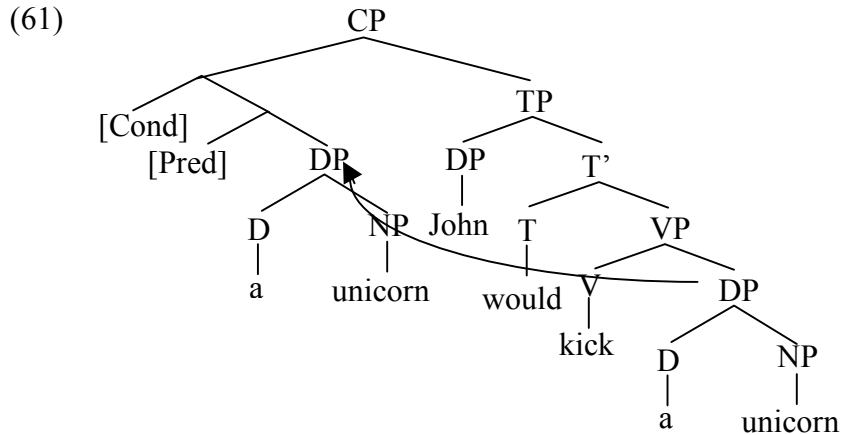
We will assume that the structure for a sentence like (61) on the sentence-internal reading will start out as with standard syntactic analyses, with the exception that the silent op-

erators [Cond] and [Pred] are present, although in the merge/move system within Minimalist syntax, the question of whether silent operators merge before or after Spell-Out may be irrelevant. So the structure starts out as (60). (60) is a simplification of the derivation; in the actual derivation, the left periphery is not merged to the main spine until after the sideward movement of the DP actually takes place; more on this below.

(59) John would kick a unicorn.



But then, we move the indefinite to the position of the sister of [Pred].



3.3.1. Sideward Movement

The movement in (61) is sideward, since it is to a non-c-commanding position. We also assume the copy theory of movement, as argued for by Chomsky (1993, 1995), so that the moved DP leaves a (so far identical, but see below) copy in its original merge position. Sideward movement is motivated by Hornstein (1999) as a way of analyzing control into adjuncts, and by Nunes (1995, 2001) as an analysis of parasitic gaps, and investigated in other work for a variety of constructions and theoretical advantages.

The history of sideward movement in recent theories within the Minimalist Program is connected to the question of the proper analysis of control phenomena, a canonical example of which is (62).

(62) John tried to win.

The theory of PRO was connected intimately with theories of government and binding, as the licensing condition on PRO was that it must, strictly, be neither bound nor unbound in

its governing category, and thus the only way to satisfy both requirements is for PRO to not have a governing category. This proposal is referred to as the PRO theorem. In addition, specifically stipulated rules were required to decide which DP a given instance of PRO would be coindexed with. The mechanism that accomplishes this latter task is called the control module. Thus (62) is analyzed as in (63), and particular rules are required to ensure that PRO is coindexed with *John*.

(63)[John₇ [tried [to [PRO₇ win]]]]

The notion of governing category, however, is unavailable in the version of the Minimalist Program outlined in Chomsky (1993, 1995), and the status of the control module is unclear at best. Hornstein (1999) argues that the most theoretically satisfying way to account for the same facts that the PRO theorem and the control module accounts for, within Minimalist assumptions, is to propose that there is no PRO element at all, and that what was previously analyzed as control constructions actually involved movement, where what used to be analyzed as a PRO element would instead be a trace of the noun phrase that it is construed with.

(64)[John₇ [tried [to [t₇ win]]]]

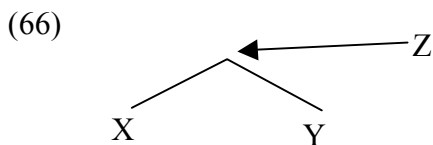


It is well known, however, that control can also take place into adjuncts.

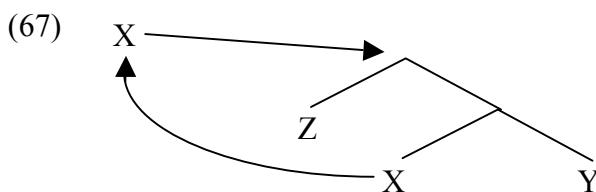
(65) John saw Mary without leaving the room.

In the adjunct case, the subject position of the embedded VP is not c-commanded by the subject of the main clause. Therefore, assuming the other arguments for control as movement still go through, this counts as an argument for sideward movement. I discuss this example more below.

We now take a brief excursus into a few previous analyses involving sideward movement. In the merge-and-move analysis of structure building in the Minimalist program, pieces of structure are merged or moved before the entire structure is built. A phrase X is merged to a phrase Y, then a phrase Z may be merged to the result.

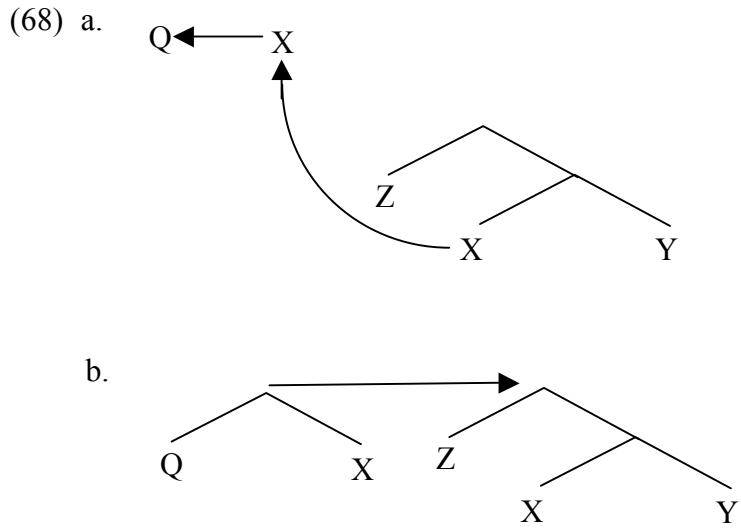


Movement is viewed as copying some subtree of the structure built so far, and then merging it to the top of the structure.

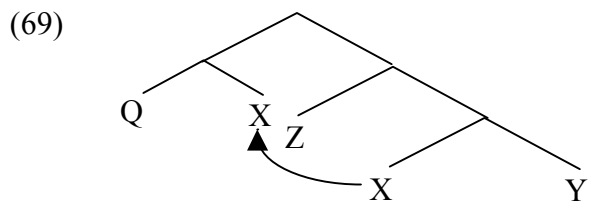


Sideward movement, within the Minimalist program, is seen as a relaxing of the requirement that when a subtree is copied, it must then merge directly with the top of the

structure that has been built so far. Instead, a constituent can be copied, and then merged with some other phrase which has not yet been merged to the structure where the moving phrase came from. Then, the object thus formed, or some larger object built from it, can merge back into the original structure.



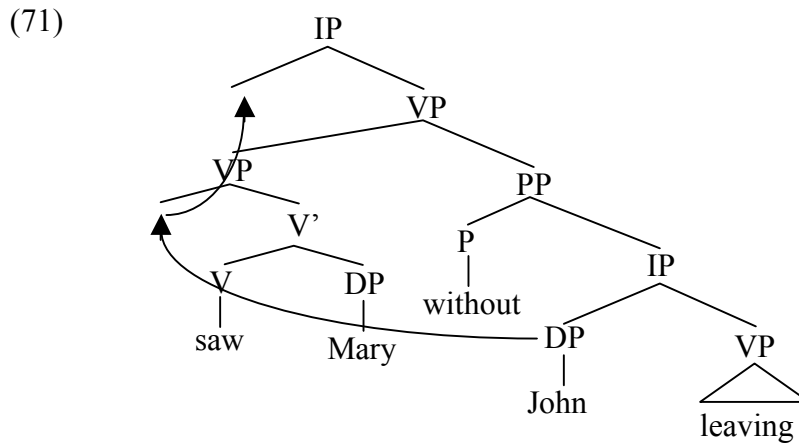
The effect of this process is equivalent to that of moving a constituent directly to a non-commanding position within the same tree. Since that is simpler to illustrate, I will show trees of the sort in (69) from now on, although the actual process has more steps.



In most of this previous literature the sideward movement proposed is overt movement. The schema for control into adjuncts and for parasitic gaps is that a DP moves from an adjunct position into an argument position. For example, take the control-into-adjunct sentence (70).

(70) John saw Mary without leaving the room.

Hornstein analyzes the sentence with the movement shown in (71), though his paper, like the present work, also adopts the copy theory of movement, which we will discuss in further detail below.



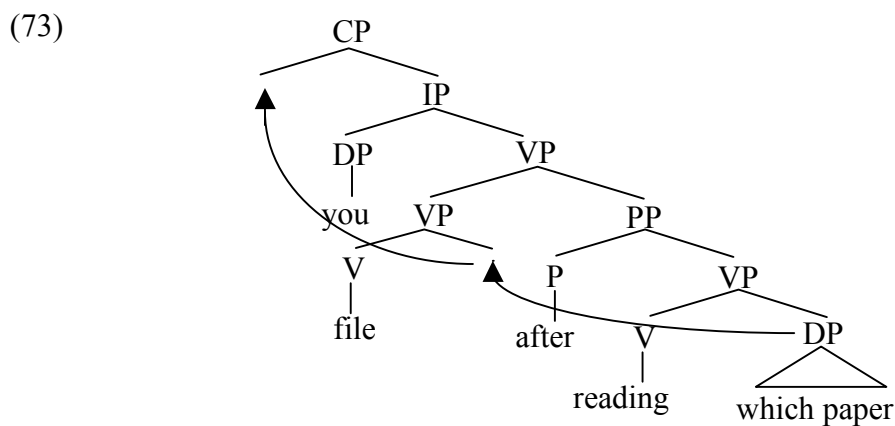
Hornstein rejects the PRO-theory of control, which would assume two distinct elements in the numeration corresponding to the subject of the upper VP and that of the lower. Instead, he argues that all of the subject positions in sentences like (71) are part of a single

chain. Hence, since the VP-internal subject position does not c-command the subject of the gerund within the adjunct PP, the movement involved has to be sideward movement.

Let us look at one more example, the example of parasitic gaps, such as in (72).

(72) Which paper did you file after reading?

This question is analyzed by Nunes roughly as in (73) (with movement of the subject omitted for simplicity).



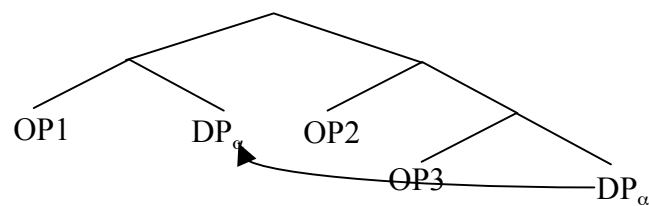
Again, Nunes argues that the argument slots of *file* and *read* in this sentence are filled by members of a single chain. So, *which book* must move sideward from the object position of *reading* to the object position of *file*, before then moving on to spec-CP.

The type of sideward movement assumed for the case of sentence-internal ICs, however, is a covert sideward movement, or in the terms of the copy theory, it is the lower

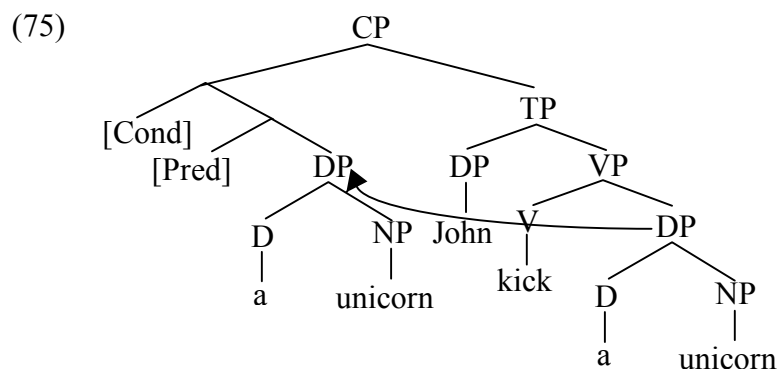
copy which is pronounced. The motivation for the movement to be sideward in the case of ICs is superficially different from the case of adjunct control and parasitic gaps, in that with ICs we are moving a DP covertly into a region of the left periphery occupied only by silent operators. In the case of adjunct control and parasitic gaps, the movement takes the argument of one overt predicate (one verb), and moves it into the argument position of another overt predicate (another verb).

However, the reason why the movement must be sideward is similar in both the covert and the overt cases. In both cases, the reason for sideward movement is that different copies of the DP must combine with two different operators in two different places in the tree, before combining with the main projection line. The general configuration involved is (74), where it is assumed that, to get the right interpretation, the unmoved copy of DP_α must combine with OP3 before combining with OP2, and the moved copy of DP_α must combine with OP1 before combining with the rest of the structure built so far. We assume that the OPs are in a fixed hierarchy, in particular that OP1 must be merged higher than OP2, and OP2 must be higher than OP3. Therefore, movement of the DP_α to a c-commanding position is not an option, since it would necessarily cause the moved copy of DP_α to combine with the entire structure built so far, rather than combining just with OP1 first.

(74)



Let us then examine how this general schema applies to the case of a sentence-internal IC, exemplified by (75), repeated from (61).



OP1 from (74) would represent the complex of [Cond] and [Pred], while OP2 would represent the subject, the tense, etc., while OP3 represents the verb. The moved copy of DP_{α} has to combine with the complex of [Cond] and [Pred] before combining with the constituent containing the rest of the sentence, including the unmoved copy of DP_{α} .

3.3.2. Trace Conversion

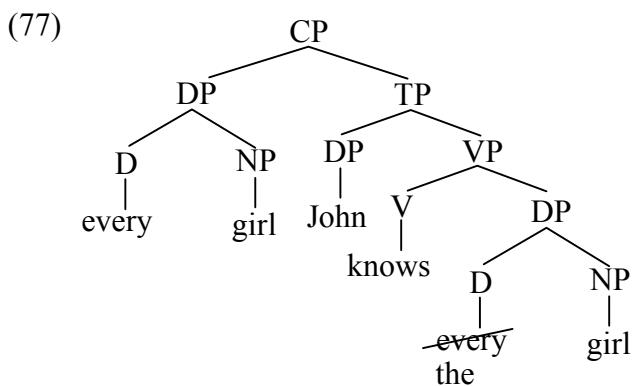
We must also be clear on how we interpret the type of movement we are assuming. While the copy theory of movement in general is attributed to Chomsky (1993, 1995) as an essential component of the Minimalist Program, the proper interpretation of copy chains in the general case, particularly the lower copy of a moved quantified phrase, was explored in detail most notably by Fox (1999), and expanded on by Sauerland (1998, 2004).

According to this theory, the lower copy of the movement of a quantified phrase (and potentially most DPs in general) is always interpreted as a definite description. The process by which this comes to be is not important, but for concreteness, we will assume that at the level of the derivation which feeds interpretation (LF), the lower copy of the determiner itself is changed to a definite article; the NP itself stays the same. Fox (1999) and Sauerland (2004) offer arguments as to why the lower copy of the NP must remain and be interpreted. For our purposes this property will be quite important as well.

Let us look at a standard (non-sideward) case, where the DP moves to a c-commanding position, and hence the moved copy c-commands the lower copy.

(76) John knows every girl.

So far, our assumptions give us (77) as an LF structure for (76).

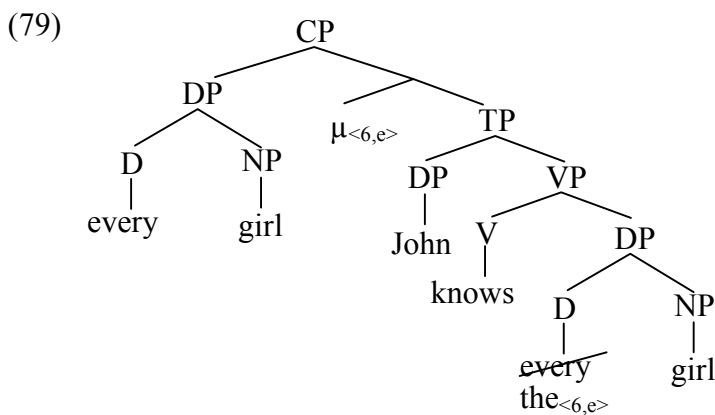


The cross-out of *every* and replacement by *the* represents the operation which gives us a definite description for the lower copy, which we call “trace conversion”. But (77) does

not give us the right interpretation; it is most likely not type-theoretically well formed. We need an operator-variable dependency; we need to somehow interpret the lower copy like a variable, while preserving the contribution of the lower copy of the NP. Sauerland (2004) accomplishes this by introducing an index to the definite article, coindexing it with the movement operator associated with the higher copy of the quantified phrase, and introducing a special interpretation rule for the resulting structure.

We will meanwhile use the μ notation, introduced by Buring (2004), for the predicate abstraction created by the movement. The μ operator is largely equivalent to the syntactically present indices in Heim and Kratzer 1998. However, for our purposes, the μ operator, like the β operator, will be generalized to apply to any semantic type. Hence, the μ operator, as well as the trace-converted definite article that it binds, will be indexed both with a number and a type, namely the type of the lower copy.

$$(78) \llbracket [\mu_{\langle n, \tau \rangle} XP] \rrbracket^g = \lambda_{x_\tau} \llbracket [XP] \rrbracket^{g[\langle n, \tau \rangle \rightarrow x]}$$



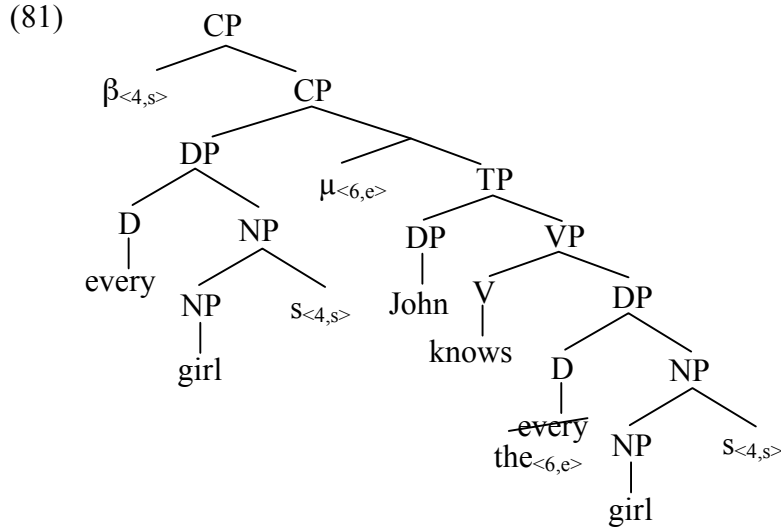
(80) $[[\text{the}_n \text{NP}]]^g$ is defined if $[[\text{NP}]](g(n)) = 1$; where defined, $[[\text{the}_n \text{NP}]]^g = g(n)$

According to (80), the contribution of the lower copy of the NP is presuppositional; for example, in (79) the trace fails to denote if the assignment assigns a non-girl to the number 6. However, in practice presupposition failure will never result, since the index is bound by the movement index which is then taken as an argument by *every girl*. As Sauerland and Fox put it, since *every* (like all known natural language determiners) is a conservative quantifier, there will never be an effect of having its argument be a predicate which is only defined for girls. (More generally, the determiner will not be affected if its nuclear scope is a predicate which presupposes that its argument must be a member of the determiner's restrictive scope.)

Finally, we must revise this picture to include the situation pronouns which we assume are present inside every NP^{6,7}.

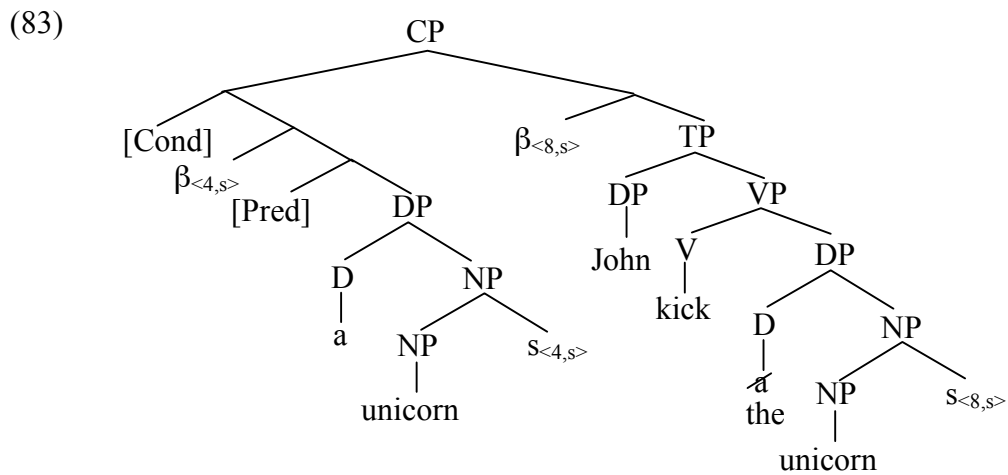
⁶ However, I will not, in this work, further complicate the picture by assuming that quantified phrases like *every man* themselves *quantify over situations*. This latter assumption is necessary to account for *every*-type donkey sentences, as discussed by Heim (1992), Büring (2004), and others.

⁷ A further issue is raised by such movement, under the assumption that situation pronouns are overtly represented. This is the question of what index the two copies of the situation pronouns should have. The issue reappears in the case of sideward movement; I address that case in the main text below. But in the case here, where the movement is to a c-commanding position, in order to get the right interpretations, the two copies of the situation pronoun must have the same index, and must both be bound by the same β operator. I can only speculate here on the constraint which would ensure this; it might be related to constraints on indexing under ellipsis, as mentioned below in the main text, or possibly related to the constraint on the world of evaluation for a choice function, discussed by Reinhart (1997).



We will make further use of this type of indexing later in section 4.3, when we discuss sentence internal ICs with quantifiers other than the indefinite determiner. But for now, we must note that the situation changes when we move the DP sideward. Let us reexamine the structure we get for (59), repeated here as (82).

(82) John would kick a unicorn.



(83) is the final structure for (82), and it is interpreted, semi-formally, as in (84)⁸.

(84) Every situation s such that a unicorn exists in s is extendible to a situation s' such that John kicks, in s' , the unique unicorn which exists in s' .

For this structure, indexing the definite article in the unmoved copy would not be theoretically desirable. This is, essentially, because the moved DP does not c-command its copy. Therefore, it is unclear how it could come to semantically bind the unmoved copy given the mechanisms we are assuming here. In fact, we do not want an operator-variable dependency to obtain here between individuals. I therefore assume, contra Sauerland, that this indexing is optional, and it only applies when it will give a convergent interpretation. Trace conversion, however, must not be optional; we do not want to allow a structure such as (86), where both copies of the DP are interpreted as indefinites. If we did, then we would end up with what von Stechow (1994) terms the *requantification problem*; (82) would be interpreted as paraphrased in (85), a reading it does not have.

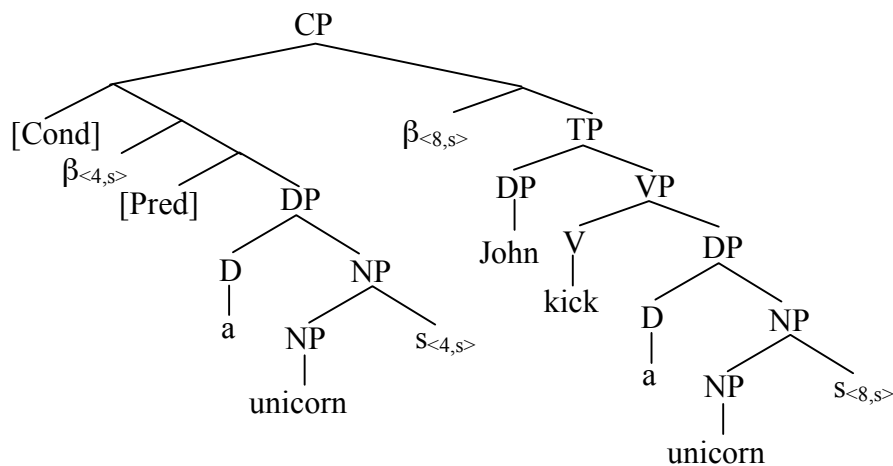
(85) If a unicorn existed, John would kick a unicorn.

⁸ A complication arises when a sentence-internal IC interacts with another quantificational element within the sentence. Consider (i).

(i) Every bachelor would dance with a debutante.

(i) has a natural interpretation where each bachelor, if *that bachelor* encountered a debutante, would dance with the debutante that *that bachelor* encountered. For this to work, the understood antecedent must vary with the quantificational force of *every bachelor*, while *every bachelor* would take wide scope. This can be accomplished if we allow [Pred], in some cases, to be the semantic type of a *relation* rather than a property, and include a covert pronoun, or possibly a trace of movement, which would be bound by *every bachelor*. I leave the precise implementation of this, however, for future work.

(86)



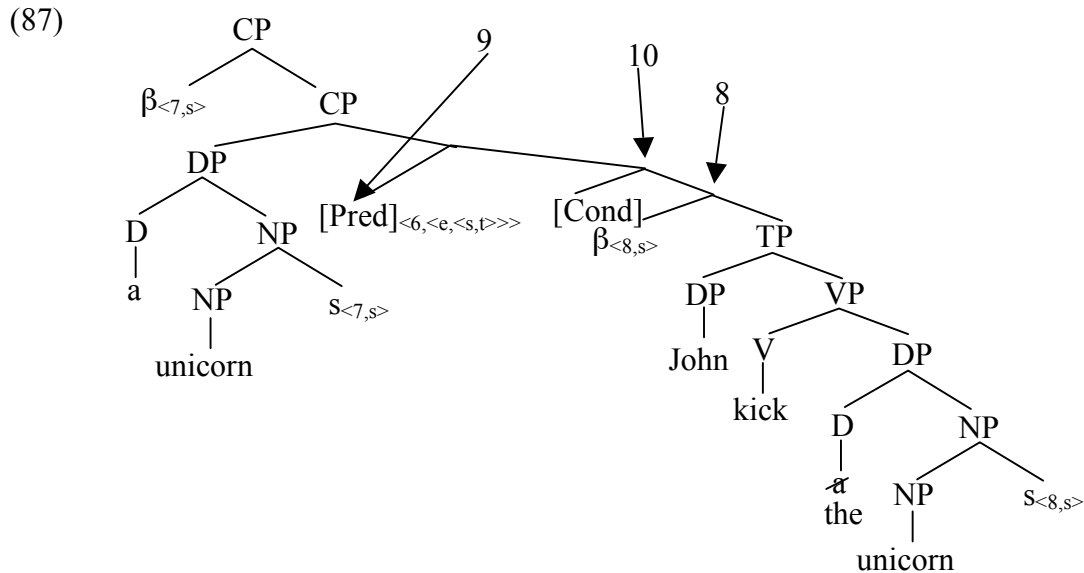
In (86) we take advantage of the quantification over situations that [Cond] provides. [Cond] takes, as its first argument (the antecedent), a proposition in which one of the copies of *a unicorn* has its situation variable bound. [Cond]’s second argument (the consequent), moreover, has a situation bound by a different β operator but in a fashion parallel to the antecedent. This configuration allows the two copies of *a unicorn* to be interpreted relative to parallel situations, without being bound directly to each other as in more typical quantifier movement.

Note that the movement in (61) is optional, and another option is to keep all the DPs in situ and treat the sentence as a sentence-external IC. The analysis of the latter type of construction, where there is no movement of a DP, is discussed in the next section.

3.3.3. Aside: Sentence-Internal ICs Without Sideward Movement

I think that the syntactic operation outlined in section 3.3.3 is the most natural way to capture the prominent reading of the sentence-internal IC. However, it is possible to de-

rive the same semantics via movement of the DP to a c-commanding position, if we change the semantics of the [Pred] operator.⁹ It will still be necessary to assume that the unmoved copy of the DP need not be coindexed with the higher copy. The resulting structure I have in mind is something like (87).



Here, the [Cond] operator will have to be typed up. This is because the semantics from before (88) is not of the correct type to combine with its sisters, which are nodes 8 and 9 in (87). Node 8 is a proposition, so [Cond] as it stands could combine with that, but the result, node 10, would be of type $\langle \langle s, t \rangle, t \rangle$, which is not the right type to combine with node 9, which consists simply of [Pred], which is type $\langle e, \langle s, t \rangle \rangle$.

⁹ A similar analysis, applied to the case of quantificational adverbs in generic sentences, can be found in Hinterwimmer 2005.

$$(88) \text{ [[Cond]]} = \lambda p_{\langle s,t \rangle} \lambda q_{\langle s,t \rangle} \lambda w \forall s [\text{ClosestSituations}(\min(p))(w)(s) \rightarrow \exists s' [s \leq s' \wedge q(s')]]$$

So we need a new semantics for [Cond], of the rather formidable type

$\langle \langle s,t \rangle, \langle \langle e, \langle s,t \rangle \rangle, \langle \langle \langle e, \langle s,t \rangle \rangle, \langle s,t \rangle \rangle, \langle s,t \rangle \rangle \rangle$, so that it can combine first with node 8, then with node 9 ([Pred]), and finally with the moved DP *a unicorn* to form a proposition. The new semantics would be (89).

$$(89) \text{ [[Cond]] (alternate)} = \lambda p_{\langle s,t \rangle} \lambda P_{\langle e, \langle s,t \rangle \rangle} \lambda Q_{\langle \langle e, \langle s,t \rangle \rangle, \langle s,t \rangle \rangle} \lambda w \forall s [\text{ClosestSituations}(\min(Q(P)))(w)(s) \rightarrow \exists s' [s \leq s' \wedge p(s')]]$$

Definition (89) is semantically like the old definition (88), except that instead of being a general conditional operator, (89) contains within it the specific instructions of how to semantically combine the generalized quantifier with the [Pred] element, represented by P and Q in the formula. This works out semantically, but in the theory defended in this thesis, [Pred] and the generalized quantifier are combined by general syntactic operations and interpreted by functional application. In other words, the theory defended in the thesis better maintains the traditional labor between syntax and semantics, whereas the alternative explored in this appendix requires that relationship to be substantially disrupted.

Notice also that this analysis shares with the one in 3.3.3 the property that the lower copy of *a unicorn* should not be indexed. Also, the higher copy of *a unicorn* is not appended with a μ operator. This is because such an indexing would be uninterpretable. Even though the moved copy moves to a c-commanding position, it gets “swallowed up” as an argument of [Pred] and hence it can’t semantically bind the unmoved copy. Rather,

it is the situation variable present in the unmoved copy that gets bound, by the β in the structure. Thus, even with traditional movement, we are forced to a non-standard interpretation of the resulting structure, with a lack of semantic binding of the lower copy by the upper copy.

The non-sideward movement analysis has the advantage that it preserves traditional notions of the Extension Condition (see Chomsky 1993) on movement (though see Nunes 1998, 2004 for arguments for a weaker notion of the Extension Condition which is not violated by sideward movement, and Richards 1997 for a related weakening of the Extension Condition). In addition, the type of sideward movement advocated here violates conditions on sideward movement advocated by Nunes, who argues that sideward movement of copies of XP from position to A to position B, for example, should only be allowed if there is a further movement of a copy of XP to a position C, such that C c-commands both B and A. However, see Boeckx 2003 for an analysis of donkey sentences, quite related to the analysis of sentence-internal ICs here, which involves sideward movement without such subsequent movement to a c-commanding position.¹⁰

I disfavor the non-sideward movement analysis for a few reasons. First, there is the typed-up nature of [Pred]. This seems unnecessarily complicated, and inferior to an analysis where [Pred] is simply a property. Relatedly, it seems odd that [Pred] should be indexed with a different type from that which it is interpreted as.

¹⁰ Later in that paper, Boeckx (2003) speculates about a further movement which would bring his analysis in line with Nunes's constraint on sideward movement, but such a move would destroy the semantic adequacy of the analysis, and is not motivated for any reason internal to the donkey-sentence data.

Secondly, and more importantly, the change to a non-sideward movement analysis does not result in a return to traditional movement in general, as I mentioned above. The movement involved is still exceptional because it does not result in a semantic binding relationship. In addition, the required non-sideward version would violate a constraint I motivate below in section 5.2, which essentially requires that all upward movement (movement to c-commanding positions) *must* result in a semantic binding relationship between the higher copy and the lower copy. Such a constraint explains some otherwise puzzling facts that are discussed in section 5.2.

The analysis defended here can make a sensible generalization, namely that while all upward movement must result in a semantic binding relationship, sideward movement need not. This makes sense, of course, since it is unclear how, with sideward movement, we would create a semantic binding relationship between the two copies. The assumption that sideward movement is the *only* type of movement which can fail to create a binding relationship leads to an explanation of various facts, as well as an elegant analysis of the basic facts of sentence-internal ICs.

3.4. Compositional Semantics of Sentence-External ICs

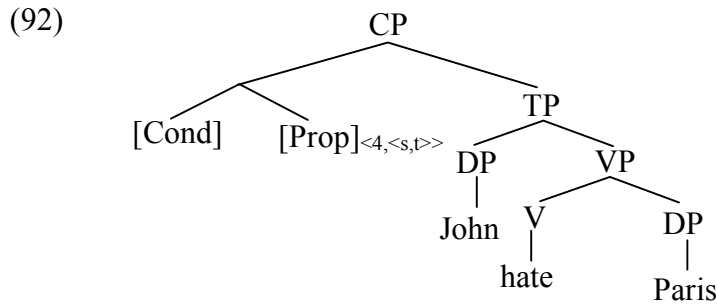
Now we must return to the case of Sentence-External ICs, with which we started in section 2.2. The analysis of this type of sentence covers not only ICs with no indefinite noun phrases whatsoever, but all ICs for which the understood antecedent, or the antecedent in the full conditional paraphrase, does not contain any of the indefinites in the sentence it-

self. For example, I have in mind a reading of (90a) which is best paraphrased as in (90b), and a reading of (91a) that is best paraphrased as in (91b). In the latter case, the use of the creation verb *write* biases us against a reading of the type analyzed in section 3.3, where the indefinite quantifier would be outside the scope of the verb, and towards a reading where the indefinite is inside the scope and the antecedent has nothing to do with the hypothetical existence of a book. (If the book already existed, John presumably couldn't write it.)

- (90)a. John would hate Paris.
- b. If John went to Paris, he would hate it.

- (91)a. John would write a book.
- b. If John had a near-death experience, he would write a book.

The statement in (8) gives a vague principle for deciding what the understood antecedent of a sentence-external IC will be. I will not make that guideline more precise here, but rather simply provide a syntactic frame for where this antecedent can go. I propose that the LF structure of an IC without an indefinite is minimally different from the structure in (61), the main two differences being that a) the indefinite, if there is any, does not move, and b) instead of supplying a silent [Pred] at the left periphery, we supply a silent [Prop], i.e., a proposition whose content must be filled by the context. ([Pred] and [Prop] are viewed as being rather similar; both are silent pronouns standing for higher-type functions whose value is determined by the assignment. The difference, however, is their exact type: [Pred] is of type $\langle e, \langle s, t \rangle \rangle$, while [Prop] is of type $\langle s, t \rangle$.)



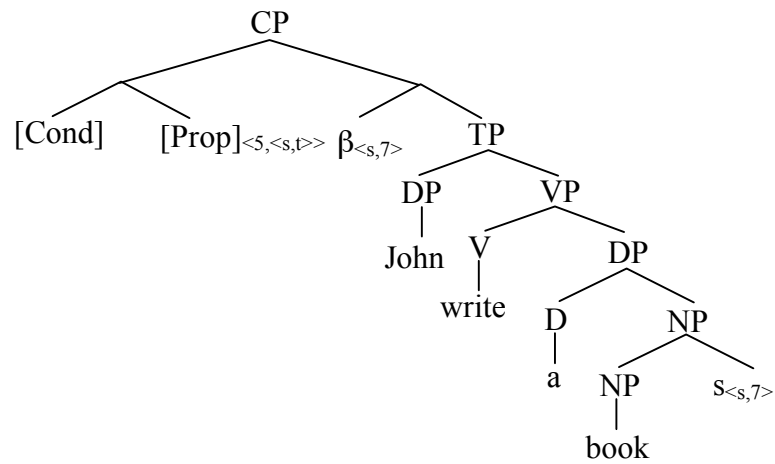
The structure for (90) is (92). For simplicity, I will assume that *Paris* is a rigid designator and hence does not need a situation pronoun. (92) is interpreted as saying that if the contextually salient proposition were true, John would hate Paris. To exemplify an interpretation formally, let us suppose that the assignment assigns the proposition that John visits Paris to the index combination $\langle 4, \langle s, t \rangle \rangle$. In that case, we have:

$$\begin{aligned}
 (93) \llbracket (92) \rrbracket^g &= \llbracket \text{Cond} \rrbracket^g(\llbracket [\text{Prop}]_{\langle 4, \langle s, t \rangle \rangle} \rrbracket^g)(\llbracket \text{John hate Paris} \rrbracket^g) = \\
 &\llbracket \text{Cond} \rrbracket^g(g(4, \langle s, t \rangle))(\llbracket \text{John hate Paris} \rrbracket^g) = \\
 &\llbracket \text{Cond} \rrbracket^g(\lambda w \text{ John visits Paris in } w)(\lambda w \text{ John hates Paris in } w) = \\
 &\lambda w \forall s [\text{ClosestSituations}(\min(\lambda w \text{ John visits Paris in } w))(w)(s) \rightarrow \exists s' [s \leq s' \wedge \\
 &\text{John hates Paris in } s']] = \text{(informally)} \\
 &\text{The set of possible worlds } w \text{ such that every situation } s \text{ which is a closest situation} \\
 &\text{to } w \text{ and such that } s \text{ is a minimal situation of John visiting Paris is part of a situation} \\
 &s' \text{ such that John hates Paris in } s'.
 \end{aligned}$$

The same type of structure and interpretation will happen in a sentence-external IC even if there is an indefinite in the sentence, as in (91), repeated here as (94). Since there is an NP, there will be a situation variable associated with *book*, which will be bound by a β operator.

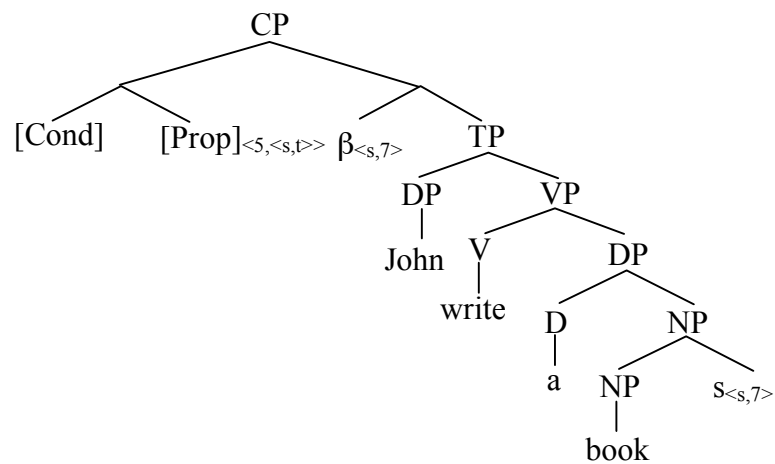
(94) John would write a book.

(95)



In this case, the indefinite DP does not move to the left periphery. It presumably does move for type reasons, of course. But for simplicity I will not include this movement in the LF structures here.

(96)



An informal paraphrase of the interpretation of (95), assuming that [Prop] in this case ends up being interpreted as the proposition that John has a near-death experience (or, that $g(5, \langle s, t \rangle) =$ the proposition that John has a near-death experience) is:

- (97) The set of possible worlds w such that every situation s which is a closest situation to w and such that s is a minimal situation of John having a near-death experience is part of a situation s' such that John writes, in s' , a book in s' .

3.5. Conclusion

This chapter has introduced the analysis I endorse for implicit conditionals, with a special focus on sentence-internal implicit conditionals. Arguments from chapter 2 show that ICs in general are interpreted as having some sort of implicit antecedent, as well as the consequent which is given mostly by the overt material. Further, the arguments suggest that a subclass of ICs, called the sentence-internal ICs, derive part of their antecedent from material within the sentence, and not entirely from the context. (Further arguments are given for this type of analysis, and against alternatives, in chapter 6.)

Given these results, this chapter has developed an implementation of the general type of analysis argued for in chapter 2. This involved setting up the semantic ontology required, as well as exhibiting a syntactic analysis that can provide the necessary ingredients for the correct semantic analysis. Some of the particular choices I made do not affect the results crucially, such as the decision to use overt variables. But other choices are crucial, such as the analysis of counterfactual conditionals in terms of closest situations to the world of evaluation.

The syntactic mechanism for interpreting sentence-internal ICs, that of copying side-ward movement, plus trace conversion of the unmoved copy, is also crucial to the analysis and is supported by the data. The lower copy needs to be interpreted as a definite so that its referent will be anchored to the situations introduced by the antecedent. The side-ward character of the movement was defended in section 3.3.3, where I show that although a mechanism can be devised where the movement is to a c-commanding position, such a mechanism would suggest a direct semantic binding between the moved copy and the unmoved copy, whereas what we want is an indirect binding relationship.

So the conclusion is that the system introduced in this chapter is on the right track. It generates the readings that we in fact find for the sentences, and it does so with a minimum of extra assumptions, although the data require some new mechanisms. In the coming chapters, we will see other types of ICs which will be handled by the same general mechanism, though in some cases extensions will be necessary.

Chapter 4

Other Quantifiers

4.1. Introduction

Up until now, among sentence-internal ICs, we have limited our attention to those where an indefinite noun phrase forms part of the antecedent. This will continue to be the main type of example for illustration of other points in chapters 5 and 6, since the examples are simple, relatively easy to make intuitive judgments on, and usually illustrate the relevant points well. However, in this chapter we investigate the possibilities that arise when the IC construction is combined with other types of quantified DPs. The result is that most DPs can enter into sentence-internal ICs with the results that the analysis predicts, although sometimes this results in some strange readings. In a few places we end up having to modify the assumed structure to generate the readings we do in fact get, but these modifications are natural extensions of the theory.

Section 4.2 discusses the consequences of including a definite determiner with an IC. Section 4.3 discusses plural determiners, such as *most* and *all*. Then section 4.4 switches to the singular but universal quantifiers *each* and *every*. Finally, section 4.5 investigates the complex matter of the negative polarity determiner *any* and the positive polarity determiner *some*, and related constructions.

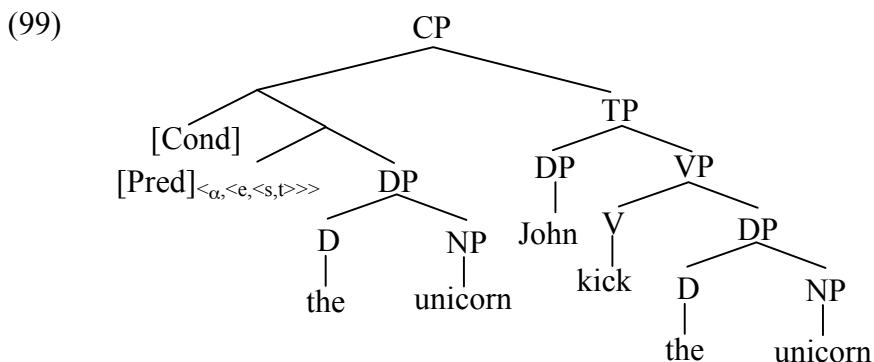
4.2. The Definite Determiner

First we consider the case of a noun phrase headed by the definite determiner, and see what happens when we try to raise such a noun phrase to the left periphery to combine with [Pred], in a sentence such as.

(98) John would kick the unicorn.

The judgment of (98) is that it can only be said in a discourse if there has been a unicorn mentioned or implied in that discourse. The unicorn could either be presupposed to exist in the actual world, or its existence may be hypothetical. But the discourse cannot fail to provide any unique salient unicorn. Let us see if the current analysis predicts this judgment.

By my earlier assumptions, a definite noun phrase denotes a plain individual, type e . By the raising analysis, we will end up in the left side of the tree with the Predicate combining with this definite determiner to produce a proposition.



(100) $\llbracket \llbracket \text{Pred} \rrbracket_{\langle e, st \rangle} \llbracket \text{DP the unicorn} \rrbracket_e \rrbracket = \lambda s \llbracket \text{Pred} \rrbracket(\llbracket \text{the unicorn} \rrbracket)(s)$

We must remember, however, that the definite determiner imposes presuppositions on the sentence. Since by hypothesis we are raising a copy of the definite noun phrase to the antecedent of the clause, these presuppositions will project to the whole clause, just as with definites in the antecedents of full conditionals (as discussed, e.g., by Heim 1983, Karttunen 1973, 1974). The classic example of this is the “king of France” example, where (101) presupposes that there is a king of France, because the definite is in the antecedent.

(101) If the king of France were bald, France would be the laughing stock of Europe.

(102), similarly, presupposes the existence and uniqueness of a contextually salient unicorn.

(102) If John saw the unicorn, he would kick it.

Therefore, the prediction of the current analysis is that, if we raise a definite DP in an IC, the IC will have the presuppositions imposed by the DP. The effect this will have on meaning of the sentence will depend on which type of predicate is chosen for Pred. For example, if [Pred] is again chosen to be the property of existence, and if we assume, fairly standardly, that the presupposition imposed by the definite article is the existence

and uniqueness of an exponent of the property denoted by its sister, then for (98) we have a situation where [Pred] is the same as the presuppositions of the DP. We will then end up with a paraphrase as in (103a), with a presupposition as in (103b).

- (103) a. If the unicorn existed, John would kick it.
b. Presupposition: a unique unicorn exists.

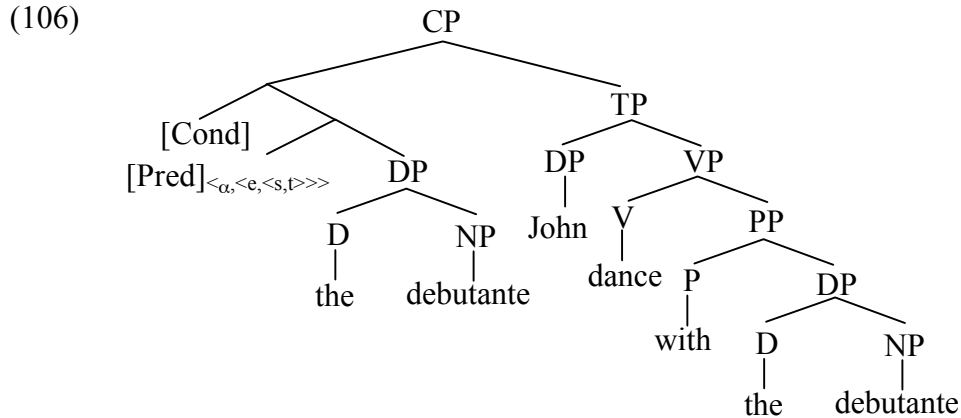
We might therefore expect a presupposition failure given the presuppositions of a counterfactual. That is, a Counterfactual conditional presupposes that its antecedent is not known to be true. But any time we could use (98) on the DP-raised reading would be a situation where the understood antecedent would already be presupposed. We might therefore expect speakers to avoid understanding the sentence on the raised reading, with this particular assignment for Pred.

However, if another value for [Pred] is chosen, there may not be any conflict. Consider an example like (104).

- (104) John would dance with the debutante.

I claimed in section 2.3 that similar examples with indefinites most likely involve an assignment for [Pred] that does not involve the property of existence, but rather something like the property of being encountered by John. Assuming the same value in (104), we will have an antecedent like (105), from a tree structure as in (106).

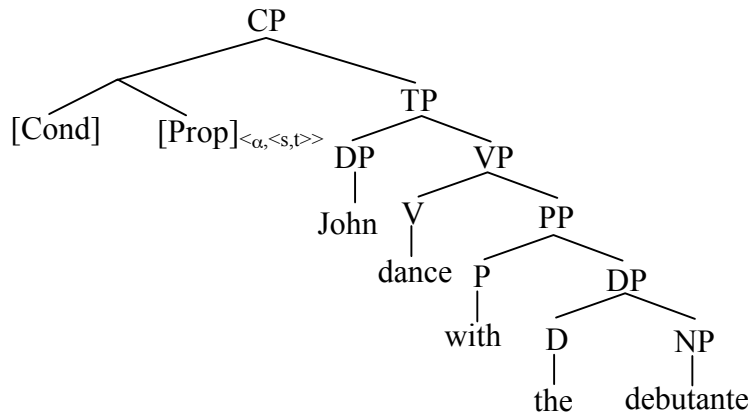
- (105) a. $[\lambda x \lambda s x \text{ is encountered by John}]([\text{the debutante}]) = \lambda s \text{ the debutante is encountered by John in } s$
 b. Presupposition: a unique debutante exists.



On this analysis, (104) presupposes a unique debutante in the discourse and asserts that if John were to encounter her, he would dance with her. There is nothing anti-counterfactual about this, and, as predicted, I think (104) does in fact have this reading. Thus, the prediction of the analysis is met.

There is another possible analysis of ICs with definites that needs to be mentioned: what are the readings predicted for definite DPs if they *don't* move? For some examples at least, the interpretation will be basically the same as if it did move. Consider (107). Now we leave the definite DP in situ, and simply insert the context-dependent Prop as the antecedent.

(107)



Will the presuppositions of the DP still project to the entire sentence? Yes, because although the definite is now in the consequent of a conditional, which can sometimes be a plug, in Karttunen's sense, for presuppositions, this is only the case if the antecedent satisfies those presuppositions. The classic example, again, is a "king of France" example, where, given the right antecedent as in (108a), the presupposition of the definite, if it is in the antecedent, can be plugged, but if such an antecedent is not chosen, as in (108b), then the presupposition still projects to the entire sentence.

- (108) a. If France had a king, the king of France would be bald.
b. If baldness were more common, the king of France would be bald.

In the case in (107), the antecedent is the proposition denoted by [Prop]. So in order for the presuppositions of the definite DP to be plugged in the sentence, and hence not project, [Prop] must be assigned the value of a proposition which satisfies the presuppositions of the definite. (In this case, that would have to be a proposition which entails that a unique debutante exists.)

Now, remember, the value of [Prop] is determined by the contextually salient assignment function. So the question of whether [Prop] can be assigned as its value a given proposition *p* is linked to the question of whether *p* is in the range of the assignment function. The answer, I propose, is that a given proposition *p* will be in the range of the assignment function if and only if *p* is, in some sense, salient in the discourse. This is the natural extension of the assumptions about which *individuals* will be in the range of an assignment function. For example, in Heim (1982) it is made clear that an individual becomes part of the range of a given assignment function exactly when that individual becomes salient in the discourse.

Therefore, a definite DP will be felicitous in an IC only if a proposition which entails the presuppositions of the definite is salient in the discourse. This is true on either analysis of the IC: sentence-internal or sentence-external, because in the former case, the presuppositions of the definite project outside the clause, and in the latter case, the [Prop] element which can potentially plug the presuppositions of the definite must be supplied by the discourse context. Next, we have to ask what it means for a proposition to be “salient in the discourse”. Does it mean the proposition has to be assumed to be true?

The place to look for the answer here is data from modal subordination, as described by Roberts (1986, 1989) and others. The data suggest that truth of a proposition is a sufficient, but not a necessary condition for it to plug presuppositions of the antecedent. The analysis here largely parallels Roberts’s DRT analysis. I propose that the requirement is simply that either the truth of the presupposition must be entailed by the context, or the possibility, including real, hypothetical, or counterfactually possibilities, has to have been

considered relatively recently in the discourse. (However, in the case of a true counterfactual possibility, where the participants don't consider the proposition possible, the perfect conditional seems to be required, as in (111b).) Consider sentence (104) in the following three discourse contexts.

- (109)a.A: A debutante is having a party. If John went to that party, what do you think he would do?
b. B: John would dance with the debutante.

- (110) a.A: There might be a debutante at the party that John is going to. I wonder what would happen if so.
b.B: John would dance with the debutante.

- (111)a. There will be no debutante at the party.
b. (That's a shame.) John would have danced with the debutante.¹¹

The (a)-sentences of (109-111) all represent discourse contexts which are sufficient to license the definite in (104) (and the b-sentences of (109-111)). (109a) licenses it by establishing that a debutante exists, in a relevant context, in the actual world. (110a), instead, establishes the *possibility* that a debutante might exist, while (111a) establishes that, in

¹¹ There is some evidence that [Prop] may be more syntactically complex than I have assumed here. Contrast (111) with

- (i) a. There will be no debutante at the party.
b. (That's a shame.) #John would have danced with them.
(ii) a. There will be no debutantes at the party.
b. (That's a shame!) John would have danced with them.
c. (That's a shame!) #John would have danced with her.

(ia) and (iia) seem to have the same truth conditions. Therefore their different effects on the felicity of the responses seems to have to do with a formal, syntactic number agreement, which may indicate that what I am calling [Prop] is not simply a pronoun over proposition but has some internal syntactic structure. I leave this issue for further research.

the actual world, there is no relevant debutante. But all three (a)-sentences establish the *salience*, in some sense, of the proposition that a debutante might exist.

Now, there are a number of ways in which we might analyze the effect that the (a)-sentences of (109-111) have on the licensing of the presuppositions of the DP *the debutante*. But one method which presents itself at this point is as follows.

In the case of (109), (109a) directly introduces a relevant debutante into the universe of discourse, thus licensing the presuppositions directly. Therefore, in this case [Prop] will not be needed in (109b) to license the presuppositions of the DP; and indeed, [Prop] in (109b) will most likely be something like “John goes to the party”, taking its value directly from the question in (109a). The interpretation, as well as the felicity conditions, of the sentence in this context is predicted to be the same as if the DP moves, as in the analysis above in (106).

(110a), on the other hand, does not claim that a debutante exists in the actual world. So arguably it doesn't introduce a debutante into the universe of discourse. Instead, it makes salient a proposition of the form “There is a debutante at the party John is going to”, but without claiming its truth. In (110b), then, [Prop] can take on this very value, and can therefore license the presuppositions of the definite DP.

Essentially the same thing happens in (111), only now the context explicitly denies the truth of the presupposition of the definite. This triggers the requirement for the counterfactual mood in (111b). Perhaps this can be tied to the fact that the situations quantified over must all be disjoint from the actual world. I will not attempt to make the determina-

tion of the mood explicit here, however; see Ippolito (2002, 2003) for extensive discussion of this issue.

4.3. Plural Determiners

Plural determiners generally behave alike, and most behave similarly to indefinites, under ICs. Let us look at some examples.

- (112) a. John would kick 5 unicorns.
b. John would kick most unicorns.
c. John would kick few unicorns.
d. John would kick no unicorns.

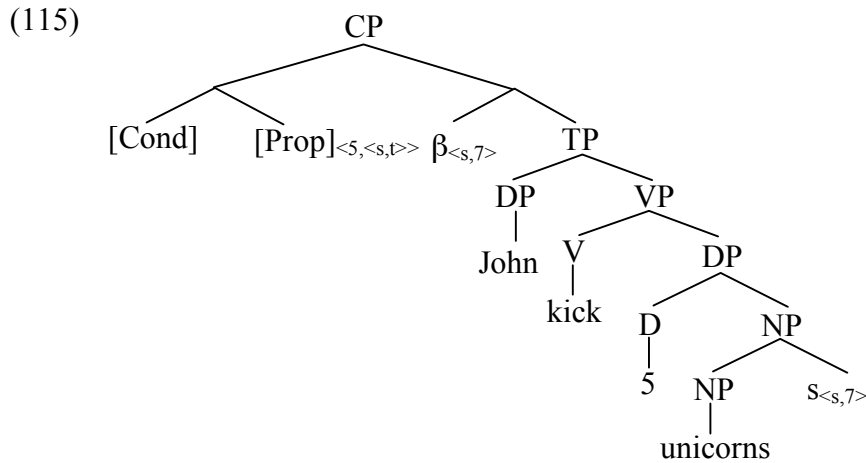
- (113) a. John would dance with 5 debutantes.
b. John would dance with most debutantes.
c. John would dance with few debutantes.
d. John would dance with no debutantes.

First, plural determiners allow a sentence-external reading. Let us take (112a) as an example. We assume a circumstance in which unicorns are assumed to exist, but only in certain areas, and in which it has been mentioned that John might venture into the area where unicorns live. In that case, a reasonable paraphrase of (112a) might be (114).

- (114) If he went into the area where unicorns live, John would kick 5 unicorns.

The other examples have similar readings available. So (112b) can mean “If he went into the area where unicorns live, John would kick most unicorns (in that area).” And so forth.

To derive this type of reading, we will employ a structure as in (115), where the DP does not move to the left periphery (though again, it presumably moves locally for type reasons) and where the value of [Prop] is determined by the context.

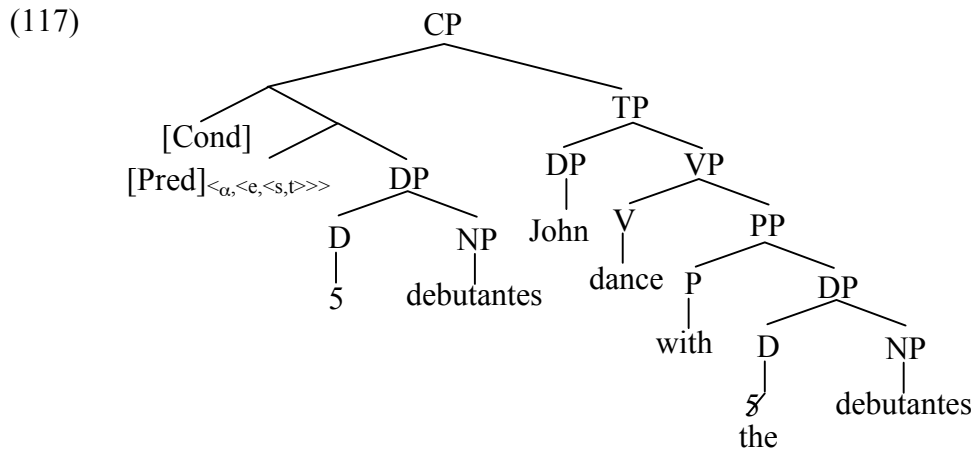


The expected interpretation of (115) is (116), which does in fact correspond to the paraphrase in (114).

(116) The set of possible worlds w such that every situation s which is a closest situation to w and such that s is a minimal situation of John going to the place where unicorns live is part of a situation s' such that John kicks, in s' , 5 unicorns in s' .

In the case of the upward-entailing determiners, we also can get a sentence-internal reading, the reading predicted if we raise the DP to the left periphery just like we raised indefinites in section 3.3. I will refer to this as the “narrow-scope” sentence-internal read-

ing, to distinguish it from a different reading that I will introduce below. For example, in (113a), what we expect in the left periphery is to combine *5 debutantes* with a [Pred] element, as follows:



The interpretation of the understood antecedent will then be:

$$\begin{aligned}
 (118) \quad & [[[\text{Pred}] [\text{DP } 5 \text{ debutantes}]]] = \\
 & [\lambda P_{\langle e, st \rangle} \lambda s \mid \{x: x \text{ is a debutante in } s\} \cap \{x: P(x)(s)\} \mid \geq 5] ([\lambda x \lambda s \mid x \text{ is in proximity} \\
 & \text{to John}]) \\
 & = \lambda s \mid \{x: x \text{ is a debutante in } s\} \cap \{x: x \text{ is in proximity to John}\} \mid \geq 5
 \end{aligned}$$

This proposition will serve as the antecedent to the conditional. With trace conversion in the base position, the consequent will be understood as “John would dance with the debutantes”, and the whole sentence will be understood roughly as:

(119) Paraphrase of (113a): If John were in proximity to 5 debutantes, he would dance with them.

For the other determiners, this would work in parallel:

(120) If John were in proximity to most debutantes, he would dance with them. ok =
(113b)

On the other hand, the downward entailing determiners do not allow narrow-scope sentence-internal readings at all. This seems to be because the resulting truth conditions are pragmatically incoherent, rather than because there is anything in the syntax or semantics which blocks the readings. The expected paraphrases of (113c-d) would be as in (121).

(121) a. #If few debutantes were in proximity to John, he would dance with them.
b. #If no debutantes were in proximity to John, he would dance with them.

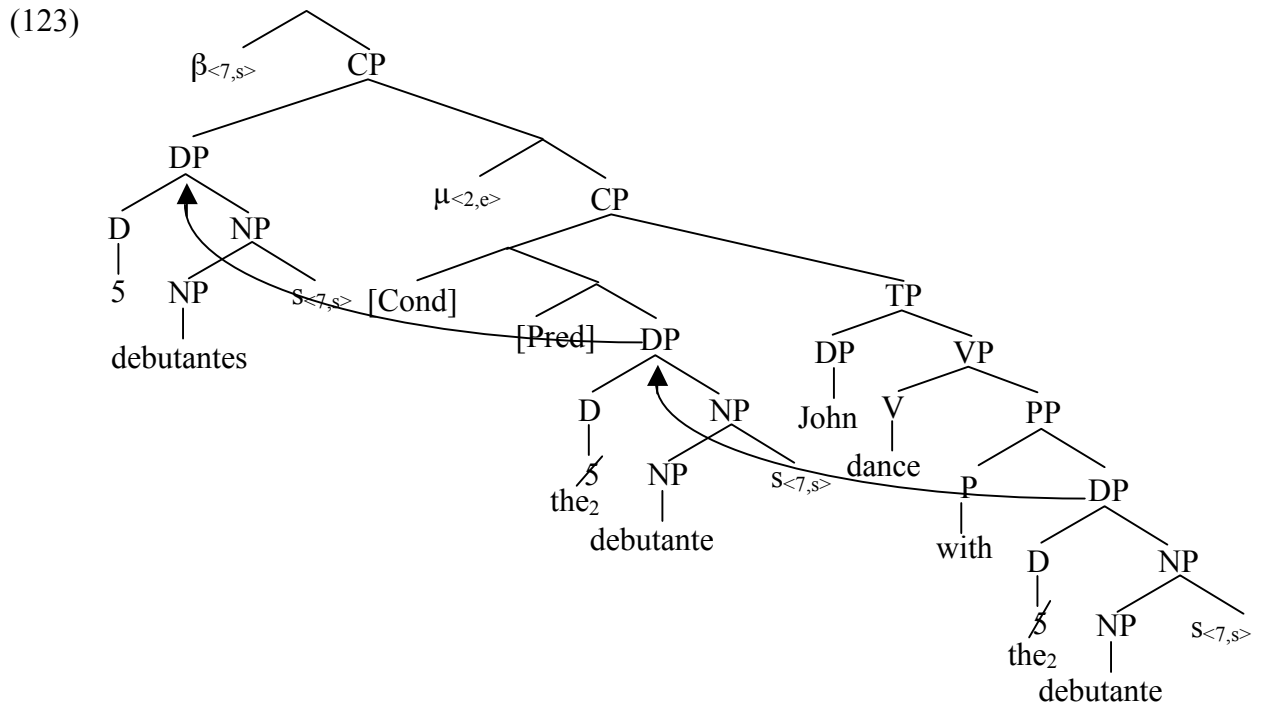
Such sentences are incoherent because downward entailing DPs in the antecedents do not guarantee the existence of any individual that the pronoun in the consequent (donkey pronouns) can refer to.

The type of reading which *is* available for all of the examples in (112-113), including those with downward-entailing determiners, is one where the DP scopes out of the antecedent. I will refer to this as a “wide-scope” sentence-internal reading. Paraphrases of (113) on these readings follow:

(122) a. 5 debutantes are such that, if John encountered them, he would dance with them.
b. Most debutantes are such that, if John encountered them, he would dance with them.
c. Every debutante is such that, if John encountered her, he would dance with her.

- d. Few debutantes are such that, if John encountered them, he would dance with them.
- e. No debutantes are such that, if John encountered them, he would dance with them.

This type of reading (also the only movement-based reading available to singular *some*, to which we return in section 4.5.2) can be derived by moving the DP first sideward as with the indefinites, and then upward out of the antecedent leaving a trace. This is why I name it the wide-scope sentence-internal reading; the DP first moves into the conditional left periphery, as in basic sentence-internal conditionals; then it moves higher to take wide scope over the entire sentence, including both of its lower copies. I give as an example the case of 5.



The type of movement here is fairly uncontroversial quantifier raising. The only difference is that this movement creates a binding relation between the top copy and each of the two lower copies. This tree will be interpreted as in (124), simplifying somewhat, abstracting away from some of the situation binding and from the plural semantics of the quantifier.

- (124) a. $\llbracket \llbracket 123 \rrbracket \rrbracket = \llbracket \llbracket 5 \text{ debutantes} \rrbracket \llbracket \lambda x \llbracket \llbracket \text{Cond} \rrbracket \rrbracket \llbracket (\lambda s \text{ } x \text{ is encountered by John in } s) (\lambda s' \text{ } \text{John dances with } x \text{ in } s') \rrbracket \rrbracket =$
 b. $\lambda s \{x: x \text{ is a debutante}\} \cap \{x: \llbracket \llbracket \text{Cond} \rrbracket \rrbracket \llbracket (\lambda s \text{ } x \text{ is encountered by John in } s) (\lambda s' \text{ } \text{John dances with } x \text{ in } s') \rrbracket \rrbracket \geq 5$

The top quantifier binds both of the other (trace-converted) copies of the DP *5 debutantes*. The resulting structure is interpreted as we want, as the proposition that 5 debutantes are such that, if they were to be encountered by John, John would dance with them.

4.4 *Every, Each*

The determiners *every* and *each* are morphologically singular, but in ICs they behave largely the same as the upward-entailing plural determiners. They are most natural in the wide-scope sentence-internal reading. So (125a) is best as paraphrased in (125b).

- (125) a. John would dance with every/each debutante.
 b. Every/Each debutante is such that, if John encountered her, he would dance with her.

As for the narrow-scope sentence-internal reading, I find a contrast between *each* and *every*. That is, I find (126b) better as a paraphrase for (126a) than I find (127b) as a paraphrase for (127a), although neither works as well with this type of reading as the plural determiners or the singular indefinites do.

- (126) a. John would dance with every debutante.
b. (?)=If John encountered every debutante, he would dance with (all of) them.

- (127) a. John would dance with each debutante.
b. # =If John encountered each debutante, he would dance with (all of) them.

This may be related to a general preference for *each* to take wider scope than *every*, as discussed, for example, in Beghelli and Stowell 1997. I leave it to further research to determine exactly what the interaction is between this preference and the IC construction.

4.5. Singular *any*, *some*

The two main other truly “singular” determiners in English, besides the indefinite *a*, are *any* and *some*. They behave rather differently. We will treat them one at a time.

4.5.1. *Any*

The status of *any* in a sentence-internal IC is potentially controversial. *Any* in a sentence like (128) is traditionally assumed to be “free choice” *any*, which, again traditionally, is interpreted as having roughly the semantics of a universal quantifier, or possibly a generic quantifier. However, it also lends itself to an interpretation as an indefinite quanti-

fier, with the exception that the domain-widening properties of *any*, first noted by Kadmon and Landman (1993), assert their influence in (128), which comes to emphasize that the class of unicorns that John would kick if they existed is all-inclusive of conceivable unicorns. (See also von Stechow 1999, Chierchia 2004, 2006.)

(128) John would kick any unicorn.

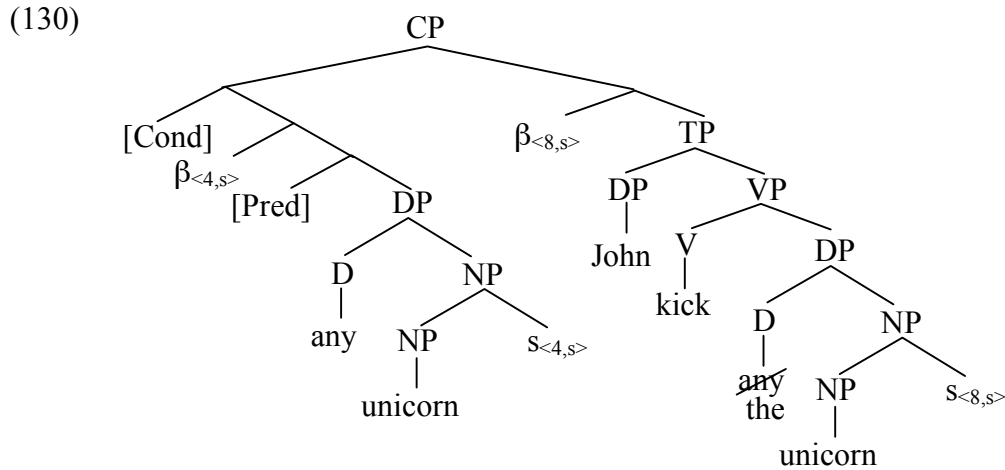
This is unsurprising, since apart from this domain-widening property, *any* is claimed by Kadmon and Landman to have the same semantics as the indefinite article, an assumption which predicts the right results here.

Kadmon and Landman's aim is to unify the treatment of two uses of *any* which are often assumed to be distinct, namely Polarity Sensitive (PS) *any* and Free Choice (FC) *any*. (See Dayal 1998, however, for arguments against such a unification.)

There is a potential here, however, to at least partially unify PS *any* and FC *any* in a different direction. For it is well known that PS *any* is licensed within the antecedent of a conditional (129a), along with other negative polarity items (NPIs) (129b). (See von Stechow 1999 for arguments that the environment of the antecedent of a conditional is downward entailing in a certain sense, even if not in the classical sense.)

- (129) a. If you see anyone at the store, don't go in.
b. If you lift a finger to help him, I'll never speak to you again.

Now, although the use of *any* in (128) is traditionally viewed as being an instance of free choice *any*, the analysis of the sentence proposed here, on its sentence-internal reading, suggests a different approach. We end up with a structure as in (130).



In this structure, we see that the moved copy of *any unicorn* is in the restrictive scope of a conditional operator (an antecedent), a known licenser of PS *any* and other NPIs. The unmoved copy of *any unicorn*, meanwhile, is in the consequent clause, which is known not to be a licenser of NPIs. However, the lower copy has undergone trace conversion, and is interpreted as a definite noun phrase. If NPI licensing takes place after trace conversion, which makes sense if it is a semantic property, then we expect (130), on the whole, to not violate NPI licensing.

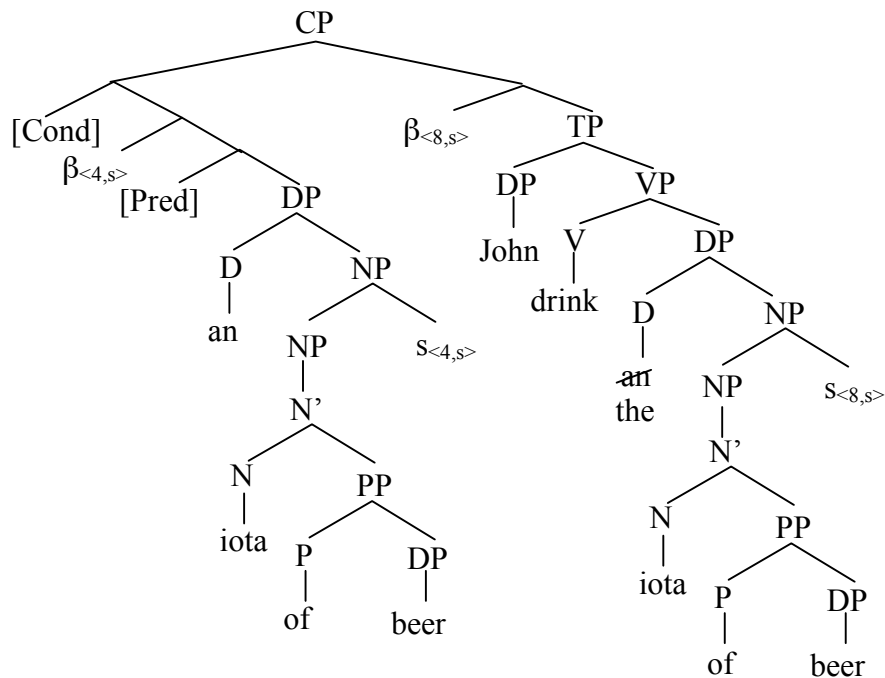
It might be objected, at this point, that other noun phrase NPIs are not licensed in sentence-internal ICs:

(131) *John would drink an iota of beer.

(With the meaning, “If an iota of beer were available to John, he would drink it.”)

This failure of licensing, however, follows from our assumptions on trace conversion. For in the NPI phrase *an iota of*, the polarity-sensitive properties presumably come from the head noun, and not from the determiner, which is a plain *an*. This contrasts with the case of *any*, where the NPI-properties come from the determiner. Thus for (131) we will have a structure like (132), where we perform trace-conversion, but it does not help license the phrase *an iota of beer*, because the noun *iota* is still intact; trace conversion only affects determiners.

(132)



To put it another way, the ungrammatical status of (131), and hence the illegitimacy of (132), is presumably related to the ungrammatical status of (133).

(133) *If there were an iota of beer, John would drink the iota of beer.

Similar affects are obtained with any other case where an NPI is embedded within a DP, rather than being itself a determiner, such as ().

(134) *John would marry a woman who has ever been to Paris.

This result depends on the assumption that trace conversion can only operate on the determiner which is the head of the DP which has moved. See also chapter 5, where this assumption predicts the correct results for a quite different set of data.

So far we have seen that the idea that *any* is simply an indefinite article with negative polarity sensitivity, including in the case of sentence-internal ICs, is promising given the data and the predictions of the analysis of sentence-internal ICs defended in this thesis. The idea is compatible with, but does not hinge on, Kadmon and Landman's analysis of *any* as a domain-widening determiner.

A more ambitious claim would be to pursue the hypothesis that *all* cases in which it has previously been claimed that an example of *any* is free choice *any* can in fact be analyzed as NPI *any* in a sentence-internal IC. I will not be able to completely defend this latter claim here, but will suggest a few facts which support this possibility.

Indeed, most of the cases which contain traditional free choice *any* are generic statements of some sort, with or without overt modal operators.

- (135) a. Any owl hunts mice.
b. John could catch any owl.
c. John can catch any owl.

The idea would be to try to assimilate the cases in (135) to the structure of an IC. This is the easiest in (135b), where *could* is arguably simply the conditional version of *can*, so that the sentence is essentially synonymous with *John would be able to catch any owl*.

(135a) and (135c), on the other hand, clearly can't be analyzed as *counterfactual* conditionals. But they may be analyzed as habitual sentences, which in turn have largely the structure of *indicative* conditionals. (135a), for example, would have to be understood as a type of conditional such as that paraphrased in (136).

- (136) If any owl is in a typical hunting situation, it hunts mice.

The claim has to be that (135a) requires some sort of contextually supplied property, some assignment for [Pred], in order to be understood.

The account does not so far explain the observed stress patterns in traditional free choice *any*, in which the word *any* itself is obligatorily stressed when understood as free choice (137a), but not when it is an NPI (137b).

- (137) a. ANY owl hunts mice.
b. John didn't see any owl.

The story also does not address Dayal's (1998) arguments that free choice *any* must, after all, be interpreted as a universal quantifier, and not as an indefinite, contra Kadmon and Landman, for whom *any* is *always* indefinite. Dayal's argument is based on several different types of data, mostly involving demonstrable differences, not seemingly related to polarity sensitivity, between *any* and *a/an*. If *any* were always simply an indefinite which was sensitive to negative polarity, it should not show further differences with the simple indefinite article. One example is their differential behavior with quantificational adverbs:

- (138) a. A lion is usually majestic.
b. *Any lion is usually majestic.

Another example, which Dayal takes to be especially indicative that free choice *any* can have universal force, is that *any* can be modified by *almost*, while *a/an* cannot.

- (139) a. You may pick almost any flower.
b. #You may pick almost a flower.

For these reasons, I leave these problems for the analysis of free choice *any* as NPI *any* in an implicit conditional to further research.

4.5.2. *Some*

The determiner *some* behaves rather differently from both the indefinite article and from *any*. Even as a singular, it forces different scopes than are available with the indefinite.

(140) John would kick some unicorn.

(140) of course has a sentence-external reading, a reading which can be generated syntactically by leaving the DP in situ and treating the IC as a sentence-external IC, as discussed in section 3.4. This reading is paraphrased as in (141), with the antecedent proposition variable due to the context.

(141) If John were in the place where unicorns live, he would kick some unicorn.

The other reading available to (140) is the wide-scope sentence-internal reading, paraphrasable roughly as in (142).

(142) There is some (conceivable token of) unicorn such that if it existed, John would kick it.

The pattern is clearer in cases where the antecedent property is not existence, but merely presence.

(143) a. John would dance with some debutante.
b. Paraphrase of (143a): There is some debutante such that, if she were in the presence of John, John would dance with her.

The narrow-scope sentence-internal seems entirely impossible for *some*. That is, (143a) seems impossible with a paraphrase as in (144).

(144) If John encountered some debutante, he would dance with her.

This may be connected with the fact that *some* behaves as a positive polarity item (PPI), but not straightforwardly. *some* normally avoids the scope of a negative operator (145a), but it does not normally avoid the scope of a conditional operator; not, for example, in full conditionals (145b).

- (145) a. John didn't see some unicorn. (entails that there exists some unicorn)
b. If John has seen some unicorn, we'll have to revise our biology books. (does not entail that there exists some unicorn)

The effect is also seen with plural *some*, but seems milder there:

- (146) a. John would dance with some debutantes.
b. \checkmark = There are some debutantes that John would dance with.
c. $?#$ = If John encountered some debutantes, he would dance with them.

Contrast:

- (147) a. John would dance with some debutante.
b. \checkmark = There is some debutante that John would dance with.
c. $#$ = If John encountered some debutante, he would dance with her.¹²

¹² The notation “# = ” means that the above example cannot have the reading.

This contrast may be related to the fact that plural *some* has a dual function, serving both as the plural of singular *some*, complete with its scoping behavior, and also as a plural to *a*, which has no plural of its own, in non-negative-polarity environments.

4.6. Conclusion

The behavior of other determiners besides indefinites in sentence-internal ICs largely parallels that of indefinites, but with some differences. Many of these differences can be handled with no extra machinery. For example, the upward-entailing plural determiners allowed for the narrow-scope sentence-internal reading, which is the reading that we predict using just the machinery developed before this chapter.

However, all of the other quantifiers allow a second reading, the wide-scope sentence internal reading. The downward-entailing quantifiers, as well as the singular universal *each* and the PPI indefinite *some*, allow only this reading and the sentence-external reading, while disallowing the narrow-scope sentence-internal reading.

The mechanism I introduced to analyze wide-scope sentence-internal readings is conceptually sound. It is viewed as simply an instance of QR. However, in certain cases, for certain determiners, a second instance of QR *must* take place; the reading which would be predicted if this second QR didn't take place is not attested. For some determiners, namely the downward-entailing ones, the reason for this is clear, but for others, I do not currently have an explanation. In the case of downward-entailing quantifiers it is most likely for pragmatic reasons: the readings generated by the narrow-scope sentence inter-

nal mechanism are simply too implausible. However, the reason why neither *each* nor *some* can have a narrow-scope sentence-internal reading, while seemingly related to other facts noted in the literature for these determiners, remains for further research.

Chapter 5

Propositionally Interpreted Noun Phrases in ICs

5.1. Introduction

This chapter deals with cases where noun phrases in implicit conditionals have a special interpretation. Specifically, they are interpreted as propositions, rather than merely as generalized quantifiers, at least at some level of structure. It should be pointed out that the phenomenon of noun phrases being interpreted as propositions is not limited to ICs in general, but I look specifically at two different cases which interact in important ways with ICs. The first case is the case of indefinite noun phrases, coupled with certain verbs, which end up being interpreted as propositions in the IC construction, but do not retain the same unique interpretation in other constructions. The second case is the case of certain definite process nominals, which behave as if they were indefinite, and as propositions, in ICs, but not in some other constructions.

5.2. Propositional Readings of Indefinites in ICs.

Some ICs with indefinites cannot be properly interpreted given the mechanisms we have laid out up till now. The problematic sentences invariably involve certain types of pro-

positional attitude verbs, and they are generally emotive ones. The problem can be clearly seen with an example like (148).

(148) Officer Barlow would hate an injured civilian.

(148) clearly has a reading in which Officer Barlow is not inclined to bear ill feelings toward injured civilians. Rather, it can mean that Officer Barlow is inclined to hate the fact that a civilian was injured, were this to happen. In other words, the actual civilian is not understood as the theme of the verb hate; rather, a proposition based on the DP is understood as the theme. I will refer to the latter type of reading as the “propositional reading”, and I will refer to a reading where the DP is given a canonical DP-meaning which gets a thematic role from the verb as the “thematic reading”. A natural paraphrase of the propositional reading of (148) is (149).

(149) If a civilian were to be injured, Officer Barlow would hate that fact.

This reading cannot be represented by the analysis as given so far. It seems as if, after movement of the indefinite, instead of applying trace conversion to the lower copy of the DP we have instead converted the DP to a proposition, much the same as we do to the *higher* copy of the DP. For more on the possibilities for analysis, see below.

Furthermore, the data suggest that the reading is confined to the IC construction, or at least, a generalized class including both ICs containing a conditional mood indicated by *would* and generic statements such as (150), which also allows a propositional reading.

(150) Officer Barlow generally hates an injured civilian.

Generic statements of this pattern are similar in many ways to ICs, the difference being that their full-conditional paraphrases are indicative conditionals rather than subjunctive conditionals.

A plain indicative sentence does not allow a propositional reading, in the sense that I mean here. That is, it doesn't have a reading where the relevant proposition incorporates the indefinite, with the meaning of the indefinite DP. In order to test this we must be sure to distinguish plain indicative sentences from generic statements. With this in mind, let us consider (151).

(151) Officer Barlow hates an injured civilian.

(151) does have a propositional reading, when interpreted as a generic. But when interpreted as a simple episodic, it does not. It does have a reading paraphrasable as "There is an injured civilian such that Officer Barlow hates that that civilian was injured," a reading which will be discussed more below. But that is not the reading we are interested in here. It does not have the reading we would expect if, on the non-generic understanding

of (151), we converted the DP to a proposition and interpreted the sentence as such. It does not have a reading paraphrasable as (152).

(152) Officer Barlow hates the fact that a civilian was injured.

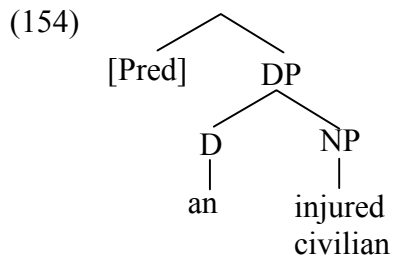
The absence of the propositional reading in plain indicatives is seen more clearly when we look at other determiners, specifically nonmonotonic determiners. While (153a) has a propositional reading, (153b) does not. (And the nature of this example makes it less prone to interference from a generic reading.)

(153) a. John would welcome exactly two candidates.
b. John welcomed exactly two candidates.

Consider a context for (153a) where John wants to speak with two candidates at a time. If more than two are brought to him at the same time he will be extremely displeased, as of course he will also be if one or no candidates are brought to him. In this circumstance, (153a) makes sense, and is construed as saying that if exactly two candidate were brought to him, he would welcome that fact. This is certainly not a thematic reading, as John would not necessarily welcome the candidate himself.

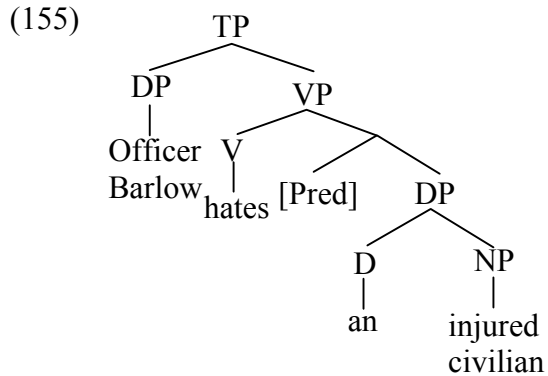
Now consider a later circumstance, where John has in fact been brought exactly two candidates, but the candidates themselves are disappointing. (153b) would not be true in this circumstance; (153b) cannot be construed as saying that John welcomed the fact that exactly two candidates have been brought to him.

These data present a theoretical challenge. There is no obvious way to make sure that DPs which are in ICs can be turned into a proposition, while those not in ICs cannot, since it seems likely that the process by which an indefinite is turned into a proposition is itself local. For concreteness, one promising way to analyze the coercion of a DP into a proposition is to insert the [Pred] just above the DP. I remain neutral for now on whether this is an adjunction or complement-argument structure, but return to the issue below.



This structure will be interpreted as a proposition; exactly which proposition depends on the context, as before. If [Pred] is interpreted as the property of existence, then the structure will be interpreted as the proposition that some injured civilian exists.

If this is indeed our method for deriving a proposition from a DP, then it is not clear what would stop [Pred] from being inserted in a non-IC, episodic sentence, as well, resulting in the unattested reading (152) for (151).



(155) says that Officer Barlow hates the proposition that an injured civilian exists. This is the reading that we *do not* want to generate for (151).

Furthermore, the problem is not just that we would have to stipulate when [Pred] can be inserted. For up until now, it would seem as if [Pred] can only occur in the presence of a conditional operator. If this were generally true, then we could perhaps stipulate an agreement relation between [Pred] and such a conditional operator.

However, such a move would predict that [Pred] could be inserted also with full conditionals. However, we don't observe the propositional reading that we would expect in full conditionals, if [Pred] could be inserted there.

(156) If a civilian were injured, Officer Barlow would hate an injured civilian.

(156) does not have the reading paraphrased in (149). The most salient reading it does have is a thematic reading, where if a civilian were injured, Officer Barlow would harbor ill feelings towards some injured civilian, though not necessarily the one introduced in the antecedent. The only propositional reading (156) could possibly have is the one we

expect if the consequent is an IC on its own, that is, a reading where we understand two separate conditionals, one embedded in the other. This reading is difficult for some speakers to get, however.

(157) If a civilian were injured, then Officer Barlow would be inclined to hate an injured civilian if one were ever injured (again).

As a final point, only a sentence-internal reading of an IC lends itself to a propositional reading for an indefinite. It requires some care to test this, but an IC understood in context, where the indefinite is not understood as forming part of the restrictor, does not allow for a propositional reading. Let us set up a context to test this.

(158) a. There is a war going on. John right now is disposed to support this war. However, he has friends stationed there, and something might happen to them.
b. John would hate a war.

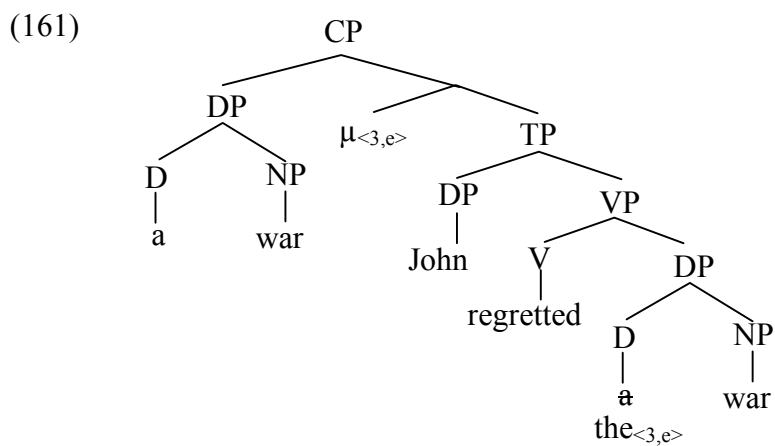
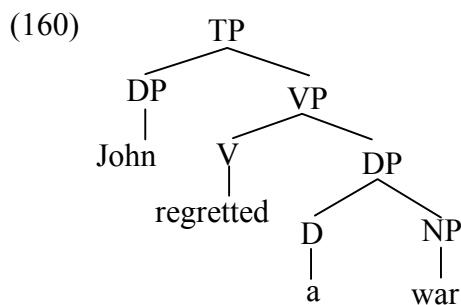
(158b) cannot have the reading “John would hate the fact that there is a war”. It can only have a reading, which is pragmatically somewhat marginal, that involves requantification: “John would find some other war to hate.”

To reiterate, we have an analytical mystery so far. Propositional readings for indefinite DPs (and some other types of DPs) are only available in ICs and generics. They are not available in plain indicatives, nor in full conditionals. And they are not available in ICs where our analysis does not posit movement.

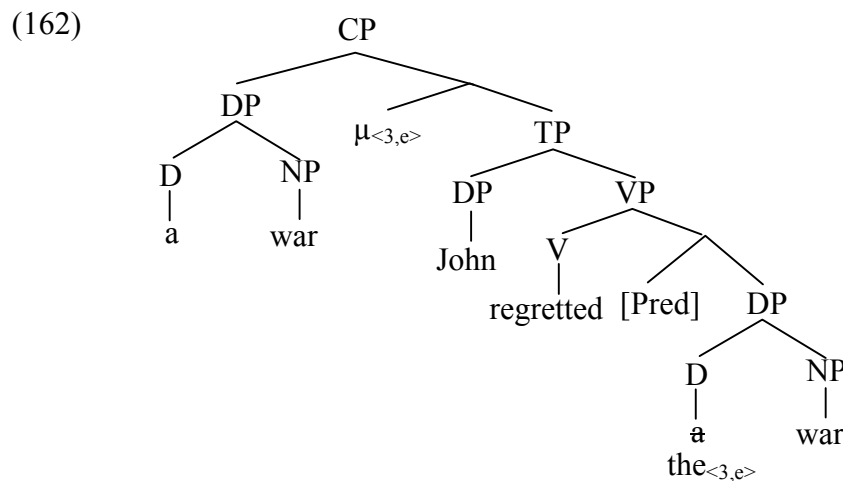
One potential solution is to tie the restriction on propositional readings to the movement of object DPs for type reasons. It is often (but not always) assumed in the literature

(cf. Montague 1973, Heim and Kratzer 1998, and others) that DPs in object position, excepting possibly definite DPs, must raise to a position above the VP, even if they don't end up taking scope over the subject, because they are not of the right semantic type to combine with a transitive verb. Let us apply this generality to propositional attitude verbs which can also take DPs as objects, such as *regret*. For a sentence like (159), we then start with a structure like (160), but must move the DP, resulting in (161), for type reasons.

(159) John regretted a war.



If we assume that this movement is always required whenever a DP occurs as the object of a verb, then we can contemplate what would happen if we insert [Pred] in the position directly above the object position:



[Pred] will then turn the trace-converted DP, rather than the full quantifier, into a proposition. As a result we predict that (159) has as its paraphrase, not (163a) but (163b).

- (163) a. John regretted that there was a war. — # = (159)
 b. There is a war such that John regretted that that war happened. — = (159)

This prediction matches our intuitions; (159) can indeed be read as asserting the existence of a war whose existence John regrets. In fact, it is unlikely that it has any other reading. The verb *regret* is semantically propositional in all its uses; it is unclear what it means to regret an object or an event, except that it means to regret some fact regarding that object or event.

The hypothesis, then, is that a DP object of a verb is always required to move. This blocks the generation of reading (163b) for (159), since in order to generate that reading, we would have to leave the DP in situ and apply [Pred] to it in its object position. Note that in order for this analysis to work, we have to abandon the idea that it is the type mismatch itself that drives object QR. Because once we insert [Pred] between the DP and the verb, there is no type mismatch before raising; [Pred] is of type $\langle e, \langle s, t \rangle \rangle$, and the DP before raising is of type $\langle \langle e, \langle s, t \rangle \rangle, \langle s, t \rangle \rangle$.¹³ This is probably desirable anyway; see Beghelli and Stowell 1997 for arguments that QR in general should be driven by syntactic features.

So the idea is that all DPs (perhaps except definites, that is, all quantificational DPs) must move from their argument positions for syntactic reasons.¹⁴

(164) Principle of QR: Any DP of type $\langle e, st \rangle$ (quantificational DP) in argument position must move to an A' position, either to a c-commanding position or side-ward.

¹³ The only way I can see to salvage a type-driven movement would be to propose that [Pred] is merged, countercyclically, after the movement has already taken place, and that there is an imposed ordering on at what point in the derivation the type-theoretic constraint should be imposed. This analysis, however, would grossly violate cyclicity, and would render the type-theoretic constraint a purely syntactic device completely divorced from interpretation, since the level of interpretation would not be the point at which the constraint would be assessed. Seen in this way, there is no conceptual advantage to the latter approach over the one given in the main text. Therefore I will not consider this option any further.

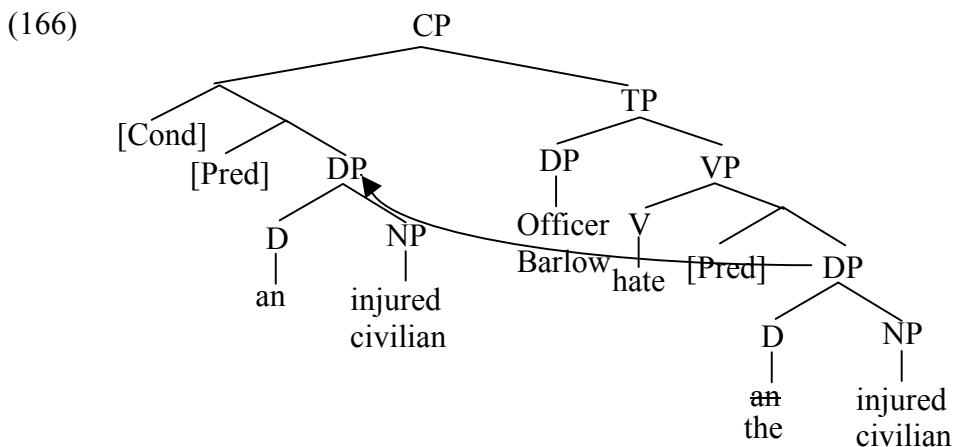
¹⁴ Subject DPs will have to move as well, for the same reasons. Otherwise, assuming that we could still attach [Pred] to the subject, we would predict (ia) to have (ib) available as a reading, deriving from the structure in (ii).

- (i) a. A war surprised me.
- b. The fact that there was a war surprised me.

- (ii) [[[Pred] [a war]] [surprised me]]

We don't require that all quantificational DPs move to a c-commanding position; condition (164) is satisfied by either c-commanding or sideward movement out of the argument position. This way, a DP object in an IC will satisfy the requirement by moving sideward to the covert [Pred] of the antecedent. We then get a structure as in (166) for (148), repeated here as (165).

(165) Officer Barlow would hate an injured civilian.



Unfortunately, so far we predict that we must perform trace conversion here; recalling the discussion in section 3.3.2, we do not want to make trace conversion optional; otherwise, for ICs that *don't* have propositional readings, we would predict requantificational readings, such as a reading such as (167b) for (167a).

- (167) a. John would dance with a debutante.
b. If John encountered a debutante, he would dance with some debutante (not necessarily the one he encountered).

But when we do trace conversion for the propositional reading cases, we end up generating not reading (168a), which is what we want to generate, but reading (168b).

- (168) a. If there were an injured civilian, Officer Barlow would hate the fact that there was an injured civilian.
b. If there were an injured civilian, Officer Barlow would hate the fact that **that** injured civilian existed.

(168b) is probably also a reading available for (165), but it is not the one we are trying to generate. The reading we want is (168a), which is the reading we would have generated if we didn't have to do trace conversion in (166).

So I hereby propose that trace conversion is not required when [Pred] is adjoined to a DP, and the DP is moved sideward, and we must find a reasonable explanation as to why that is. In other words, this is the one case where we do want requantification, or the interpretation of the determiner as is in two different places, contra the case with thematic readings, as discussed in sections 3.3.2 above and 6.2.2 below.

As further evidence that this type of reading is available in propositional-reading sentence-internal ICs, consider again the behavior of the non-monotonic determiner *exactly*, and the sentence (169b) in the context described in (169a).

- (169) a. John has left explicit instructions that no more nor less than two candidates should be brought to his office at a time. He doesn't, however, care which two are brought.

b. John would be pleased with exactly two candidates.

- (170) a. If exactly two candidates were brought to him, John would be pleased at the fact that those candidates were brought to him. — # = (169b) in context (169a)
b. If exactly two candidates were brought to him, John would be pleased with the fact that exactly two candidates were brought to him. — = (169b) in context (169a)

This situation clearly sets the hearer up for reading (170b) for the sentence, and not (170a), since it is not the particular candidates that are brought to John that pleases him, but merely the fact that it is exactly two of them. Since the sentence seems to be good in this context with this reading, we want an analysis that predicts that the determiner should be interpretable in its original form in both positions, its raised position and its base position, contra (166). That is, we should not be required to perform trace conversion on the lower copy in the case of propositional readings of DPs in sentence-internal ICs.

Another mark against (166) as the only possible analysis of (165) is that in (166), the two instances of [Pred] are merged separately; they are two different elements from the numeration. That means that they could be indexed differently and end up denoting completely different properties. This in turn would mean that the proposition that serves as the antecedent to the conditional could be different from the proposition that serves as the argument of the attitude verb. This seems not to be the case. Notice that in paraphrase (170b) it is the same proposition, that exactly two candidates are brought to John, which serves both as the antecedent to the conditional and as the object of the attitude “be pleased with”. We don’t seem to be able to get a reading where the antecedent proposi-

tion and the attitude proposition are different. (171) represents an attempt to set up this type of reading.

- (171) a. John has left explicit instructions that no more nor less than two wizards should be brought to his office at a time. He doesn't, however, care which two are brought. It is unclear, however, how many wizards, if any, exist.
- b. John would be pleased with exactly two wizards.

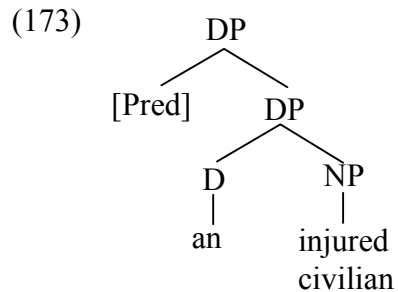
(171b) can now have either of the readings (172a-b), where the proposition is the same in the antecedent and in the consequent. But it can't seem to get reading (172c), where the propositions are different, even though both of the properties involved, that of existence and that of coming into John's office, are made salient by the preceding context (171a).

- (172) a. If exactly two wizards existed, John would be pleased with the fact that exactly two wizards existed. — possible reading for (171b) in context (171a)
- b. If exactly two wizards came into his office, John would be pleased with the fact that exactly two wizards came into his office. — possible reading for (171b) in context (171a)
- c. If exactly two wizards came into his office, John would be pleased with the fact that exactly two wizards existed. — not a possible reading for (171b) in context (171a)

I therefore submit that we want an analysis that will predict that the two instances of [Pred] in the analysis of the propositional reading of a sentence-internal IC should have the same index.

Both of these two problems, the problem of trace conversion and the problem of the identity of the two propositions, can be solved simultaneously, and in a natural way, if we propose that [Pred] moves with the DP. We have so far been unclear about in what way

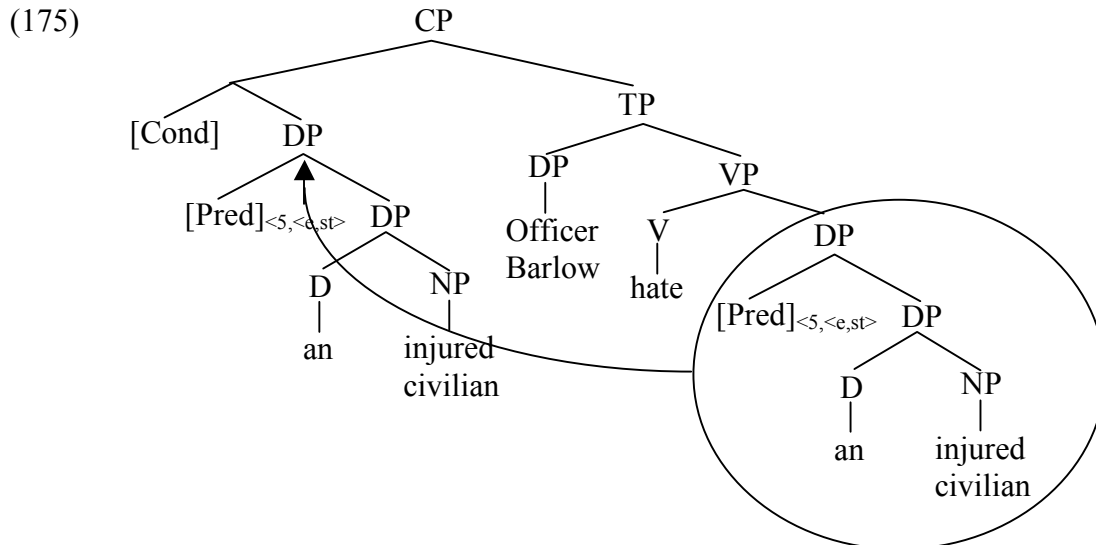
[Pred] attaches to the DP. I hereby propose that it adjoins to the DP, so that the resulting structure still bears the DP label:



Adjoining [Pred] in this way is assumed to be an optional operation. Once it is done, however, it is the entire DP, including [Pred], which is targeted for obligatory QR of the object. Again, this is not for type reasons, as the DP so formed denotes a proposition, which is perfectly capable of combining with a propositional attitude verb. Rather, the movement is necessary because of purely syntactic features, of the type argued for in Beghelli and Stowell 1997.

So the derivation of (165), repeated again as (174), will now be as in (175).

(174) Officer Barlow would hate an injured civilian.



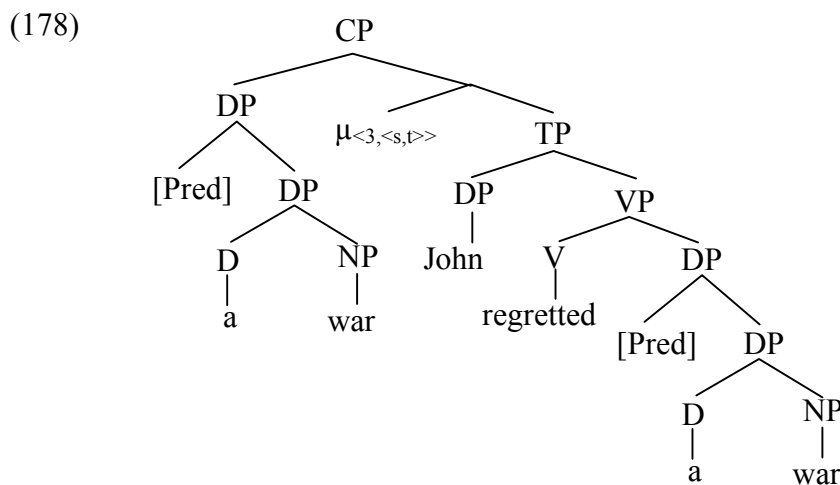
Since the two instances of [Pred] are now copies of each other, they must be indexed the same.

As for trace conversion, I propose that the fact that the DP in (175) does not have a determiner in its left periphery, instead having [Pred], means that it cannot now undergo trace conversion. The general idea is that trace conversion is always an operation that changes a quantificational determiner into the definite determiner; but the operation “sees” only the moving DP, and cannot look very far into that DP to find a determiner to convert. By hypothesis, the operation can only see the first branches of the DP. If this is a quantificational DP, then trace conversion occurs, but if the first branch is something else (such as [Pred]), then trace conversion does not and cannot occur.

- (176) a. John regretted a war.
 b. # = John regretted the fact that there was a war.

We have asserted that the adjoining of [Pred] is optional, and that when adjoined, it renders trace conversion impossible. What then is the consequence of adjoining [Pred] in (176) and then moving the resulting DP to a c-commanding position? The result will be a structure with vacuous binding (178). Since by hypothesis, a DP with adjoined [Pred] does not undergo trace conversion when it moves, there is no way to coindex the lower copy of movement in (178) with the μ operator. So we can rule out (178) by a constraint against a certain type of vacuous binding. More specifically, I propose that whenever a phrase copy-moves to a c-commanding position, if the moved structure is the one which is sent off for interpretation (that is, if the structure does not undergo reconstruction), the unmoved copy must undergo trace conversion of the indexing variety, as discussed in section 3.3.2, so that an operator-variable dependency can be created:

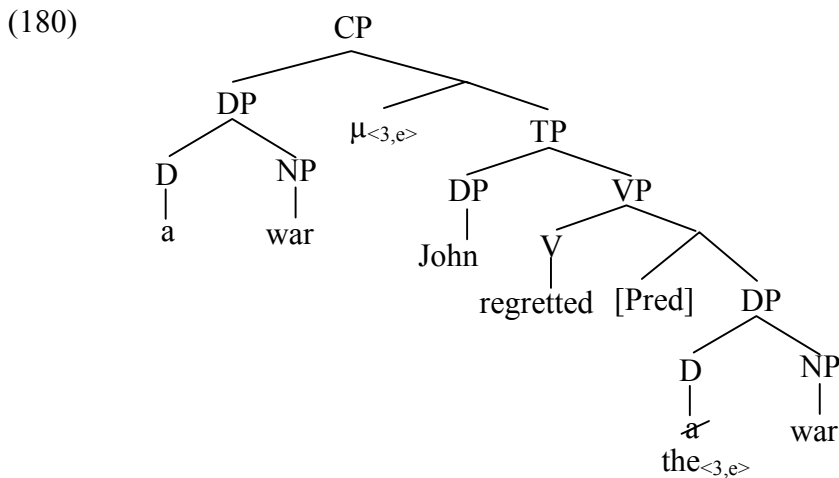
(177) **Proposal:** If a phrase XP moves to a c-commanding position, its higher copy must non-trivially bind a variable in its lower copy.



This amounts to the idea that only certain types of phrases can undergo movement to c-command positions at LF. So far, this includes only DPs, because only for DPs do we have an operation, namely trace-conversion, which can turn the unmoved copy into a dependent variable. This still leaves open the possibility that other types of phrases can undergo movement, provided that either a) the movement is sideward, so that no operator-variable dependency need be created, or b) the movement undergoes reconstruction, so that it is the structure before movement that is interpreted.

We should of course make sure that we derive the *attested* propositional reading of (176). Recall that the reading we want is as paraphrased in (163b), repeated here as (179), and that we analyzed it as (162), repeated as (180).

(179) There is a war such that John regretted that that war happened.



In (180), the DP moves independently of [Pred]. In order to preserve this analysis, we will have to claim that the requirement that object DPs undergo QR can target either the DP proper or the DP with the adjoined [Pred], subject to other constraints such as that on vacuous binding. Perhaps this should be theorized as an optionality in how [Pred] can attach to a DP; it can either adjoin to the DP, such that the DP label projects, or it can merge as a head, projecting its own label. In the former case, QR targets the large DP, including [Pred], while in the latter case, QR targets the lower DP, excluding [Pred].

To review, here is the cluster of assumptions that we have motivated in this section:

- (181)a. A quantificational DP must move at LF from its argument position, either sideward or upward.
- b. [Pred] can be freely added to a quantificational DP.
- c. An unmoved copy of a moved DP whose leftmost element is a determiner must undergo trace conversion. An unmoved copy of a DP whose leftmost element is not its determiner may not undergo trace conversion.
- d. When a DP undergoes upward movement, the lower copy must undergo trace conversion (in order to create an operator-variable dependency). This combined with assumption (c) prevents a DP from moving along with [Pred] when moving upward.

5.3. Propositional Readings and Process Nominals.

5.3.1. The Problem with Process Nominals

It was discussed in section 4.2 that normally, ICs with definite noun phrases inherit the presuppositions of that definite noun phrase. Thus (182a) presupposes that a unicorn exists, and (182b) presupposes that a war is going on (or that a hypothetical one is salient in the discourse).

- (182) a. John would kick the unicorn.
b. John would hate the war.

However, there are some apparent exceptions, some cases of ICs with definite noun phrases which don't seem to inherit the presuppositions of the definite. These tend to involve noun phrases which are eventive, and also have an argument structure, in Grimshaw's (1990) terms. So (183a) does not presuppose that the city in question has been destroyed, and (183b) does not presuppose that that e-mail in question has been forwarded. (They do presuppose, respectively, the existence of a salient city and of a salient e-mail, but that merely shows that the presuppositions of the noun phrases *the city* and *the e-mail* project, not the more complex noun phrases embedding them.) Furthermore, they do not even require a salient mention of a hypothetical destruction or forwarding.

- (183) a. John would protest the destruction of the city.
b. John would protest the forwarding of that e-mail.

In this section I will discuss noun phrases of this type, phrases headed by definite morphology (the article *the*), followed by some type of "process nominal", followed by a definite complement. I will ignore for the most part the case of a process nominal whose complement is indefinite, as in (184).

- (184) a. John would protest the destruction of a city.
b. John would protest the forwarding of an e-mail.

Cases like (184), with an indefinite noun phrase embedded inside a definite process nominal, seem to behave like true indefinites, in contrast to cases like (183). As such, they can have propositional readings of the type seen in section 5.2 for noun phrases like *a war*.

- (185) a. John would protest the destruction of a city.
b. \surd = If a city were destroyed, John would protest the fact that a city was destroyed. (propositional reading)

These would then be analyzed the same way as propositional readings with true indefinites such as *a war*. Although it is in general unclear how trace conversion would work for such a case, since the external article is already definite, in the case of the propositional reading the [Pred] element will be inserted, and hence the issue of trace conversion will not arise. For further discussion of indefinite complements of definite noun phrases, see McNally 1992, who observes that such noun phrases often pattern with true indefinite noun phrases in *there*-insertion contexts.

What seems to set apart the noun phrases which behave like (183), as opposed to (182), is that the former are event nominals with full argument structure. These for the most part coincide with Grimshaw's (1990) "process nominals". Most of these are headed by nouns derived from verbs, but there seem to be some nonderived nominals which show the same behavior:

- (186) John would protest the end of the welfare program.

I will refer to the construction I am interested in here as a “definite process nominal” for short, though the reader should understand this to only include those where an overt complement is present. That is, I am using it only for noun phrases such as “the destruction of the city”, and not those such as “the destruction”, which have different properties. When it is crucial to point out that the construction in question has a complement, I will refer to it as an “event nominal with full argument structure”. I will refer to the phenomenon exemplified in (183), the fact that definite process nominals do not project presuppositions in ICs (or, as we will see, in certain other cases) as the definiteness-removal phenomenon.

5.3.2. Process Nominals As Propositions: External Semantics

The most immediate idea of how to solve this puzzle might be to propose that with process nominals, the definite article is vacuous; it actually has the semantics of the indefinite article or perhaps no semantics whatsoever, but in any case it does not impose a presupposition. The idea that definite articles sometimes lack definite force has indeed been proposed, for syntactic reasons, for related constructions by Grimshaw (1990) and Davies and Dubinsky (2003).

However, such a line of argument, that the definite in a process nominal does not have presuppositions, runs into immediate trouble when we consider episodic non-ICs. (187a-b) both presuppose that the city in question was destroyed, or at least that the possibility that the city might be or might have been destroyed is under discussion; both imply that

only the sentence-external IC analysis is possible for such cases, with a [Prop] pronoun receiving its value as described in section 4.2.

- (187) a. John protested the destruction of the city.
b. John didn't protest the destruction of the city.

This runs counter to the most apparent prediction of a theory that process nominals are simply interpreted as indefinite, since true indefinite noun phrases are not presupposed in a similar environment.

- (188) a. John protested a war.
b. John didn't protest a war.

Thus the idea that definite process nominals are semantically equivalent to an indefinite noun phrase is unlikely to carry much weight.

Analytically, a good way to look at the problem is that, unlike indefinite noun phrases, definite process nominals don't ever clearly display the behavior of scoping over the verb. What I mean here by "scoping over the verb" is that the indefinite noun phrase cannot occur as a direct semantic argument of a verb, but rather must raise and take as its argument some constituent containing the verb. (This is the traditional "raising for type reasons" discussed at length in Heim and Kratzer 1998 and other literature.) An indefinite must scope over the verb of which it is the object (or subject), except in cases of sideward movement (to which we turn below), which was the entire point of section 5.2. So we get a structure for (188) such as (189), where we introduce the propositional reading by the

familiar [Pred] element, [Pred] applies to the trace-converted copy of *a war*, whereas the moved copy takes scope over the verb, and operates on a constituent containing the verb.

- (189) a. $[[a \text{ war}]_8 \text{ John protested } [\text{Pred } [\bar{a}/\text{the war}]_8]]$
b. $[\text{Neg } [a \text{ war}]_8 \text{ John protested } [\text{Pred } [[\bar{a}/\text{the war}]_8]]]$
c. $[[a \text{ war}]_8 [\text{Neg John protested } [\text{Pred } [[\bar{a}/\text{the war}]_8]]]$

This way, (189a) ends up asserting that there exists a war such that John protested the fact that it exists, while (189b) asserts that there is not such a war, and (189c) asserts the existence of a war such that John did not protest the fact that it existed. (187) differs crucially in not offering an assertive interpretation; (187a) cannot be understood as asserting the existence of “a destruction” of the city which John protested, nor can (187b) be understood as negating the existence of such a destruction.

Put this way, the conclusion is that definite process nominals do not scope above the verb, at least not in any familiar way; not in a way similar to how indefinites do. This immediately raises the question of what the semantics of a definite process nominal is.

Let us consider the range of denotations traditionally assumed to be available for DPs (in English). Generally, those headed by the definite article *the* and by demonstratives are of type e ; all other DPs are of type $\langle\langle e, t \rangle, t \rangle$. In the system considered here, definites are of type e and other DPs are of type $\langle\langle e, \langle s, t \rangle \rangle, \langle s, t \rangle \rangle$. Either way, the definites are the only types of DPs that can occur as direct arguments of the verb.

However, up until now we do not have any DPs which are both of type e and are pre-supposition-less. Since type- e entities are the only thing that a verb can take as its semantic argument (as opposed to the DP taking the verb phrase as its argument), we end up

predicting that any DP which is taken by the verb as its semantic argument will be presuppositional. This is exactly what we don't want in the case of definite process nominals, for although we do get presuppositions in the indicative cases in (187), we don't get them in the IC cases in (184). Furthermore, as (190) shows, even in indicatives we don't always get presuppositions. It seems to depend on the verb. (190a-b) don't presuppose that the city was destroyed. In fact, they assert that it wasn't.

- (190) a. John prevented the destruction of the city.
- b. John didn't allow the destruction of the city.

This once again contrasts with the behavior of true definite DPs. (191a-b) only make sense if there is a salient hypothetical war in the discourse which John prevented from coming into actuality.

- (191) a. John prevented the war.
- b. John didn't allow the war.

But a hypothetical, previously discussed destruction is not required in (190). This suggests that the presupposition displayed in (187) is due not to any semantic definiteness of the (morphologically) definite process nominal, but rather due to the choice of verb, "prevent" in this case.

All of this suggests that we want a semantics for definite process nominals that is not presuppositional, but which can occur as a direct semantic argument of the verb. We want

this at least as an optional denotation for definite process nominals; they can probably have a standard denotation as an event or as an individual as well.

This, coupled with a few other assumptions, such as those motivated in section 5.2, will derive the two facts observed above: a) the fact that in the indicative episodic sentences, the choice of verb determines the presence or absence of presuppositions, and b) the fact that in ICs, there are no presuppositions regardless of the choice of verb.

Fact a) is correctly predicted because with the verb scoping over the DP, the verb can induce and project its own presuppositions. This is impossible with regular indefinite DPs because when the DP scopes over the verb, it plugs the verb's presuppositions. This is presumably why even the canonically factive verb *regret* does not project any presuppositions when it takes a DP object.

- (192) a. John regrets a war.
b. John does not regret a/any war.

Fact b) is correctly predicted because in ICs, the DP moves sideward to the left-periphery conditional structure, and the resulting proposition plugs the presuppositions of factive verbs, which includes *protest*. As we saw in section 4.2, this would not plug the presuppositions of a true definite DP, since in that case the DP itself moves and projects its presuppositions. But if definite process nominals do not have presuppositions of their own, then their raising to the left periphery will not cause any presuppositions to project.

With this motivation for analyzing definite process nominals as elements with no presuppositions but which occur as direct arguments of verbs, we must turn to their semantic

type. They can probably not be of generalized-quantifier type, because that type will scope over the verb. (We could type the verb up so that it could directly take a generalized quantifier as argument, and hence project its own presuppositions, but the availability of such a type-lifting operation for verbs would incorrectly predict that the presuppositions of verbs could project in the case of indefinite DPs as well, contra (192).)

They also probably can't be of the type of individuals or of events, at least not in the cases we are interested in, where the definiteness goes away. This is because it is unclear how to derive such a denotation from a complex phrase without using presuppositions. For example, if we wanted *the destruction of the city*, in a given situation *s*, to denote a single event, namely the event with the properties of being a destruction in *s* and having the city as its theme, then what should the phrase denote if no such event exists in situation *s*? In the system here, the denotation is #, the symbol for presupposition failure. But we do not want presupposition failure in the case of definite process nominals. We could create some other type of behavior specifically for process nominals in the case where they fail to denote an event or individual, but any such device would be a sharp departure from traditional assumptions.

One traditional semantic type such that phrases of that type occur as direct arguments to verbs, but which do not necessarily induce presuppositions of their own, is the type of propositions. A proposition is generally understood as occurring as an argument of a propositional attitude verb. In turn, some propositional attitude verbs induce presuppositions, while others do not.

I would like to propose, therefore, that definite process nominals, in the cases where they exhibit the effects of not having semantic definiteness (and hence do not project presuppositions), denote propositions:

(193) **Proposal:** Definite process nominals can denote propositions.

As we will discuss further in section 5.3.3 below, the claim here is that different types of noun phrases propositionalize differently, which is contra Zucchi 1993, whose argument assumes that all noun phrases, or at least all otherwise event-denoting noun phrases, behave the same way when joining with attitude verbs.¹⁵

Let us see first how the analysis works. The proposal is that, for example, the phrase *the destruction of the city* can denote the proposition that the city was destroyed:

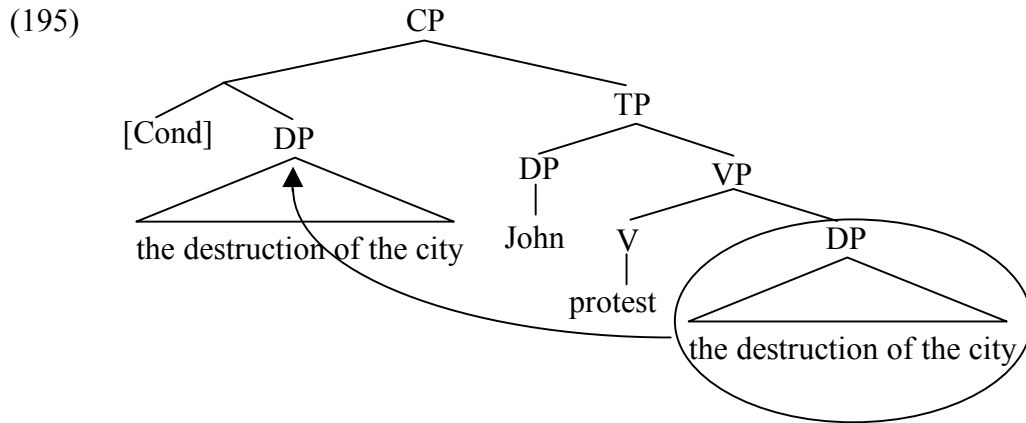
(194) $[[\text{the destruction of the city}]] = \lambda s \text{ the city is destroyed in } s$

We will turn to the ways we can derive this semantics compositionally below. But first let us see why this semantics will explain the presuppositionality facts.

First, the behavior in implicit conditionals is expected. Since the moving element denotes a proposition, we will start with a left-periphery structure that only includes the

¹⁵ Another possibility would be that definite process nominals can denote *properties*, e.g. properties of events. Then the semantics of the verb could act on the property to give the right meaning, e.g. *regret the destruction of the city* would mean $[\lambda s \lambda P \lambda x \ x \text{ regrets that } \exists e \ P(e)](\lambda e \ e \text{ is a destruction of the city})$, coupled with the appropriate presuppositions. This, however, would require two departures from the traditional analyses of lexical categories: verbs are not normally understood to take properties as arguments, and DPs are not normally understood to denote properties.

[Cond] operator. The DP then copy-moves to the sister position of [Cond]. Both copies are interpreted the same way, as the proposition that the city was destroyed.



This results in a structure similar to the propositional readings of indefinites in section 5.2. Anticipating the analysis of the facts in indicatives, we assume that the verb *protest* is factive, and has a denotation which we can somewhat informally represent as in (196).

$$(196) \llbracket \text{protest} \rrbracket = \lambda p_{\langle s, t \rangle} \lambda x_e \lambda s \# \text{ iff } \neg p(s); 1 \text{ iff } p(s) \wedge x \text{ stages, in } s, \text{ a protest about the fact that } p$$

The interpretation is as follows:

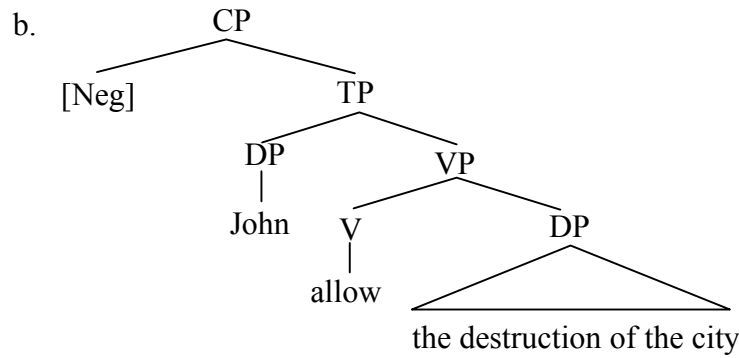
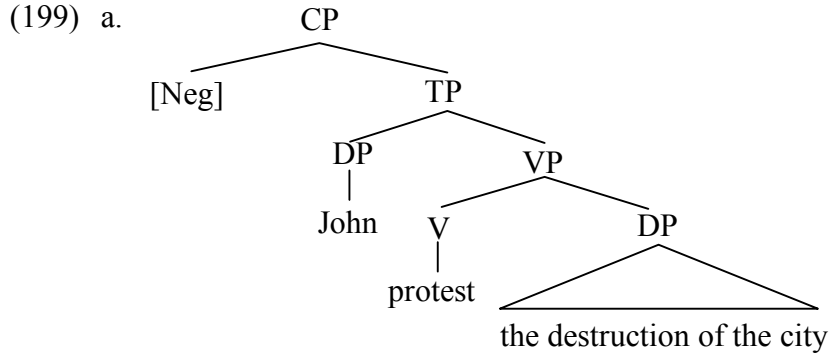
- (197) a. $\llbracket \llbracket \text{Cond} \rrbracket \rrbracket (\llbracket \text{the destruction of the city} \rrbracket) (\llbracket \text{protest} \rrbracket (\llbracket \text{John} \rrbracket) (\llbracket \text{the destruction of the city} \rrbracket)) =$
 b. $\llbracket \llbracket \text{Cond} \rrbracket \rrbracket (\lambda s \text{ the city is destroyed in } s) (\lambda s' \text{ John stages, in } s, \text{ a protest about the fact that the city is destroyed}) =$
 c. $\lambda w \forall s [\text{ClosestSituations}(\min(\lambda s \text{ the city is destroyed in } s))(w)(s) \rightarrow \exists s' [s \leq s' \wedge \text{John stages, in } s', \text{ a protest about the fact that the city is destroyed}]] =$ (paraphrasing)
 d. If the city were destroyed, John would stage a protest about the fact that the city was destroyed.

This is as we want. The presuppositionality of the verb *protest* doesn't make a difference here, that is, the verb does not have an opportunity to case a global presupposition failure, since such presuppositions are plugged by the antecedent of the conditional, which asserts that the city is destroyed, the very thing that *protest* presupposes in the consequent.

Let us now turn to the indicative cases. We noted there that with some verbs, we get a presupposition that the city was destroyed, and with others we don't:

- (198) a. John didn't protest the destruction of the city. — presupposes that the city was destroyed
 b. John didn't allow the destruction of the city. — does not presuppose that the city was destroyed

In this case, there is no movement of the propositional DP, because there is no conditional structure to move to. (Upward movement of the DP would probably not change anything about presuppositions, but such movement is ruled out anyway by principle (177) in section 5.2.) So we have the structures in (199):



We assume a semantics for *protest* as in (196). This time, if the destruction of the city did not take place, we will get a presupposition failure for (199a). Let us assume that the negative element [Neg] operates on propositions, and hence has a semantics such as (200).

$$(200) \llbracket \llbracket \text{Neg} \rrbracket \rrbracket = \lambda p_{\langle s, t \rangle} \lambda s \neg p(s)$$

Then (199a) has the interpretation as in (201):

$$(201) \text{ a. } \llbracket \llbracket \text{Neg} \rrbracket \rrbracket (\llbracket \text{protest} \rrbracket (\llbracket \text{John} \rrbracket) (\llbracket \text{the destruction of the city} \rrbracket)) =$$

- b. $[\lambda p_{\langle s, t \rangle} \lambda s \neg p(s)]([\lambda p \lambda x \lambda s \# \text{ iff } \neg p(s); 1 \text{ iff John protests, in } s, \text{ the fact that } p](\lambda s \text{ the city is destroyed in } s)(\text{John})) =$
- c. $\lambda s \# \text{ iff the city is not destroyed in } s; 1 \text{ iff John does not protest, in } s, \text{ the fact that the city is destroyed}$

For *allow*, however, we assume a non-presuppositional semantics such as (202).

(202) $[[\text{allow}]] = \lambda p_{\langle s, t \rangle} \lambda x_e \lambda s \ x \text{ takes no action, in } s, \text{ which causes } p \text{ to not be true.}$

Thus, for (199b) we get (203) as an interpretation, which agrees with the facts.

- (203) a. $[[[\text{Neg}]]]([\text{allow}]([\text{John}]([\text{the destruction of the city}]))) =$
- b. $[\lambda p_{\langle s, t \rangle} \lambda s \neg p(s)]([\lambda p \lambda x \lambda s \text{ John takes no action, in } s, \text{ which prevents } p](\lambda s \text{ the city is destroyed in } s)(\text{John})) =$
- c. $\lambda s \text{ John takes some action, in } s, \text{ which prevents the city from being destroyed}$

So, the proposal is that whenever we get the definiteness-removal effect with definite process nominals, we are dealing with a propositional reading of the process nominal.

This makes the rather sharp prediction that there should be no definiteness-removal effect in a context where no propositional reading is available. For when definite process nominals denote events, we assume that they denote *definite descriptions* of events, just like normal definite noun phrases such as *the war*. This translates to the prediction that in an IC, if a definite process nominal is present but could not be interpreted as a proposition, then in that IC the definite process nominal must project its presuppositions. We will now test this prediction.

As background, note that it is almost certainly not true that definite process nominals can only denote propositions in general. Sometimes they seem to denote something like events, as seen in the following examples:

- (204) a. John saw the destruction of the city.
b. The forwarding of that e-mail lasted .2 seconds.

In (204a), on the most natural reading, it is asserted that John was a direct (visual) witness to the event of the city being destroyed. The sentence is not true if John merely knew that, or “saw that”, the city was destroyed. Likewise, it is unclear what (204b) would mean other than the assertion that a particular event lasted a particular amount of time, though see section 5.3.4 below regarding the *take time to* expression.

Therefore, we predict that with ICs with definite process nominals, combined with predicates that only take events and not propositions, should give rise to sentences where the definite process nominals project presuppositions. Here are the examples:

- (205) a. John would see the destruction of the city. — ?? = If the city were destroyed, John would see the event of the city being destroyed.
b. The forwarding of that e-mail would last .2 seconds. — ? = If that e-mail were forwarded, the event of its being forwarded would last .2 seconds.

The judgments here are unclear, especially for (205b). Nevertheless, the speakers I have consulted find a contrast between (205) and (184), suggesting that eventive readings of definite process nominals do not lend themselves to the definiteness-removal effect that

we see in ICs with verbs like *protest*, and also in indicative conditionals with verbs like *allow*.

I have proposed that definite process nominals can be interpreted as propositions that do not have presuppositions. This is in contrast with regular definite noun phrases, as well as process nominals without full argument structure, as seen from the following examples:

- (206) a. John would protest the destruction of the city.
- b. John would protest the destruction.
- c. John would protest the war.

(206a) displays the definiteness removal effect, and is interpreted saying that if the city were destroyed, John would protest that the city was destroyed. By contrast, (206b) and (206c) do not display the definiteness-removal effect. (206b) presupposes that there is some relevant destruction of something, either in actuality or hypothetically considered in the discourse, which under some contextually specified circumstance John would protest, or would protest the fact that that thing was destroyed. (206c) presupposes the same thing about some war. In other words, (206b) and (206c) are sentence-external ICs.

This does not necessarily mean that there is no propositional reading, in any sense, for *the destruction* and *the war* in those sentences. But it is not the same type of propositional reading that *the destruction of the city* gets. To the extent that *the war*, for example, can get a propositional reading, it is a proposition that has presuppositions, namely, the proposition that the war, whatever “the war” is in context, took place, which the existence and uniqueness of such a war presupposed. Roughly, the denotations for the three types

of DPs on their propositional readings is as follows (though the full definite process nominal can also, optionally, have the other type of reading as well; see below). We will modify these denotations when we establish the precise compositional semantics of the structures.

- (207) a. $\llbracket \text{the destruction of the city} \rrbracket = \lambda s \text{ the city is destroyed in } s$
b. $\llbracket \text{the destruction} \rrbracket = \lambda s \#$ iff nothing is destroyed in s ; 1 iff the relevant destruction in s exists in s
c. $\llbracket \text{the war} \rrbracket = \lambda s \#$ iff there is no war s ; 1 iff the relevant war in s exists in s .

5.3.3. Internal Semantics of Process Nominals as Propositions

Now we must turn to the question of how definite process nominals can come to denote propositions in the first place, and why other types of morphologically definite noun phrases cannot denote propositions of the same type, namely those without presuppositions.¹⁶

Zucchi (1993) argues that any propositional readings of noun phrases arise due to ambiguities in the semantics of the verb, with the noun phrases themselves unambiguously denoting individuals or events. In this, he argues against Vendler (1967, 1968, 1975), who defended what Zucchi calls the “ambiguity hypothesis”, namely that at least some noun phrases are themselves ambiguous between an eventive reading and a propositional reading.

¹⁶ I will not have here a fully satisfying explanation for the latter question, of why there should be a fundamental difference between process nominals with full argument structure, and other types of nominals. I can only point out Grimshaw’s (1990) work, which discovers many other special properties of process nominals with full argument structure, unrelated to the facts discussed here. All of it suggests a fundamental syntactic difference between process nominals with full argument structure and other noun phrases, but the syntactic differences that Grimshaw proposes do not immediately predict the difference that I present in the current section, and I must leave that connection to future work.

Because of evidence we have already seen, Zucchi's alternative to the ambiguity hypothesis will not work. That is, we have already seen that definite process nominals cannot unambiguously denote definite descriptions of events, because of the lack of presupposition projection seen in examples like (184) and (198b), repeated here as (208) and (209), compared with the presence of presupposition projection seen in (210) below.

(208) John would protest the destruction of a city. — does not presuppose that the city has been destroyed.

(209) John didn't allow the destruction of the city. — does not presuppose that the city was destroyed

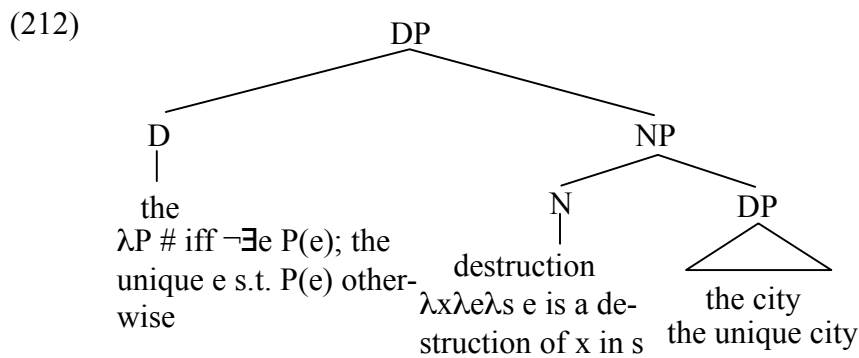
We *do* want to say that definite process nominals can *sometimes* denote definite descriptions of events, due to the meaning, as well as the presupposition projection, in (210), and its contrast with (211).

(210) a. John saw the destruction of the city.
b. John didn't see the destruction of the city.

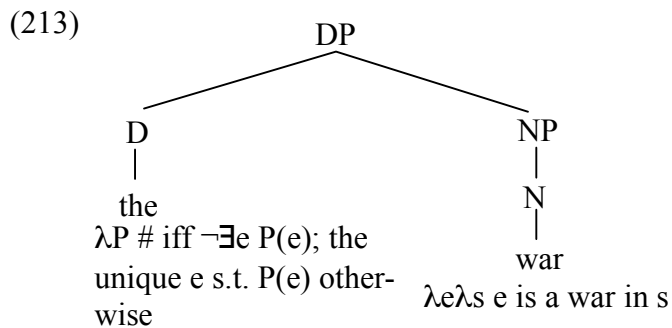
(211) John would see the destruction of the city. — ?? = If the city were destroyed, John would see that event.

Therefore, "ambiguity", at least at the phrasal level, of definite process nominals seems to be unavoidable. It seems, however, to be limited to definite process nominals, that is, eventive nominals with full argument structure, due to the differing presupposition projection behavior of nominals like *the war* and *the destruction* seen in (206).

We therefore want a grammatical mechanism that can allow definite process nominals to denote either definite descriptions of events or propositions. It seems reasonable to assume, as Zucchi does, that the event denotation is basic. I represent this by assuming that an NP like *destruction of the city* is underlyingly a property of events (composed of the relational noun *destruction* and the individual-denoting *the city*), and the definite article *the* is a presuppositional choice function that can derive either a single event (type v) or a single individual, depending on the NP.

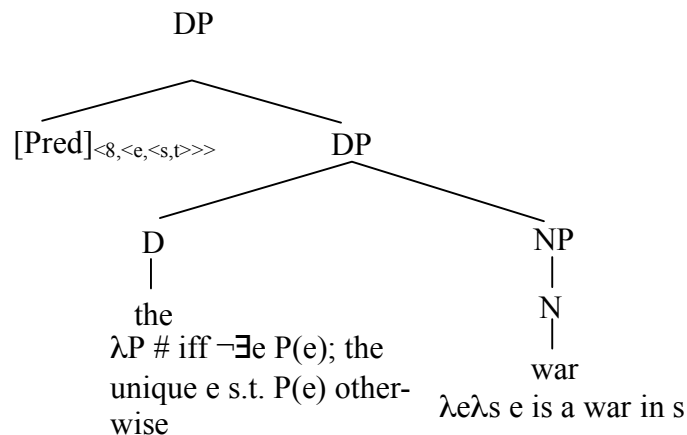


Essentially the same underlying type of semantics should be assigned to a non-process eventive nominal:



Now, we propose that there are two possible ways of turning a noun phrase into a proposition. One method is available to all DPs, and this is to attach [Pred] at the top (214). I call this method “External Coercion”, since the element which turns the DP into a proposition occurs outside the DP itself. In the case of definite DPs, this method will allow the presuppositions of the definite to project to the top. This is why (215) requires, either in the actual world or in some hypothetical world under discussion, the existence of a war. We still want to use the structure in (214), however, because the verbs *protest* and *prevent* seem to be propositional. That is, the proposition taken as argument by *protest* in (215a) is the proposition that *the war* occurs, where the sentence incurs a presupposition failure if there is no referent found for *the war*.

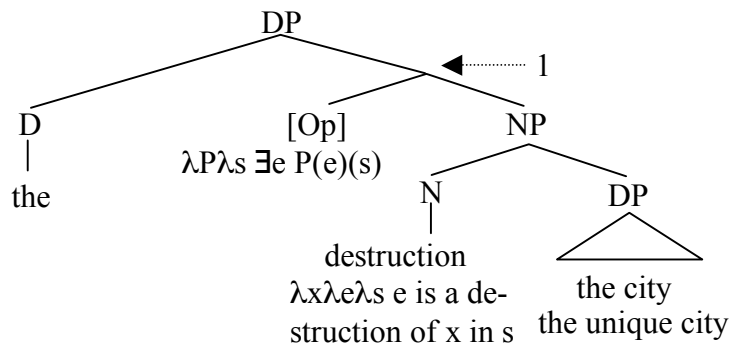
(214) External Coercion



- (215) a. John would protest the war.
 b. John prevented the war.

However, for definite process nominals, we have another option. We can interrupt the formation of the noun phrase by inserting an operator between the NP and the D, creating a proposition out of a property (with no presuppositions). I refer to this process as “Internal Coercion”.

(216) Internal Coercion



The denotation we end up with for node 1 in (216) is the proposition that an event of the city being destroyed exists, which is equivalent to the proposition that the city was destroyed. The Operator introduced here differs from [Pred] in two ways: it operates on a property (of events, namely the property of being a destruction of the city) rather than on an individual or quantifier, and its denotation is fixed; it is not a pronoun whose value is determined by the assignment. This latter difference makes a prediction that seems to be correct: that when we have definiteness-removal with definite process nominals, the proposition that we introduce, based on the property of events denoted by the NP, is always the proposition that the event *exists*, and not some other proposition. This contrasts

with the behavior of indefinite noun phrases in ICs, as well as sentence-external ICs, where the property or proposition that we introduce varies contextually. But there does not seem to be any context where, for example, (206a) would mean that if the destruction of the city were done with a nuclear device, John would protest that fact, *while simultaneously displaying the definiteness-removal phenomenon*.

The denotation we get for node 1 in (216) is actually the denotation we want for the entire DP. It is, then, unclear what the role of the definite article is. If the NP really does denote a proposition, then it denotes a set of worlds; we do not then want the definite article to have its typical choice-function behavior, for then it would pick out a single world from the set of worlds denoted by the NP.

I see two main possibilities. On the one hand, we could say that the definite article is vacuous in these cases. Then, the entire DP would simply inherit the propositional denotation of node 1.

On the other hand, we could say that [Op] does not actually turn the NP into a proposition, but rather into the singleton set containing the corresponding proposition:

$$(217) \llbracket [\text{Op}] \rrbracket = \lambda P \{ \lambda s \exists e P(e)(s) \}$$

That way, the definite article could display its standard choice-function behavior and pick out the single proposition in this set, again resulting in the DP denoting the proposition that we want it to denote.

This latter option is the one I endorse, since it allows the definite article to do what it always does: pick the sole member of a singleton set.

5.3.4. Appendix: The *take x-much time to* Construction

In (204) and (205), we tested for purely eventive readings for definite process nominals. One of the tests employed the *last x-much time* predicate, repeated here.

- (218) a. The destruction of the city lasted 2 months.
- b. The destruction of the city would last 2 months. — ?? = If the city were destroyed, that event would last 2 months.

Clearly, however, a sentence with *take x-much time to* fares a lot better with, seemingly, such a meaning:

- (219) The destruction of the city would take 2 months.

However, I argue here that this *take x-much time to* construction does not test for eventhood.

First, the construction can take an agentive argument:

- (220) The destruction of the city would take John 2 months to complete.

(220) does not just describe something about the hypothetical event of John destroying the city. Rather, it has more to do with John's abilities in relation to the *task* of destroying the city. Indeed, an apt paraphrase might be (221).

(221) John could not destroy the city in less than 2 months.

It is likely that all *take x-much time to* constructions work similarly; they are predicates of an agent and a task. In cases where there is no explicit agent, an implicit one is understood, perhaps expressed syntactically by an arbitrary PRO:

- (222) a. The destruction of the city would take PRO_{arb} 2 months.
b. Meaning: It would take someone 2 months to destroy the city.
c. OR: One could not destroy the city in less than 2 months.

All of this suggests that the *take time to* construction does not test for whether a phrase denotes an event, because in fact the construction operates on a denotation which is more complex, namely the ability of an agent to perform a task, which is a more propositional denotation.

5.4. Gerunds

This section looks at the interaction between the implicit conditional construction and the gerund construction. The focus is on two main varieties of gerund, often called the Acc-ing construction and the Poss-ing construction.

The Acc-ing type gerund is a phrase consisting of a subject in the accusative case, followed by a verb phrase whose verb is in the gerund form, with *-ing*. A typical example is (223), where the gerund clause itself is underlined.

(223) Him winning the match surprised me.

The Acc-ing construction behaves in a way rather parallel to definite process nominals, in that an IC with an Acc-ing clause is interpreted as a conditional whose antecedent comes from the semantic content of the clause, and the gerund denotes a proposition.

A Poss-ing gerund is a phrase whose subject is in the possessive, or genitive, case, and whose verb is again in the *-ing* form. Basic examples follow:

(224) a. Mary's arriving late bothers me.
b. I regret John's drinking so much.

Poss-ing behaves similarly to a definite noun phrase, in that an IC with a Poss-ing clause tends to presuppose the truth of the clause, and its antecedent has to be supplied by the context. I will conclude that this is due to a morphological difference between Acc-ing and Poss-ing, where Acc-ing has indefinite properties whereas Poss-ing has indefinite properties.

5.4.1. Syntax of Acc-ing and Poss-ing

The most comprehensive study to date of the syntactic differences between Acc-ing gerunds and Poss-ing gerunds in English is Abney (1987). He notes several syntactic differences between the two constructions, dividing it between “external evidence” and “internal evidence” for his conclusion (which he later revises) that Poss-ing gerunds are noun phrases, while Acc-ing gerunds are clauses. We will introduce later a modified version of this proposed structural difference, which will also let us state their semantic differences with respect to ICs.

On the external evidence side, he notes two basic facts: facts about agreement and about long-distance binding.

Regarding agreement, he notes that two conjoined subject Acc-ing gerunds trigger singular agreement on the verb, whereas two conjoined Poss-ing gerunds trigger plural agreement:

- (225) a. John coming and Mary leaving bothers/*bother me.
b. John’s coming and Mary’s leaving *bothers/bother me.

Acc-ing behaves like finite clauses in this respect, while Poss-ing behaves like noun phrases:

- (226) a. That John came and that Mary left bothers/*bother me
b. The destruction of the city and the construction of the temple *bothers/bother me.

These data have to be refined, since it seems that Acc-ing gerunds are not completely barred from triggering plural agreement, the situation hinging on whether the two conjoined clauses are taken to refer to two separate events or one complex event. I will return to discussion of this below, when I discuss my proposal.

Secondly, he notes that an anaphor can be long-distance bound into Poss-ing, but not into Acc-ing:

- (227) a. They thought that each other's giving up the ship was forgivable.
b. ?*They thought that each other giving up the ship was forgivable.

For the internal evidence, Abney cites different restrictions on the subjects of the gerunds, as well as differences with respect to wh-properties, scope, and sentential adverbs.

On the other hand, Abney notes that Acc-ing is similar to Poss-ing with respect to the positions that they occur in; they both must occur in Case positions. This is especially seen from the fact that both can undergo subject-aux inversion.¹⁷

¹⁷ The probative value of examples like (228) may be compromised by the arguments of authors such as Delahunty (1983) and Davies and Dubinsky (2000), who argue that even finite clauses are sometimes licit in subject-aux positions and other tests for DP-hood (arguing against, for example, Koster 1978 and Stowell 1981, who argue that such examples are always bad and that they show that sentential subjects are in A-bar position)s. Delahunty, for example, gives (i), his (11).

- (i) To what extent did that Fred failed to show up anger those of his devoted fans who had waited by the stage door since dawn of the previous day?

Davies and Dubinsky's conclusion from these facts is to say that sentential subjects are dominated by a DP node.

I remain neutral here on the consequences of these arguments. They are not important for my point, which is simply that gerunds clearly show behaviors similar to canonical DPs, and that furthermore, as we see below, Acc-ing and Poss-ing behave differently in important respects.

- (228) a. Does John smoking stogies upset you?
b. Does John's smoking stogies upset you?

5.4.2. Acc-ing in ICs

Acc-ing clauses are quite natural in ICs, both as subjects and objects. In both cases the most salient reading is where a propositional reading of the Acc-ing clause serves as the understood antecedent of the conditional.

- (229) a. John would hate Mary winning the match.
b. Mark would regret John choosing Bill to run the store.
c. Russia declaring war would surprise me.
d. Mark winning the match would impress me.

For example, the prominent reading of (229a) is “If Mary won the match, John would hate that Mary won the match”, and that of (229c) is “If Russia declared war, then it would surprise me that Russia had declared war.”

In order to analyze this interpretation, we have to reflect on what is the basic compositional meaning of an Acc-ing construction. What we find is that it behaves quite similarly to the event nominals with full argument structure as found in section 5.3. It can be interpreted propositionally, in ICs as in (229) and also in indicative sentences. In indicative sentences with presuppositional verbs, we get presupposition projection again: (230a) presupposes that Mary dropped the ball.

- (230) a. John regrets Mary dropping the ball.
b. Russia declaring war surprised Mark.

It can also be interpreted as an event, though as with the process nominals, the cases of clear eventhood have to be carefully tested for.

(231) Mary singing the song lasted 6 minutes.

The reason it is so difficult to test for is that we cannot use perception verbs, at least not with the Acc-ing clause as the object. As shown by Reuland (1983), what looks like an Acc-ing construction as the object of a perception verb is most likely a very different construction. For example, it is impossible to passivize the subject of a normal Acc-ing out of its clause (232), but this is possible with a perception verb (233).

(232) a. Mary regrets John making the cake.
b. *John was regretted making the cake.

(233) a. Mary saw John making the cake.
b. John was seen making the cake.

Also, the subject DP of an Acc-ing clause can normally not scope out of the clause, but it can with a perception verb.

(234) a. John regretted everyone singing the song. —Can only mean “John regretted the fact that everyone sang the song”.
b. John saw everyone singing the song. —Can mean “John saw the event of everyone singing the song (at once)” or “Everyone is such that John saw them singing the song (possibly at different times)”.

However, in a passive subject position, we probably can force a true Acc-ing clause with a perception verb. A wide scope reading for the quantifiers in (235) is not possible, giving (235b) an anomalous judgment.

- (235) a. Everyone singing the song was seen by John.
b. ?#No one singing the song was seen by John.

Despite the data in (235), I will only accept as a test for the event-denoting property of Acc-ing the *last time* construction, which itself has ambiguous judgments.

- (236) ?John singing the song lasted 5 minutes.

To the extent that (236) is good, we must still conclude that an Acc-ing gerund can denote a single event.

In general, the Acc-ing construction displays the same behavior with respect to presuppositions as does the definite process nominal construction. As with definite process nominals, then, we probably don't want to analyze the Acc-ing construction as denoting an indefinite generalized quantifier over events, for then we would expect (237a) to have a readings something like (237b), with no presuppositions projected.

- (237) a. John protested Mary baking the cake.
b. There is an event of Mary baking the cake such that John protested that that event happened. — # = (237a)

However, there is one case in which Acc-ing seems to have a more indefinite eventive character, in direct contrast to definite process nominals: in predicate position, as suggested by the comparison between (238a) with Acc-ing and (238c) with an indefinite, and that between (238b) with a definite process nominal and (238d) with (arguably) a plain definite.

(238) Speaker A: John often reads the book.

Speaker B: I don't believe you.

Speaker A: Oh yeah? Look at that! [Points to a TV screen showing a dubious occurrence.]

a. Speaker B: That/That scene is not John reading the book.

b. Speaker B: #That/#That scene is not John's/the reading of the book.

c. Speaker B: That/That scene is not a recording of John reading the book.

d. Speaker B: #That/#That scene is not the recording of John reading the book.

Using *that scene* instead of simply *that* ensures that we are reading the sentence as containing a true Acc-ing clause in (238a), and not an object control structure as with perception predicates. This suggests that in predicative uses, Acc-ing can serve as an indefinite, or perhaps it can directly denote a property of events.

To review the implications of the data here, it seems that Acc-ing is most naturally interpreted as a proposition. It can also be interpreted as a single event with varying degrees of acceptability, and as a property of events in very special circumstances. I therefore develop a theory below in section 5.4.4 which reflects these facts; it establishes a proposition as the basic denotation for an Acc-ing construction, with the other types of denotations derived from the basic structure in exceptional ways.

5.4.3. Poss-ing in ICs

Acc-ing and Poss-ing clauses are used in many of the same environments, but there are various syntactic differences between them, many of which are noted by Abney (1987) and others. I want to concentrate here on a more semantic difference, the tendency for Poss-ing clauses to be more presuppositional. This claim is by no means easy to test, of course, since as discussed in section 5.4.2, in declarative sentences the truth of an Acc-ing clause tends to be presupposed as well, arguably due to presuppositions of the verb.

A Poss-ing gerund can also denote a single event; this time we can use the perception verb test, since there is no interference from an object-raising type of construction (239a). The *last time* construction also works better with Poss-ing than with Acc-ing (239b).

- (239) a. John saw Mary's baking the cake.
b. Mary's baking the cake lasted 1 hour.

But implicit conditionals once again provide a testing ground for the presuppositional-ity of the structure. We find that in ICs, Acc-ing clauses end up not being presupposed, while Poss-ing clauses in most cases do, though there is some speaker variation here.

- (240) a. John would hate Mary's arriving late.
b. Mark's winning the match would surprise me.

(240a) has more the flavor of an IC with a plain definite (241a) or an eventive nominal without full argument structure (241b) than it does the flavor of an IC with an indefinite (242); (240a) presupposes that it is already under discussion that Mary might arrive late.

- (241) a. John would hate the war.
b. John would hate the destruction.

(242) John would hate a war.

The same property holds when we use nonpresuppositional attitude verbs:

- (243) John prevented Mary's arriving late. — presupposes that the possibility of Mary arriving late is under discussion.

However, there is dialectal variation here. Some of my consultants accept examples like (240) with a nonpresuppositional, “out of the blue” reading parallel to my judgments on Acc-ing structures. Also, the nature of the subject seems to make a difference; speakers seem more likely to accept ICs with Poss-ing if the subject is a (possessive) pronoun such as in (244):

- (244) a. She would disapprove of my calling her.
b. ??She would disapprove of John's calling her.

The analysis I propose in the following section will have some speculations on where this dialect variation might lie.

5.4.4. Propositional Coercion of Gerunds

The preponderance of the data on gerunds, with the exception of the data in (238) suggesting that Acc-ing can behave as a true indefinite, suggests that Acc-ing structures can undergo Internal Coercion into a proposition, as can definite eventive nominals with full argument structure, while Poss-ing structures can only undergo External Coercion.

In what follows I will sketch a preliminary analysis of this difference between Poss-ing and Acc-in, on the basis of a relatively familiar style of syntax for the two constructions. As with the uniqueness of definite process nominals among noun phrases in being able to accept Internal Coercion, the uniqueness of Acc-ing as opposed to Poss-ing in being able to accept Internal Coercion will not directly follow from the syntactic difference. (There may be dialect variation in the possibility of Internal Coercion with Poss-ing anyway, which should warn us against proposing an analysis where impossibility of Internal Coercion is inherent to the Poss-ing construction.) But we can at least suggest possibilities for where the coercion operator would go in the two cases, and this in turn will suggest the type of constraints we would impose on the structures to derive the facts we observe.

It has been observed many times in the literature (Ross 1967, Horn 1975, Reuland 1983, Abney 1987, and others) that a) the Poss-ing construction displays more canonically “nominal” properties than the Acc-ing construction does, though b) they both behave more nominally than (finite and infinitival) clauses do, and c) both behave more like clauses than true noun phrases (including the so-called “Ing-of” construction) do.

Fact b) is shown, for example, by the fact that both Acc-ing and Poss-ing can occur as objects of prepositions, contra finite clauses (245) (Abney 1987, p. 171, clause-type annotations added).

- (245) a. I learned about John's smoking stogies. — Poss-ing
- b. I learned about John smoking stogies. — Acc-ing
- c. *I learned about that John smokes stogies. — finite clause
- d. *I learned about (for John) to smoke stogies. — infinitival clause

Fact c) is shown by the fact that both Acc-ing and Poss-ing constructions can contain an object which receives accusative case, without the aid of a preposition, which is impossible with a true noun phrase.

- (246) a. Mary kissing him was disturbing.
- b. Mary's kissing him was disturbing.
- c. The kissing *(of) him was disturbing.

Fact a), the crucial distinction between Poss-ing and Acc-ing, comes up in more subtle context. For example, coordination of two Poss-ing constructions is more felicitous with plural agreement on the verb, while coordination of two Acc-ing constructions goes better with singular agreement, the latter behaving more like the situation with clauses (247) (Abney 1987, p. 175).

- (247) a. That John came and that Mary left bothers/*bother me.
- b. John coming (so often) and Mary leaving (so often) bothers/*bother me.
- c. John's coming and Mary's leaving *bothers/bother me.

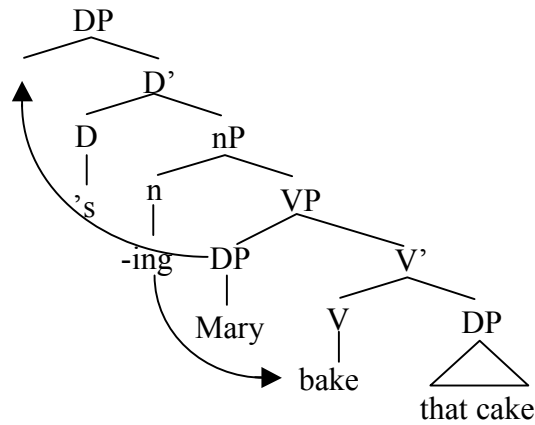
This cluster of facts leads Abney to analyze both Poss-ing and Acc-ing as having some clausal structure internally, but being DPs externally, but with Poss-ing having more internal nominal structure and Acc-ing having more internal clausal structure. That is, the head which changes the clause to a nominal, which for Abney is the *-ing* morpheme itself, is inserted higher up in the clause in Acc-ing and lower in Poss-ing.

This results in the presence of more nominal structure in Poss-ing, and more structure in Acc-ing (specifically, for Abney, the presence of a determiner in Poss-ing, vs. the presence of an Infl head in Acc-ing), and this accounts for the differences observed between them. The fact that both structures are assumed to have VPs within them explains that both can have accusative objects, and the fact that both are DPs externally explains their occurrence as objects of prepositions.

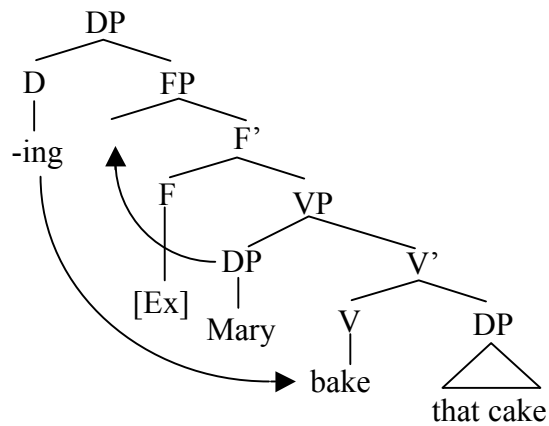
Other authors have proposed more dramatic differences between the constructions. Reuland (1983), and more recently Pires (2001a, b, 2006, 2007), have proposed that Acc-ing is clausal all the way up, that it is a TP (in modernized terms). However, these authors still concede that there are nominal features of some sort on the head of the construction. I find Abney's evidence that Acc-ing is a DP, as well as my own expansion on it (Schueler 2004), much more compelling, so I will assume that both Acc-ing and Poss-ing are in some sense DPs; they both have "DP" as their dominating category.

I present here a simplified and modified version of my analysis in Schueler 2004 of the structure of Poss-ing and Acc-ing, which in turn is similar in spirit to Abney's (1987) analyses.

(248) a. Poss-ing



b. Acc-ing



The head “F” in (248b) is used as a placeholder for any number of heads in the Infl system (cf. Pollock 1989, Beletti 2002). The reason I label it [Ex] will become clear shortly. The important aspect of F, as we will see shortly, is what types of semantics it might have.

The head “n” in (248a) is viewed as simply a category changer (cf. Marantz 1997). I assume that that is what the morpheme *-ing* always does in gerunds: it changes category. (I make no claims here about progressive *-ing*.) Gerund *-ing* always changes a clausal

projection into a nominal projection. Exactly what its label is, however, depends on what it attaches to. (For more details on the syntactic theory I assume here, see Schueler 2004.) But in (248b), where *-ing* attaches to the F head, it takes on the D label. I assume that this is the only function of *-ing*, to change syntactic category; it has no semantic denotation (or equivalently, it denotes a cross-type identity function). On the phonetic side, in both types of gerund *-ing* undergoes a type of affix lowering, or “affix hopping”, to attach to the verb.

Now, let us make some assumptions about the semantics of the heads involved in these structures. We will adopt a neo-Davidsonian analysis of the semantics of verbs (see Parsons 1990, Schein 1993, and others), in which a sentence asserts the existence of some event with certain properties. Suppose, then, that a VP denotes a property of events, and it is the F head (more precisely, some head in the Infl system) which provides the existential closure over events. Continuing with the example above, we have the following, where *v* is the type of events.

- (249) a. $\llbracket \text{bake} \rrbracket = \lambda y \lambda x \lambda s \lambda e [e \text{ is a baking event} \wedge \text{Theme}(e) = y \wedge \text{Agent}(e) = x] \text{ in } s$
 b. $\llbracket \text{Mary bake that cake} \rrbracket = \lambda e \lambda s [e \text{ is a baking event} \wedge \text{Theme}(e) = \text{that cake} \wedge \text{Agent}(e) = \text{Mary}] \text{ in } s$

$$(250) \llbracket \llbracket \text{Ex} \rrbracket \rrbracket = \lambda P_{\langle s, \langle v, t \rangle \rangle} \lambda s \exists e P(s)(e)$$

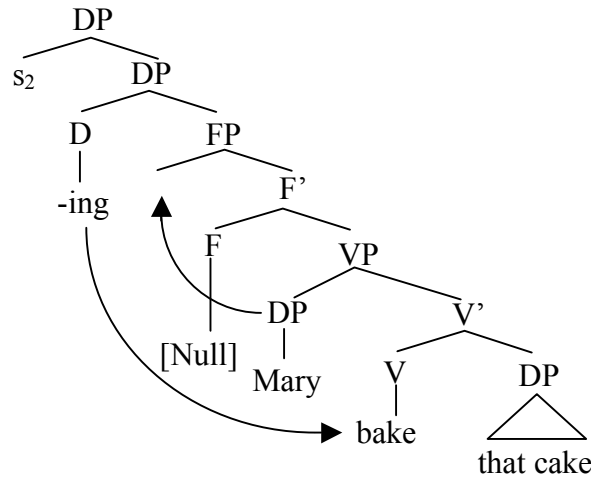
In this conception, the Acc-ing structure has already been turned into a proposition by the time *-ing* is merged, while in Poss-ing, the 's determiner merges directly on the VP which denotes the property of events, before the existential closure can merge.

Seen in this way, the propositional reading of Acc-ing comes for free. Assuming, as I have mentioned, that *-ing* is semantically vacuous, no matter what its label is, (248b) already denotes a proposition of the appropriate type, one without presuppositions. The challenge for Acc-ing, instead, is to see how an Acc-ing gerund can come to denote a single event, as in (251a) (assuming that this judgment is solid), or a property of events, as in (251b).

- (251) a. Mary baking the cake lasted 1 hour.
b. That (scene) is not Mary baking the cake.

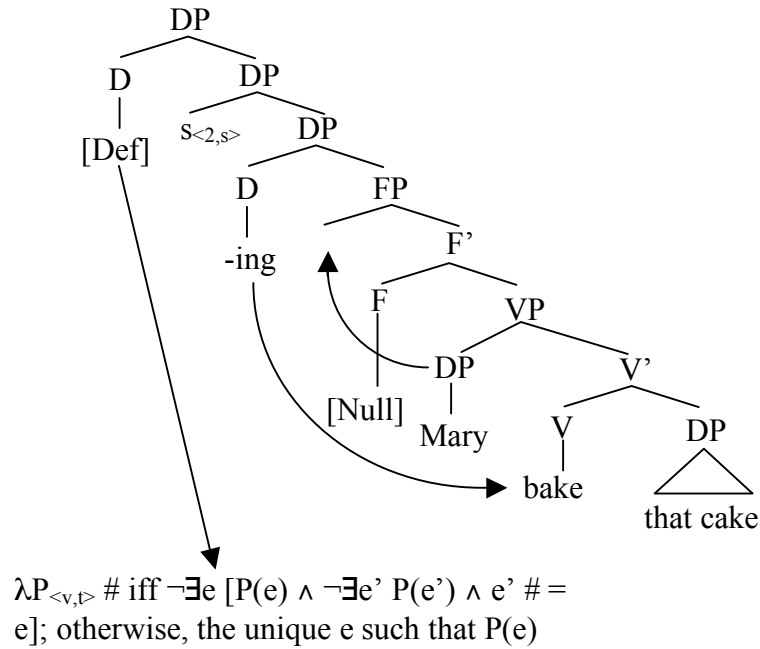
Because in (251), the Acc-ing clause is denoting an event and not a proposition, we have to assume that sometimes the [Ex] existential closure element does not have to be merged in Acc-ing. Sometimes, perhaps, we can just leave the structure denoting a property of events, as a normal VP does in finite clauses (Parsons 1990); perhaps in those cases the Infl elements that are merged are semantically vacuous, or they deal with tense and aspect properties of the event, but do not existentially close it.

(252) Acc-ing: Property denotation



Other times, when we want the construction to denote a single event, we still do not existentially close the event, and in addition we merge a silent determiner with many of the properties of *the*, and with a meaning parallel to 's, which will be discussed below.

(253) Acc-ing: Event denotation



Although I have labeled two different nodes in (253), my assumption is that these are perhaps separate projections within the DP, though I leave it open for now what the difference between them is. It may be that the higher node is available specifically because *-ing* has been merged, where *-ing* has no semantics. However, to the extent that, or for those speakers for whom, (251b) is not acceptable, perhaps this silent [Def] determiner does not exist after all.

Let us now turn our attention to the Poss-ing construction. As I mentioned, in Poss-ing the *-ing* morpheme is attached before the existential closure operator [Ex] can be attached. Since *-ing* changes the category of the structure to the nominal domain, no head in the Infl system can be merged now. In normal cases, the next item to merge is instead the 's determiner. Keeping in mind the data, which suggests that Poss-ing structures normally denote single events, let us propose then that the semantics of 's is like that of [Def] above, a definite choice function over a predicate of events:

$$(254) \llbracket 's \rrbracket = \lambda P_{\langle e, t \rangle} \# \text{ iff } \neg \exists e [P(e) \wedge \neg \exists e' P(e') \wedge e' \neq e]; \text{ otherwise, the unique } e \text{ such that } P(e)$$

This, of course, captures the presupposition that an event with the property denoted by the VP must exist in the situation of evaluation.

Recall, however, that Poss-ing structures *can* denote propositions, but they denote propositions with presuppositions:

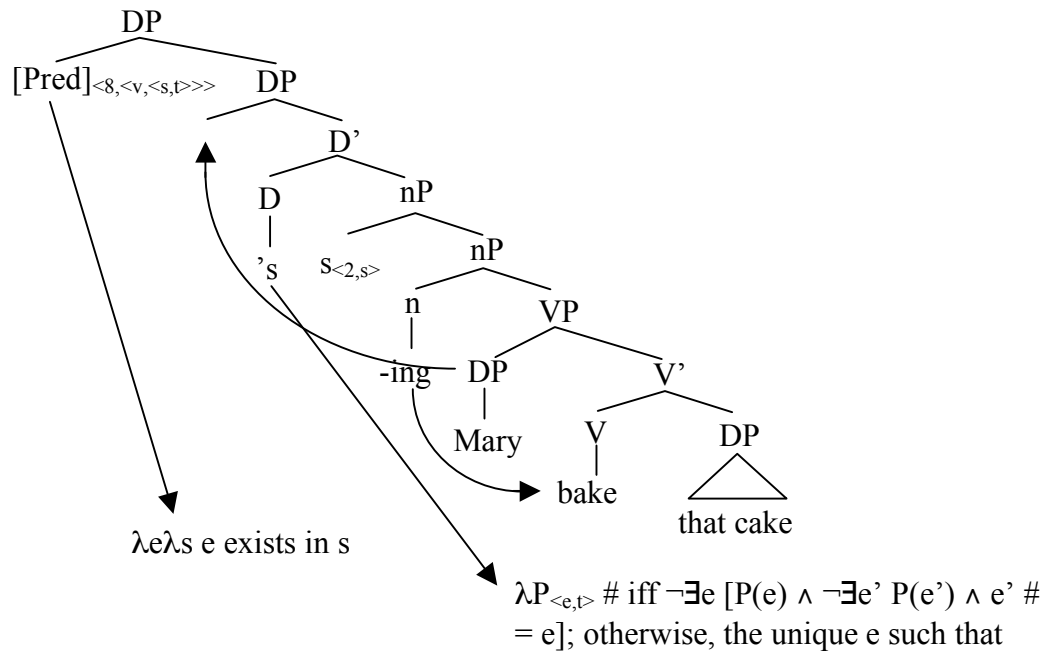
- (255) a. We would regret Mary's baking the cake. — presupposes that Mary's baking the cake is under discussion.
 b. John prevented Mary's baking the cake. — presupposes as above.

This is, of course, parallel to the fact that simple noun phrases can denote such propositions:

- (256) a. We would regret the war. — presupposes a (possibly hypothetical) war under discussion.
 b. John prevented the war. — presupposes as above.

Therefore, the Poss-ing construction can undergo External Coercion, as other noun phrases can. This consists, as before, simply of attaching a [Pred] element to the construction, after the determiner has already been merged.

(257) Poss-ing: External Coercion



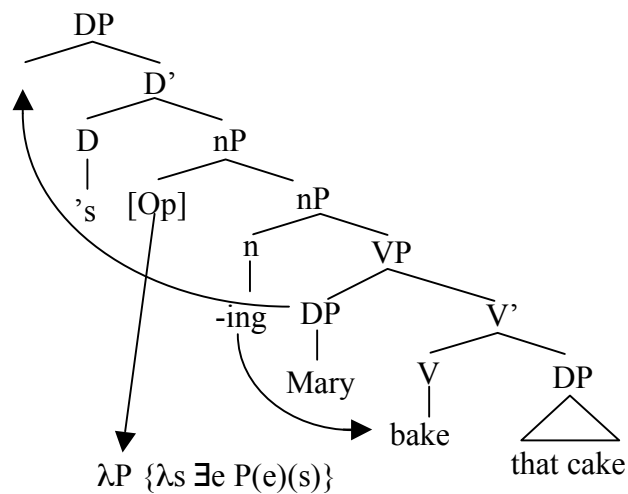
Now, recall that in section 5.3.3 we proposed that what sets definite process nominals apart from other noun phrases is that a special coercion operator can be attached in definite process nominals below the position of the definite article *the*, and that the article in turn can pick out simply the *proposition* denoted by the NP plus the operator, and not pick out or impose presuppositions on the property of events itself. This is the operation we named “Internal Coercion”. Since *'s* is functioning much the same way as *the*, we might wonder why the same Internal Coercion would not be available for Poss-ing as well.

Perhaps this is exactly where the dialect difference noted in section 5.4.3 lies. Perhaps for some speakers, Poss-ing can indeed undergo Internal Coercion, whereas for other speakers it can't. This may well be tied to the availability of the Acc-ing construction for such speakers, as it seems that acceptance of Poss-ing without presuppositions correlates negatively with the degree of acceptability of the Acc-ing construction in the first place. We may be observing a blocking effect here, then, coupled with an economy factor. That is, for speakers for whom Acc-ing is a natural construction to use in ICs without presuppositions, the operation which allows Poss-ing to serve a similar function, which is economically more costly than simply using Acc-ing, is not available.

I will not formalize here the reason why the operation for Poss-ing is more costly, but it must have to do with the fact that the existential closure head for Acc-ing is the same one that occurs in normal clauses, and it is done by a part of the Infl system, which is part of the normal merge order of the clause. The [Op] element, however, is a special operator,

an operator which has a slightly different semantics from [Ex] (since it makes a singleton set of a proposition rather than a bare proposition), and it adjoins to nominal categories, but presumably not in the normal course of things. That is, in Grimshaw's (1991, 2000) terms, the [Ex] element is part of the extended projection of the verb, but the [Op] element is not part of the extended projection of the noun (or of anything else, for that matter), so that is why insertion of the latter is economically costly.

(258) Poss-ing: Dialectally Available Internal Coercion



5.5. Finite Clauses

We have been investigating the interaction of the IC construction with phrases denoting propositions. The types of phrases we have considered so far, however, have been noun phrases and gerunds, both of which are arguably of category DP. In this section we con-

sider the interaction of the IC construction with the more canonically proposition-denoting category: CP.

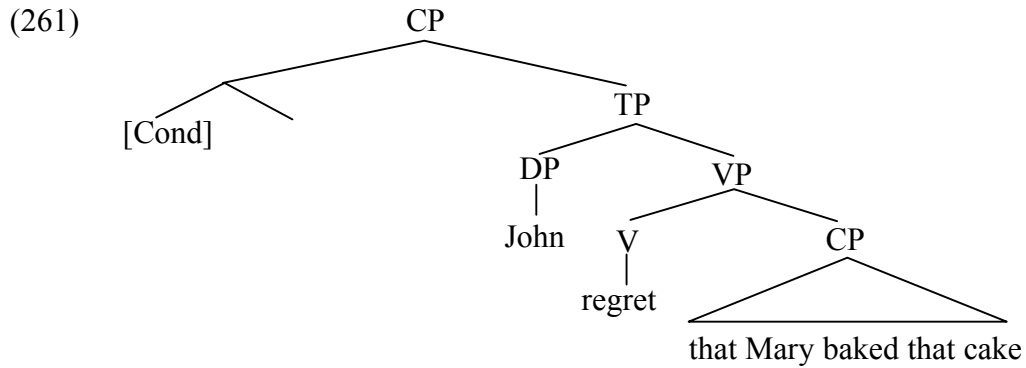
5.5.1. Presuppositions of ICs with Finite Clauses

Given what we have said up until now in this chapter, we find something unexpected when we combine ICs with finite clauses. The analysis of definite process nominals in particular, found in section 5.3, requires that when we have a proposition-denoting phrase in an IC, even when the embedding verb is presuppositional, presuppositions do not project to the clause. But when *that*-clauses are merged with factive verbs, we get presupposition projection again:

- (259) a. John would regret that Mary baked that cake.
b. # = If Mary baked that cake, John would regret it.

- (260) a. John would be surprised that Mary started a war.
b. # = If Mary started a war, John would be surprised that she did.

(259a) and (260a) are ok only in a context that presupposes at least a hypothetical idea that Mary might bake the cake, or that she might start a war, respectively. Again, we might expect the opposite; if we assume that (259-260) start with an IC structure as in (261), then we would expect to derive the (b)-readings by copy-moving the clause side-ward to the conditional operator.



However, if the CP in (261) cannot move to the conditional operator, then we would expect the very presuppositions we find in (259-260). This is because the verb *regret* will then impose its own factivity, and the CP will have no way of getting to the antecedent position of the conditional to plug the presuppositions of *regret*.

Given the arguments in section 5.2, it does indeed seem to be the syntactic category of a phrase that determines whether it undergoes QR-type movement or not. Although we have seen a few proposition-denoting phrases which undergo movement to the conditional left periphery, these, including propositionally coerced indefinites and definite process nominals, were all syntactically DPs. I propose, then, that being a syntactic DP is a necessary condition for being able to move to the conditional left periphery. A CP, such as a *that*-clause, cannot, despite the fact that it might have exactly the same semantic type, perhaps even the same denotation, as a corresponding DP which would be able to move from the same position.

Chapter 6

The Case For Movement In Sentence-Internal Implicit Conditionals

6.1. Introduction

Up till this point in the thesis I have been assuming that the sentence-internal analysis of the relevant readings of certain ICs is the only reasonable one for such cases. That is, for readings such as (262b) for (262a), I have been assuming that we need an analysis of (262a) in which part of the antecedent to the understood conditional structure comes in some sense directly from the content of the sentence itself, and not from the background context of the conversation as with sentence-external (readings of) ICs.

- (262) a. John would kick a unicorn.
 b. If a unicorn existed, John would kick it.

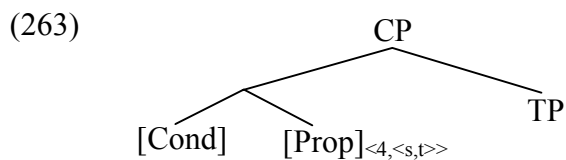
Furthermore, I have assumed that the mechanism by which the antecedent of the conditional is formed is by movement of a DP from the main clause to the covert antecedent structure. In this chapter, I will back up this claim by investigating some other possible analyses of the phenomena that we have been studying in this thesis. I will show that these analyses can generate much of the same data as the analysis defended in the thesis, but ultimately, they make inferior predictions, as well as having some conceptual shortcomings.

In section 6.2 I argue against a type of analysis where the understood antecedent of an IC is *always* determined entirely by the context, even in the case of readings which I have called “sentence-internal” readings. In section 6.3 I turn to possible analyses which are like the movement analysis defended in this thesis in that they derive part of the understood antecedent from the overt structure of the sentence in some way. But these analyses do not derive this relationship between the understood antecedent and the overt structure of the sentence through movement; rather they accomplish it via a system of coindexing. The problem with these latter analyses, I argue, is that they overgenerate; they rely on a mechanism with no well-understood constraints and so end up generating readings, in some cases, that are not attested. The movement analysis, by contrast, I argue to have the proper descriptive power to rule out such unattested readings.

The reader should keep in mind that the alternative analyses I argue against here are not actual analyses found in the literature. They are developed for the purpose of this thesis, as a means of exploring alternative directions in analyzing the same set of facts. The analyses may bear a resemblance to the work of other authors’ accounts of related facts (such as von Stechow 1994, Kasper 1992), but it seems best to develop alternative analyses that are parallel to the one defended here, in order to easily compare them. It is of course possible that an author who favors another direction of analyses could overcome the problems that I point out here for the implementations of those analyses. But the movement analysis is one well-developed analysis that has a high degree of descriptive adequacy for the relevant facts.

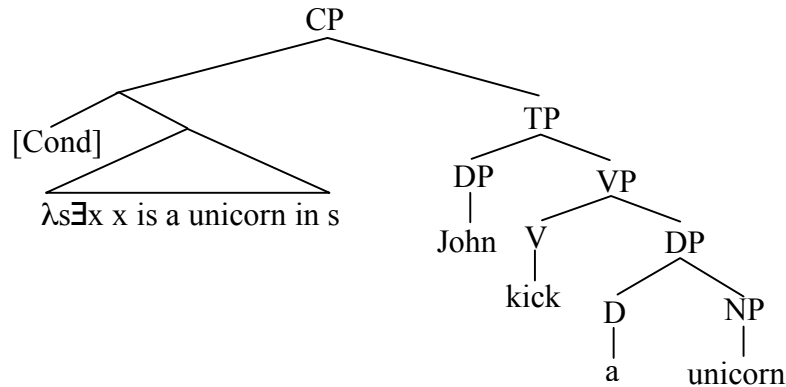
6.2. A Sentence-External Analysis of Sentence-Internal ICs

In studying the data presented in chapter 2, it might occur to the reader that for all of the ICs presented there, perhaps the understood antecedent could be formed from the context alone, in a manner similar to the way I derive sentence external readings in section 3.4. Although there are many other possible formal ways to do it, for concreteness let us assume that such an approach would analyze all ICs as in (263), where we have an explicit pronoun of the proposition type in the conditional left periphery whose value is determined by the assignment, and hence by the discourse context.



Such an approach would propose, for example, that for (262a), an antecedent of the form “a unicorn exists”, or the like, is supplied purely by the context. A first approximation to the resulting structure of the example, then, would be (264), with the semantic value of [Prop] in the relevant context filled in for convenience.

(264)



6.2.1. Contextual Salience

In addition to the requantification problem, there is perhaps a much simpler issue at stake with the hypothetical analysis considered in this section. This problem is anticipated by the discussion in section 4.2. There we outlined the different possible sources for the value of [Prop] in sentence-external ICs. We concluded that [Prop] must get its value from the context, which means that whatever proposition [Prop] ends up denoting must be somehow “familiar” in the discourse, by virtue either of being known to be true in that discourse, or by virtue of being under discussion.

Let us say that a proposition p is familiar in this sense in a discourse context c . We have seen that in that case, we are able to have [Prop] denote p . In turn, with [Prop] denoting p in the antecedent of an IC, we can have elements in the main clause which presuppose that p . In particular, we can have definite noun phrases whose presuppositions are met by p , even if those presuppositions are not met by c itself, in the case where p is simply “under discussion” in c .

Well, in the analysis we are considering in this section, all ICs are sentence-external ICs. That means that all ICs are resolved by means of [Prop] in the antecedent. This

should predict that a reading for (265a) paraphrasable as (265b) should be impossible if the idea of a unicorn existing is not under discussion in the discourse.

- (265) a. John would kick a unicorn.
- b. If a unicorn existed, John would kick it.

This is, I believe, contrary to fact, though the judgments are subtle. The judgments are clearer, however, in the case of propositional readings.

- (266) a. John would hate a war.
- b. If a war occurred, John would hate that a war had occurred.

(266a) clearly requires no special discourse context to be understood as paraphrased in (266b). However, a purely sentence-external analysis of (266a) runs into the same problem that that type of analysis of (265a) does: the only way it can derive interpretation (266b) is if the understood denotation of [Prop] is the proposition that a war occurs. But under our current assumptions, the only way for [Prop] to denote that proposition is for the proposition that a war occurs to be currently under discussion. But that is not a requirement for uttering (266a).

The only way out of this problem would be to assume that [Prop] can denote any proposition it likes, with no constraint that its denotation be supplied by the context. But that move would certainly overgenerate: it would predict that (267a) could be interpreted as in (267b), out of the blue!

- (267) a. John would visit Paris.
b. If the US took over France, John would visit Paris.

Also, contra section 4.2, the purely sentence-external analysis would predict that a definite noun phrase could occur without the proper context in an IC. So a sentence like (268a) would then be fine on a reading paraphrased as (268b), since we are assuming on the sentence-external analysis that [Prop] could be resolved by the assignment as the proposition in (268c).

- (268) a. John would kick the unicorn.
b. If a unicorn existed, John would kick the unicorn.
c. $\lambda s \exists x$ x is a unicorn in s

I conclude, then, that a purely sentence-external analysis of ICs is likely to fail. There is no way to resolve the understood antecedent correctly without making some reference to the overt content of the IC. I now turn to a different type of problem which arises for non-movement analyses, this one arising for both sentence-external and sentence-internal analyses.

6.2.2. The Requantification Problem

This subsection discusses a problem that arises for all of the non-movement analyses, both sentence-external and sentence-internal. Our current semantics for [Cond], repeated here, is incompatible with a non-movement analysis.

$$(269) \llbracket [\text{Cond}] \rrbracket = \lambda p_{\langle s, t \rangle} \lambda q_{\langle s, t \rangle} \lambda w \forall s [\text{ClosestSituations}(\min(p))(w)(s) \rightarrow \exists s' [s \leq s' \wedge q(s')]]$$

This is because structure (264) contains an indefinite in the consequent, an indefinite which will once again assert the existence of a unicorn. The result is that (262a) is expected to have a reading in which the unicorn that John kicks is not necessarily the same unicorn whose existence is asserted in the antecedent.

This is the well-known *requantification problem*, so-called because the problem is that we have an indefinite with quantificational force in two places, the antecedent and the consequent, where what we want is for the quantification to take place only in the antecedent. This is a problem that arises in various accounts of similar phenomena, most often in non-movement-based accounts. Von Stechow (1994) notes the problem in his treatment of related generic, adverbially quantified sentences with indefinites, such as (270a), for which a situation-based analysis of generics might, without further modification, predict a reading paraphrased by (270b).

- (270) a. A u usually follows a q.
 b. A situation s_1 which is a minimal one which contains a q and a u is extendible to a situation s_2 in which some u follows some q (but not necessarily the same q and u from s_1).

Von Stechow's solution to the requantification problem is to redefine the conditional operator, so that, informally, it "minimizes" both the antecedent situation and the consequent situation. Formally, the new denotation is (271). The crucial difference between this denotation and (269) is that in (271), the minimization operator is applied to the extended,

consequent situation as well as the antecedent situation. That is, we are asserting that minimal p-situations are extendible to *minimal* q-situations, whereas before we were saying that minimal p-situations were extendible to q-situations simpliciter.

$$(271) \llbracket \llbracket \text{Cond} \rrbracket \rrbracket = \lambda p_{\langle s, t \rangle} \lambda q_{\langle s, t \rangle} \lambda w \forall s [\text{ClosestSituations}(\text{min}(p))(w)(s) \rightarrow \exists s' [s \leq s' \wedge \text{min}(q)(s')]]$$

With this semantics, the paraphrase predicted for (270a) is (272), which is accurate for what the sentence actually means.

(272) A situation s_1 which is a minimal one which contains a q and a u is extendible to a situation s_2 which is a minimal one which contains a u and a q and in which the u follows the q.

Applied to (264), the predicted paraphrase is:

(273) A situation s_1 which is a minimal situation containing a unicorn is extendible to a situation s_2 which is a minimal situation in which John kicks a unicorn.

The fact that the second situation is required to be a *minimal* situation in which John kicks some unicorn guarantees that there will only be one unicorn in that situation, and since the situation is extended from the earlier one, which itself was a minimal situation for a unicorn, the unicorns in the two situations are guaranteed to be the same. The minimization of the second situation in the semantics of [Cond] has much the same effect as the trace conversion in the model defended in the current work. I refer to it as the situation-minimization model.

For the remainder of the chapter, I will assume that the possible theories I am arguing against have something like (271) as a solution to the requantification problem. It is possible, of course, to imagine different solutions. For one thing, it is possible to imagine that something like trace conversion occurs in (264), even though there is no movement. That is, it is possible to imagine that the indefinite article in (264) is converted to a definite article for interpretation, even though the DP is not a copy of movement of the type that would normally trigger that type of conversion process. However, since it is quite unclear how this operation would be constrained in such an analysis, I will not pursue it further here.

However, in actuality problems of overgeneration occur in the situation-minimization model too. This was already noted by von Stechow (1994). If we assume that the conditional operator denotes as in (271), and change nothing about standard assumptions for the semantics of indefinites, then a sentence like (274a) is predicted to have the same meaning as (274b) (with structure (264)).

- (274) a. If a unicorn existed, John would kick a unicorn.
b. John would kick a unicorn.

That is, since we are assuming that the interpreted structure for (274b) contains an antecedent clause with the indefinite *a unicorn* in it anyway, (274a) and (274b) have essentially the same interpreted structure, at least in a context where [Prop] is resolved as the proposition that a unicorn exists. There is nothing in the analysis which makes a distinc-

tion between the phonetically covert nature of the antecedent indefinite in (274a) and the overt indefinite in the antecedent of (274b).

In reality, of course, (274a) has a reading better approximated using the “old” semantics for [Cond] (269), the one which does *not* minimize the second situation. This is because the reading we do get for (274a) is paraphrased more like (275).

(275) A situation s_1 which is a minimal situation for the existence of a unicorn is extendible to a situation s_2 in which John kicks some unicorn, not necessarily the same unicorn from s_1 .

Von Stechow suggests, as a solution to this problem, that we appeal to some form of the “novelty condition” (Heim 1982). The general idea of the novelty condition is that each use of an indefinite noun phrase has to introduce a new discourse referent. The problem with this idea as applied to the situation here is that neither von Stechow’s (1994) theory nor mine makes use of discourse referents in the analysis of indirect binding situations. So it is not clear how such a “novelty condition” should be formulated at all with respect to the current theory.

Notice, for one thing, that, as I mentioned before, the difference between (274a) and (274b) with respect to the analysis we are considering here is solely that (274a) has an overt indefinite noun phrase in the antecedent, while (274b) merely has a propositional pronoun which can resolve to the same assertive content. So any version of the novelty condition which could do any work here would have to refer to the syntactic structure of the antecedent, not merely the semantics of the model as it does in Heim’s (1982) theory. Perhaps the idea would be that the novelty condition applies to indefinite noun phrase if

there is a syntactically identical earlier noun phrase, but the details are far from clear, and I leave it to a defender of this approach to formulate them.

Actually, (274a) entails, or perhaps merely implicates, something stronger than (275), where the second indefinite has to be verified by a *different* unicorn than the one which verifies the first situation. Thus, a paraphrase like (275) would be more accurate to what reading we really get.

(276) A situation s_1 which is a minimal situation for the existence of a unicorn is extendible to a situation s_2 in which John kicks some unicorn, which must be different from the unicorn from s_1 .

This is a case where any analysis may have a need for a type of novelty condition after all. But this is a separate issue from how to formulate the semantics for the conditional.

6.3. Non-Movement Sentence-Internal Analyses

6.3.1. Introduction

Having shown that it is unlikely that a purely sentence-external analysis will work for ICs, it is still possible that there are analyses which could work which are very different from the one defended in this thesis. In this section I will evaluate a general class of such analyses.

If we are abandoning the class of purely sentence-external analyses, we must instead investigate types of analyses of ICs in which the understood antecedent is derived in some way from the content of the sentence. The proposal in this thesis is such an analy-

sis, where in sentence-internal ICs the understood antecedent comes inevitably from a DP within the sentence, via movement.

There are other possibilities, however, both for the part of the clause that is used for the antecedent, and for the process by which this happens. I will focus in this section on an alternative to movement as the process by which a part of the sentence comes to be understood as also being part of the antecedent. I will have little to say about the choice of which phrase this becomes, although my arguments for the movement approach will entail that the moved phrase have certain properties, such as that it must be a constituent.

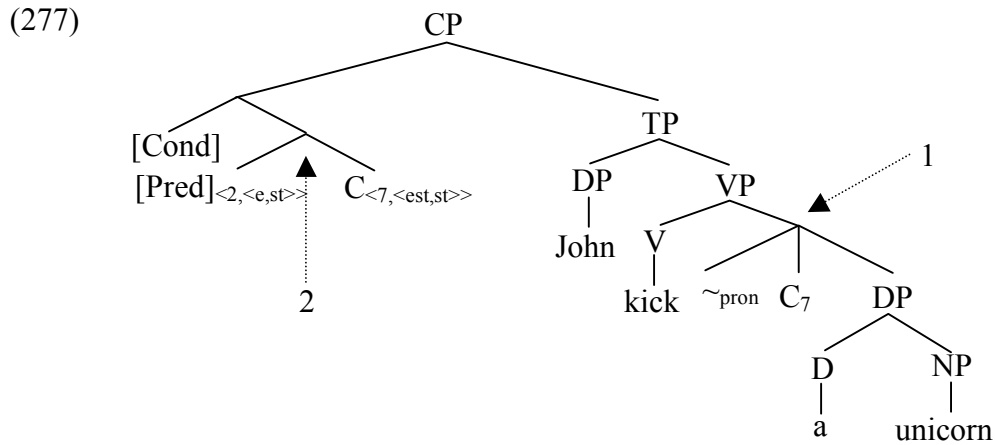
6.3.2. Sentence-Internal ICs By Coindexed Pronouns

A functional alternative to forming the understood antecedent to an IC via movement of a structure from the main clause to the conditional left periphery, is to provide a pronoun in the conditional left periphery that must be coindexed with some structure in the main clause. This can be done in a way similar to Rooth's (1985, 1992) method of applying focus-sensitive operators; indeed, one of the theories we will consider here ties the understood antecedent to the focus semantic value of the clause. However, the procedure will be much more general.

6.3.2.1. Coindexation with DP

We will first investigate the idea that the element which forms the antecedent is the same DP that moves to the conditional left periphery in the analysis defended in the thesis, but that we use the pronoun-coindexation procedure to do it. The basic idea is that we have a

pronoun, dubbed C here after Rooth, in the conditional left periphery, and the same pronoun occurs in the main clause. The pronoun is flexible in its semantic type. The occurrence of C in the main clause is accompanied by the squiggle operator, and both are adjoined to the DP; their only purpose is to constrain the denotation of C_7 to be identical to this DP.



Rooth uses only one \sim operator, which is specifically sensitive to the focus semantic value of the constituent it adjoins to. I will employ two for this explication: one, dubbed \sim_{pron} , for an operator which simply constrains the pronoun next to it to be identical to the ordinary semantic value, and the other, \sim_{foc} , identical to Rooth's operator in constraining its pronoun to be identical to the focus semantic value.

We start with an approach that does not make reference to focus values. Node 1 in (277) will be interpreted via a special rule for the \sim_{pron} operator. The general rule is (278), which constrains a particular index, $\langle n, \tau \rangle$ here, to return the same denotation as the XP that the \sim_{pron} operator is attached to.

$$(278) \llbracket \sim_{\text{pron}} C_{\langle n, \tau \rangle} XP \rrbracket^g = \llbracket XP \rrbracket^g \text{ iff } g(n, \tau) = \llbracket XP \rrbracket^g; \# \text{ otherwise}$$

Thus, node 1 in (277) ends up being interpreted identically to the DP *a unicorn* itself. However, the presence of the \sim_{pron} and C_7 ensures that the instance of C_7 in the conditional left periphery will also be interpreted as identical to the DP *a unicorn*, which in turn leads to the interpretation of node 2 in (277) as the proposition that some unicorn exists (assuming that [Pred], in context, is resolved as the property of existing), which is exactly what we want for the interpretation of (265a). This analysis shall be referred to as the DP pronoun indexing analysis.

The use of the \sim operators, both \sim_{pron} and \sim_{foc} below, involves a slight technical reinterpretation of the way truth conditions work. In the analysis in (277) we are constraining the semantics so that the sentence returns a presupposition failure for most assignment functions, namely all of those assignment functions g' such that $g'(7, \langle \text{est}, \text{st} \rangle)$ is not equal to the generalized quantifier denotation of the noun phrase *a unicorn*. However, this is not an account of any *real* presupposition failures, unlike the use of presuppositions in other parts of the analysis in this thesis. Rather, we want to restrict our attention to assignment functions g such that $g(7, \langle \text{est}, \text{st} \rangle)$ is equal to $\llbracket a \text{ unicorn} \rrbracket$. Within this restricted set of assignment functions, the sentence comes out true when we want it to come out true (when it's the case that if a unicorn existed, John would kick it), and false when we want it to come out false (when it's not the case that if a unicorn existed, John would kick it). Thus, when using \sim operators, we see an analysis as predicting the right truth conditions in general, if and only if it predicts the right truth conditions for those

conditions in general, if and only if it predicts the right truth conditions for those assignment functions for which the sentence is defined, that is, those assignment functions which satisfy the requirements of the \sim operator.

6.3.2.2. Coindexation with Focus Semantic Value

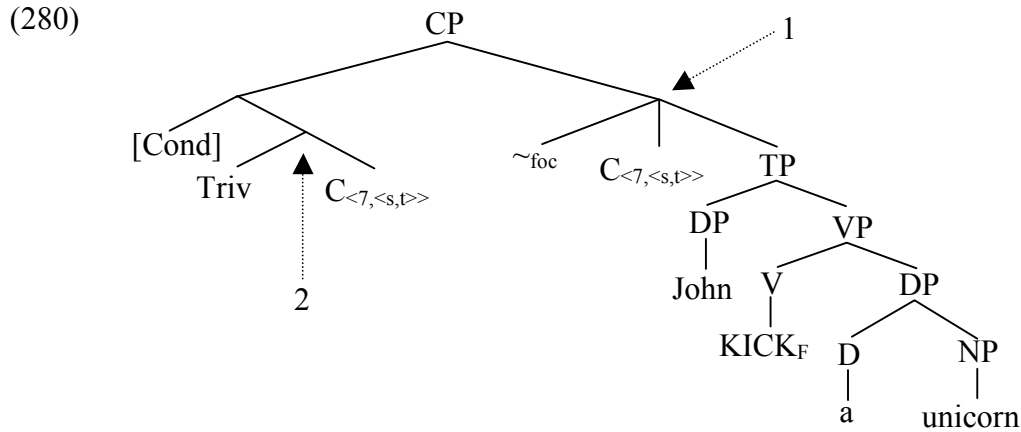
Before we compare this type of analysis with the movement analysis, let us look at another way we could use the coindexation method. This method is more reminiscent of Rooth's original use of the \sim operator, as it takes advantage of the focus semantic value of the expression.

The assumption here is that sentence-internal ICs have a characteristic focus pattern. A good candidate for this pattern is that the focus is always on the verb. A focus intonation on the verb does help bias the listener towards such a reading, especially in the case of non-propositional readings:

(279) John would KICK_F a unicorn.

If this is the case, then we can employ Rooth's theory of focus semantic interpretation to obtain the focus semantic value of the main clause of (279). The structure is now (280); we are going to take the trivialization of the focus semantic value of the entire clause *John kick a unicorn* as the antecedent proposition. The \sim_{foc} operator is the familiar \sim operator from Rooth's work, defined as in (281). It is like the \sim_{pron} operator, but instead of

constraining an index to return the plain semantic value of the XP it is attached to, it constrains the index to return the *focus semantic value* of the XP that it is attached to.



$$(281) \llbracket \sim_{\text{foc}} C_{\langle n, \tau \rangle} XP \rrbracket^g = \llbracket XP \rrbracket^g \text{ iff } g(n, \tau) \subseteq \llbracket XP \rrbracket^F; \# \text{ otherwise}$$

This definition makes use of what is called the *focus semantic value* of a phrase. Rooth's theory of focus semantic value is summarized, and revised slightly in its technical details, as follows.

The focus semantic value of a phrase is a singleton set containing the ordinary semantic value unless the phrase contains one or more elements with *focus features*. Otherwise, any phrase with a focus feature has as its focus semantic value the set of denotations in the domain of its type. If a phrase has focus-marked constituents within it, then the rule for combining focus-marked constituents applies, as in (282c):

- (282) a. $\llbracket X \rrbracket^F = \{\llbracket F \rrbracket\}$, if X is a terminal and has no focus feature.
 b. $\llbracket X_F \rrbracket^F = D_\tau$, where τ is the type of X , if X has a focus feature.
 c. $\llbracket X Y \rrbracket^F = \text{FA}(\llbracket X \rrbracket^F \times \llbracket Y \rrbracket^F)$, where $\llbracket X \rrbracket^F \times \llbracket Y \rrbracket^F$ is the Cartesian product of the focus interpretations of X and Y , and FA (for function application) ranges over a set of pairs and applies the first member of each pair to the second, or applies the second member of each pair to the first — whatever is type-theoretically sound.

Step (282a) says that if a head X has no focus-marked constituents, its focus interpretation consists of the singleton set containing its ordinary semantic interpretation. Step (282b) says that if a head X is itself focus-marked, then its focus semantic value consists of the set of possible denotations of the same type as the ordinary semantic value of X .

(282c) says that if we combine two constituents X and Y (whether they are heads or phrases), we look at the focus interpretations of each phrase, $\llbracket X \rrbracket^F$ and $\llbracket Y \rrbracket^F$. Each of these is a set, possibly a singleton. Then the focus interpretation of the combined phrase is the set containing the results of combining any member of $\llbracket X \rrbracket^F$ with a member of $\llbracket Y \rrbracket^F$, and running function application in the proper direction.

The \sim_{foc} operator imposes the presupposition that the pronoun attached to it must denote a subset of the focus semantic value of the phrase that it is attached to. Unlike the implementation of the analysis via coindexation with the ordinary semantic value, here, for the purposes of analyzing ICs, we always attach the \sim_{foc} operator to a constituent of proposition-type, $\langle s, t \rangle$. Therefore the focus semantic value of TP in (280) is a set of propositions, namely the set that varies according to the identity of the verb. Informally, it is a set of propositions of the form “John R a unicorn”, with R varying among two-place relations. $C_{\langle 7, \langle s, t \rangle \rangle}$, then, is constrained to be a subset of that set of propositions. (It will be a proper subset to the extent that some of the possible two-place relations we could substi-

tute for R are contextually not entertained. For example, if the verb is *kick*, it may be only physical actions that are included as substitutions for R.)

However, we don't want a set of propositions as the argument to [Cond]; rather, we want a single proposition. And the proposition we want, intuitively, is the proposition that John does *something* to a unicorn. That way, the paraphrase we will get for (279) is roughly that in (283).

(283) If John were to do something to a unicorn, John would kick a unicorn.

(283) is logically fairly close to (265b), given certain assumptions, and remembering that we are using something like the situation-minimization model to take care of the requantification issue in (283). The way we derive this proposition for the argument of [Cond] (node 2 in (280)) is to exploit the trivialization operator *Triv*, which derives the trivialization of the focus value. The trivialization operator takes a set of propositions and returns the disjunction of all of those propositions. Viewing propositions as sets of worlds, the trivialization of a set of propositions can be viewed as the grand union of the set. However, I give here a formal definition, one which is not dependent on the view of a proposition as a set of worlds, since, as seen earlier, some propositions in our model have presuppositions (since they are partial functions from worlds to truth values) and hence cannot be viewed simply as sets of worlds.

(284) $\llbracket \text{Triv } C_{\langle n, \langle s, t \rangle \rangle} \rrbracket^g$, where $g(n, \langle s, t \rangle)$ is a set of propositions, $= \lambda s \exists p_{\langle s, t \rangle} p \in g(n, \langle s, t \rangle) \wedge p(s)$

(284) defines the trivialization operator *Triv* as taking a set of propositions and returning the proposition that some proposition in that set is true. Applying (284) to the case where $g(7)$ is a subset of the set of propositions of the form “John R a unicorn”, we have the proposition that some proposition in that set is true; which entails that John did “one of the R’s” to a unicorn.

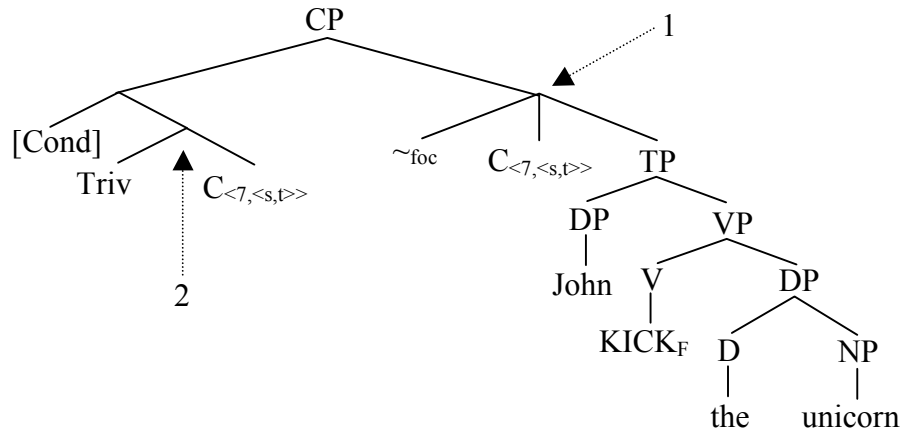
One more note on the adequacy of the analysis by coindexation with focus is warranted, before we turn to its shortcomings as compared to the movement analysis. This note concerns the fact that the focus analysis can handle the properties of ICs with definite articles, that is, the fact that they *do not* have sentence-internal readings, just as the movement analysis can, though it is unclear whether it is as conceptually appealing. This is done as follows.

Suppose we are going to analyze (285), assuming it has the focus marking given.

(285) John would KICK_F the unicorn.

If we apply the same procedure that we used for (279), then we will have (286) as the structure.

(286)



So $C_{\langle 7, \langle s, t \rangle \rangle}$ will end up once again denoting a subset of the focus semantic value of TP. And the focus semantic value of TP is the set of propositions informally of the form “John R the unicorn”. But notice that our informal form for the propositions includes the definite DP *the unicorn*. This means that each of the propositions in the focus semantic value of TP should have the same presupposition, namely the presupposition contributed by *the unicorn*, that there exists a unique unicorn.

If each member of the focus value has a presupposition, then what, if any, presuppositions should the trivialization of the focus value have? It seems reasonable that the trivialization should inherit any presuppositions that the members of the set have. Since in this case, all the members of the set have the same presupposition, it is trivial to see that that is the same presupposition that the trivialization will have, but I will give a slightly more general definition:

(287) $[[\text{Triv } C_{\langle n, \langle s, t \rangle \rangle}]^g]$, where $g(n, \langle s, t \rangle)$ is a set of propositions, $= \lambda s \#$ iff $\exists p_{\langle s, t \rangle} [p \in g(n, \langle s, t \rangle) \wedge p(s) = \#]$; 1 iff not $\# \wedge \exists p_{\langle s, t \rangle} p \in g(n, \langle s, t \rangle) \wedge p(s)$; 0 otherwise.

Definition (287) says that the trivialization of a set of propositions C is a function from situations s to truth values, which yields presupposition failure if any of the propositions within C would have yielded presupposition failure if applied to s . Otherwise, the trivialization is true with respect to s if any of the propositions in C is true of s .

We could have also have defined the presupposition such that only if *all* the propositions in the set yield presupposition failure would the trivialization do so. In the case we are looking at, all of the propositions in the set have the same presuppositions, so it doesn't matter which type of projection we choose. I leave it to further research to pursue the question of which type of projection would be right.

6.4. Against Non-Movement Analyses

There are several disadvantages of the analyses of what I have been calling “sentence-internal” readings of ICs as not involving movement. I have already outlined the main disadvantages of the analysis which does not include any sentence-internal method of forming the antecedent in such examples (section 6.2). But there are some shortcomings of any analysis of the relevant readings which do not involve movement, at least as those analyses now stand. In this section I show some of these disadvantages.

6.4.1. Propositional Readings

One transparent disadvantage of non-movement analyses is that there is no obvious way to replicate the results in chapter 5 involving propositional readings of indefinites and other clauses. In section 5.2 I motivate a series of constraints on the interaction between

movement into the conditional left periphery and the placement of the [Pred] element to derive propositional readings. Those constraints are repeated here from section 5.2.

- (288) a. A quantificational DP must move at LF from its argument position, either sideward or upward.
- b. An unmoved copy of a moved DP whose leftmost element is a determiner must undergo trace conversion. An unmoved copy of a DP whose leftmost element is not its determiner may not undergo trace conversion.
- c. When a DP undergoes upward movement, the lower copy must undergo trace conversion (in order to create an operator-variable dependency). This combined with assumption (d) prevents a DP from moving along with [Pred] when moving upward.

It is unclear how these constraints could be stated in a non-movement analysis. For example, in place of (288a) we would want some constraint which relates the ability to attach [Pred] to the DP with the choice of whether to coindex a pronoun with part of the sentence as in section 6.3.2. This type of constraint would be extremely nonlocal, especially when compared to (288a), which can be implemented with a simple featural specification.

(288b) presupposes the process of trace conversion, which is absent from non-movement analyses. In its place we have the situation-minimization model, which is entirely located in the denotation of the [Cond] operator. In order to allow requantification, as we want to for propositional readings, we will have to introduce two different [Cond] operators, one with the semantics in (269) and the other with (271). Having such an ambiguity is undesirable as it is, but the analog to constraint (288b) would involve another nonlocal dependency, a dependency between the choice of [Cond] operator and the pres-

ence of [Pred]. This contrasts with the locality of (288b) itself in the movement analysis, where we only have to look within the DP to see whether we can trace-convert or not.

It is likewise hard to imagine a non-movement analog to (288c). The constraint is necessary to prevent propositional readings in non-ICs or in non-sentence-internal readings of ICs. The problem would presumably be solved by whatever the analog is to constraint (288a), but it suffers from the same lack of locality.

6.4.2. Constraints on Multiple Sources of Antecedents in Sentence-Internal ICs

A type of case that we haven't discussed yet is the situation when we have multiple DPs in an IC, each of which could serve to form part of the restrictor. In these cases, the movement analysis makes better predictions than any of the non-movement analyses of ICs that we have discussed so far, although the judgments are sometimes difficult.

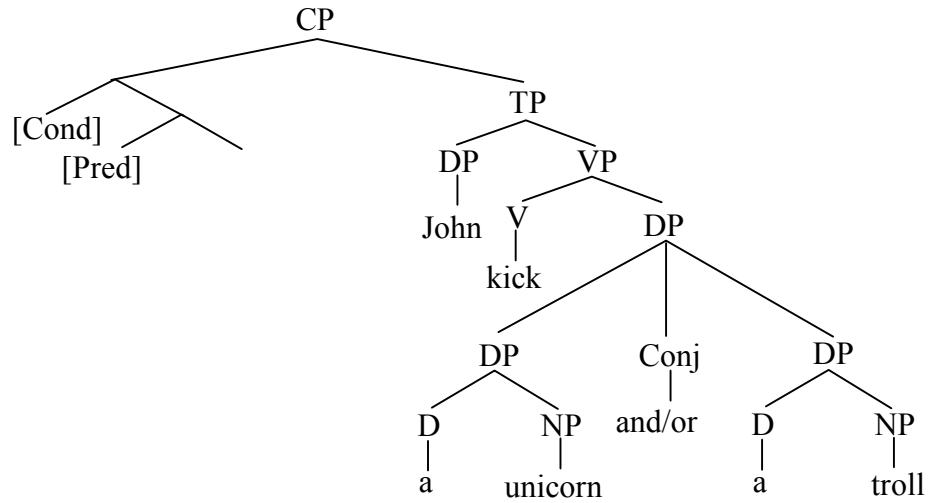
6.4.2.1. Coordination

Let us consider ICs with coordinations of two DPs.

- (289) a. John would kick a unicorn or a troll.
b. John would kick a unicorn and a troll.

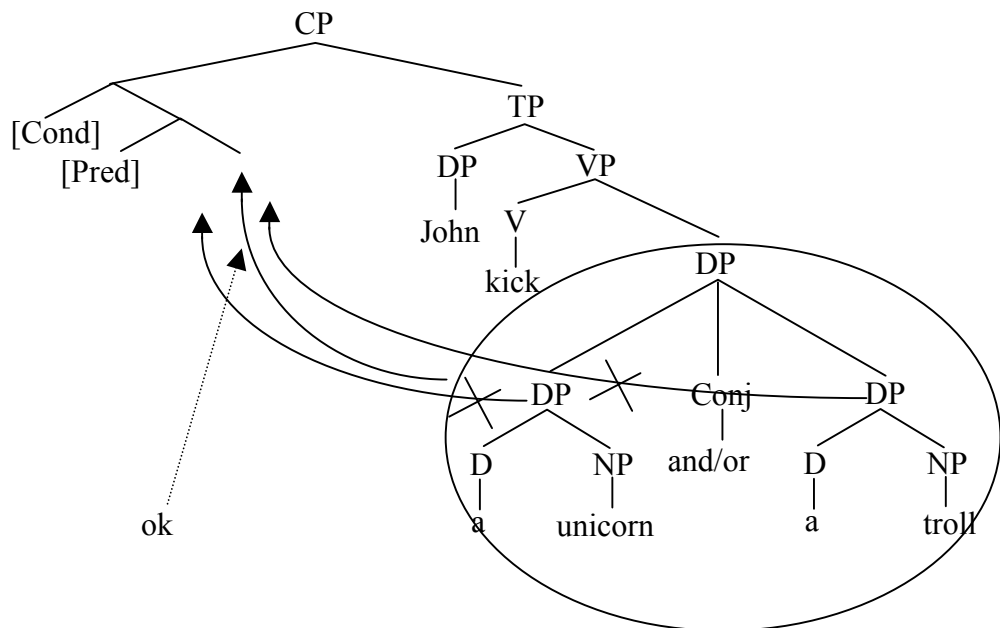
Let us first look at what the movement analysis predicts for such cases. The structure we start out with is (290).

(290)



Assuming that movement to the conditional left periphery will obey some form of the coordinate structure constraint, in (290) we can move the entire coordinated DP, or move nothing, but we cannot move just one of the conjuncts.

(291)



This translates to a prediction that we should be able to get a fully sentence-external reading for (289), or a sentence-internal reading where the entire coordinated DP forms the restrictor, but not a reading where only one of the conjuncts forms part of the restrictor and the other does not. In other words, we predict, with letters matching, (292) (in a certain discourse context where fantasy worlds are under discussion) and (293) as possible paraphrases for (289), but not (294).

- (292) a. If John were in a fantasy world, he would kick a unicorn and a troll.
b. If John were in a fantasy world, he would kick a unicorn or a troll.

- (293) a. If a unicorn and a troll existed, John would kick the troll and the unicorn.
b. If a unicorn or a troll existed, John would kick the troll or the unicorn (whichever it was that existed).

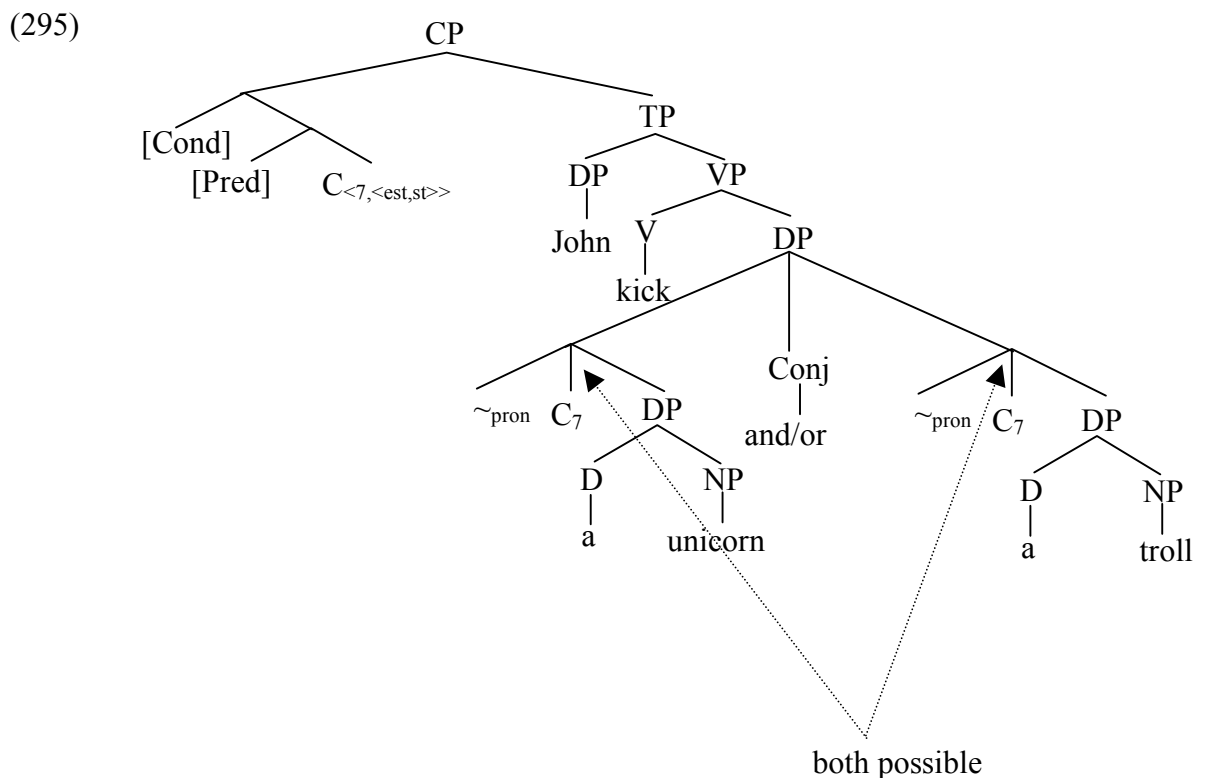
- (294) a. If a unicorn existed, John would kick the unicorn and a troll. # = (289a)
b. If a unicorn existed, John would kick (either) the unicorn or a troll. # = (289b)

Determining whether these predictions are actually met is a bit difficult, and we will provide clearer examples below, though in my judgment the predictions of the movement analysis can already be seen to be correct. For now, however, let us see what the predictions of the non-movement analyses are for the same example.

6.4.2.2. Predictions of the Coindexation-With-DP Analysis

We will focus our attention here on the non-movement sentence-internal analyses, since the faulty predictions of the purely sentence-external analysis have already been discussed at length in section 6.2. The coindexation-with-DP analysis, predicts that all of

the paraphrases in (292-294) should be possible paraphrases for (289), since the former has no potential locus for constraints on how the coindexation should take place. The predictions of the coindexation-with-focus analysis are not as obvious, and require more subtle examples to tease them apart from the predictions of the movement analysis. We look at the coindexation-with-DP analysis first.



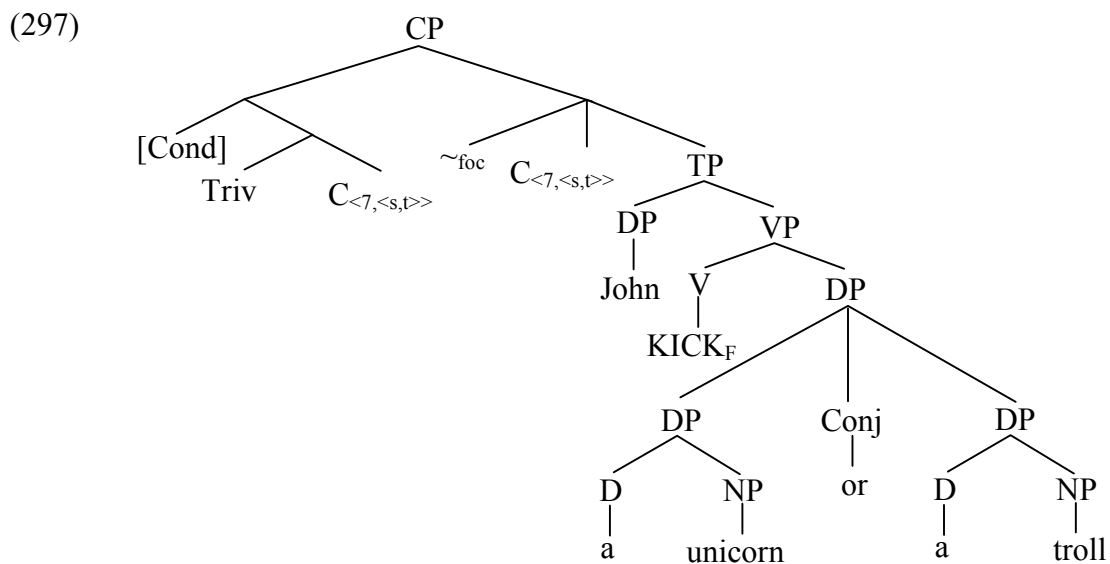
As we can see in (295), on the coindexation-with-DP analysis we can attach a pronoun to either DP, and coindex the pronoun attached to [Pred] with it. This predicts paraphrases such as (294) to be possible. Since this analysis does not involve movement, or any other operation that is subject to constraints such as the coordinate structure constraint, there is

no obvious way to build in a constraint against this type of coindexation. Binding of pronouns does not normally obey any such constraint:

- (296) a. Every boy₁ knows that he₁ and Sarah will pass the test.
 b. Every boy₁ knows that Sarah and he₁ will pass the test.

6.4.2.3. Predictions of the Coindexation-With-Focus Analysis

The predictions of the coindexation-with-focus analysis with respect to coordination are not always clear, and they depend somewhat on our assumptions about what collection of elements in the structure can be focused. Let us first look at the starting structure and start with our assumption from before, that it is the verb that is focused in sentence-internal readings. We will focus on disjunction, since that will eventually allow us to discover a difference in predictions between the focus analysis and the movement analysis. Conjunction, however, would work in a parallel manner.



If we assume, once again, that it is the verb that we will focus, then [Triv C_{<7,<s,t>>}] will end up denoting something like (298a), abstracting over the effect of local upward QR of the conjoined DP, paraphrased as in (298b). This means that (297) as a whole will denote (299a), paraphrased loosely in (299b) (with the situation-minimization rule for the [Cond] operator allowing the paraphrase to reflect an anaphoric dependency between the two “trolls or unicorns”).

- (298) a. $\lambda s \exists R_{\langle e, \langle e, \langle s, t \rangle \rangle \rangle} \llbracket \text{a unicorn and a troll} \rrbracket (\lambda x [R(\text{John})(x)])$
 b. There exists some (salient) relation such that that relation is true of John and something which is either a troll or a unicorn.

- (299) a. $\llbracket \llbracket \text{Cond} \rrbracket \rrbracket (\lambda s \exists R_{\langle e, \langle e, \langle s, t \rangle \rangle \rangle} \llbracket \text{a unicorn and a troll} \rrbracket (\lambda x [R(\text{John})(x)])) (\llbracket \llbracket \text{a unicorn and a troll} \rrbracket (\lambda x [\llbracket \text{kick} \rrbracket (\text{John})(x)])$
 b. If there existed some (salient) relation that held between John and some thing which was a unicorn or a troll, then John would kick that thing.

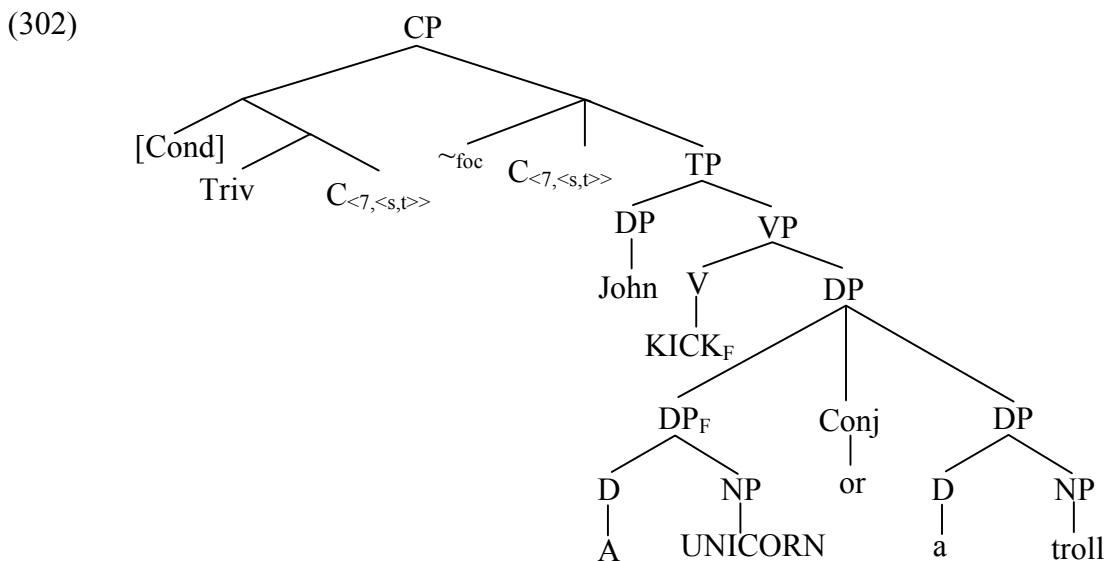
(299b) as a paraphrase for (297) may not seem identical, and not as good as the paraphrases suggested by the movement analysis, but I think it is reasonably synonymous. Therefore we can say that the focus analysis generates the correct reading for conjunctions of two indefinite noun phrases in ICs. Next we must check whether it generates any incorrect readings.

The incorrect readings we are interested in, again, are readings which on the movement analysis would have to violate the coordinate structure constraint, such as (300c) or (300b) as paraphrases for (300a).

- (300) a. John would kick a troll or a unicorn.
 b. If a troll existed, John would kick either that troll or some unicorn.
 c. If a unicorn existed, John would kick either that that troll or some unicorn.

If we assume that focus in ICs is always on the verb, then there is no way to generate the incorrect readings in (300). However, if we focus the verb and just one of the indefinites, leaving the other unfocused, then we will generate one of the unwanted readings in (300). For example, the structure in (302) generates the equivalent of reading (300b), though the focus-analysis paraphrase is more like (301).

- (301) If John were to do something to a troll and something else, he would kick either that troll or some unicorn.



This, of course, is an unwelcome prediction of the focus analysis.

The reason why (302) gives the reading (301) is because, quite generally, if a node X contains the focused constituents Y_F and Z_F , then the focus semantic value of X,

$\llbracket X \rrbracket^F$, is the same as if Y and Z were not focused but some constituent containing exclusively Y and Z, W_F , was focused, even if Y and Z do not in fact form a constituent. To see this, let us investigate the interpretations of the expressions in (303), where each constituent is labeled with its type; this is for expository purposes and should not be confused with the standard subscripts for indexing of pronouns and quantifiers.

$$(303) \text{ a. } \llbracket [W_{\tau_3} V_{\langle \tau_2, \tau_3 \rangle} [X_{F\tau_2} Y_{\langle \tau_1, \tau_2 \rangle} Z_{\tau_1}]] \rrbracket^F = \{S \in D_{\tau_3} : S = \llbracket V \rrbracket(R), \text{ where } R \in D_{\tau_2}\}$$

$$\text{ b. } \llbracket [W_{\tau_3} V_{\langle \tau_2, \tau_3 \rangle} [X_{\tau_2} Y_{F\langle \tau_1, \tau_2 \rangle} Z_{F\tau_1}]] \rrbracket^F = \{\llbracket V \rrbracket\} \times [D_{\langle \tau_1, \tau_2 \rangle} \times D_{\tau_1}] =$$

$$\{\llbracket V \rrbracket\} \times D_{\tau_2} = \{S \in D_{\tau_3} : S = \llbracket V \rrbracket(R), \text{ where } R \in D_{\tau_2}\}$$

(303a) expresses what happens when a single constituent X is focused. In that case, the focus value of that constituent is the set of denotations in the domain of the semantic type of that constituent, X. (303b) shows what happens when we have a structure identical to that in (303a) except that instead of X being focused, both of its daughters Y and Z are. In that case, the focus values of Y and Z are the sets of denotations in the domains of their respective types. But the focus value of their containing node, X, ends up being the same, the domain of denotations in the type of X, because of the way that focus values are compositionally computed.

6.4.3. Multiple Indefinite Arguments

This section discusses ICs which have multiple indefinites in different argument positions. The pairs of indefinites therefore do not form constituents, in contrast to the last section which discussed cases where, being coordinated, the pairs of indefinites, together with the conjunction, formed constituent DPs. This difference leads to rather different

predictions of the two analyses with respect to which indefinites can form parts of the understood antecedent to the conditional.

We examine two cases of ICs, both involving two indefinite DPs as arguments. The first case, discussed in section 6.4.3.1, is the case of a subject and an object indefinite. The second, in section 6.4.3.2 is the case of a double object construction, where both of the objects are indefinites. In both cases the main point will be the same: the focus analysis predicts sentence-internal readings to be possible for the ICs where both of the indefinites find their way into the understood antecedent. In contrast, the movement analysis provides a way to impose a constraint which will only allow one indefinite at a time to get into the understood antecedent. As the reader may surmise, I will argue that the predictions of the movement analysis are correct, and the predictions of the focus analysis fall short. The judgments in this case are much more clear in the double object case, but still suggestive in the subject/object case.

6.4.3.1. Subject and Object Indefinites in ICs

In this section we investigate the predictions of the movement analysis and of the focus analysis for ICs with two indefinites, as well as investigating the judgments of such examples. The canonical examples are as in (304), where (304a) is the type where the most likely understood predicate to go in the conditional left periphery is the property of existence, and where in (304b) the most likely property is more like the property of encountering a certain individual.

- (304) a. A troll would eat a unicorn.
b. A bachelor would dance with a debutante.

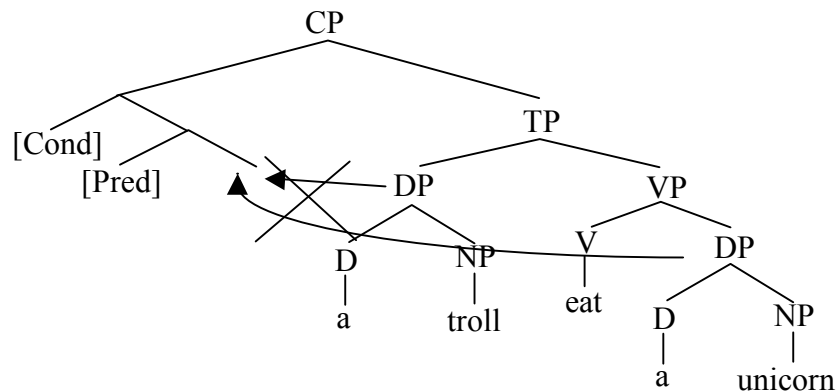
Let us now display the full range of paraphrases whose possibility as equivalents for (304) is in question, unjudged for now. Again, these are the paraphrases suggested by the movement analysis, but equivalent paraphrases exist for the focus analysis which will be discussed below when we discuss the predictions of that analysis.

- (305) a. If a unicorn existed, a troll would eat it.
b. If a troll existed, it would eat a unicorn.
c. If a troll and a unicorn existed, the troll would eat the unicorn.
- (306) a. If a debutante was in the relevant situation (say, at the debutante ball), a bachelor would dance with her.
b. If a bachelor was in the relevant situation (say, at the debutante ball), he would dance with a debutante.
c. If a bachelor encountered a debutante (say, at the debutante ball), the bachelor would dance with the debutante.

That is, the question is whether both indefinites can form part of the antecedent, or just one can.

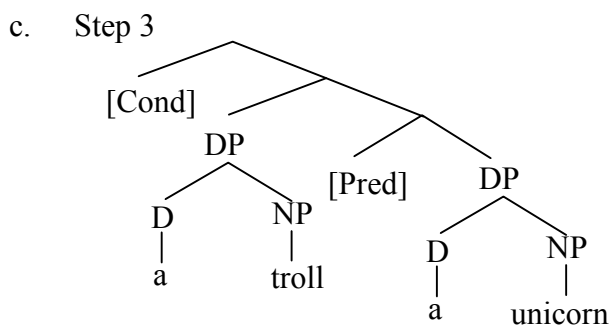
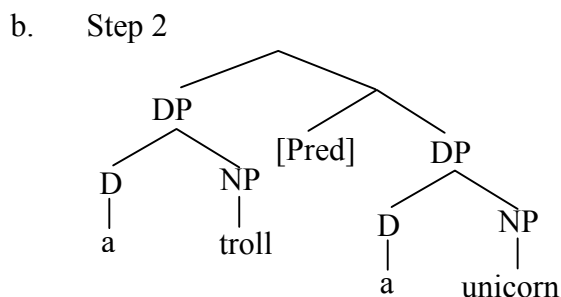
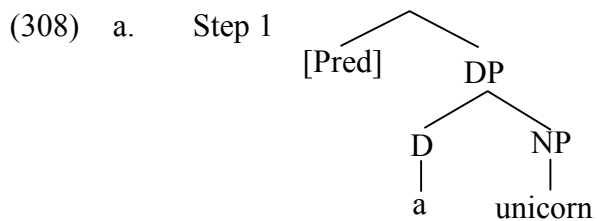
The movement analysis predicts, certainly, that the reading where only one of the indefinites forms part of the antecedent, such as the (a-b) readings above, should be possible. For these readings, one or the other of the indefinites moves to the conditional left periphery. As for the readings where both indefinites form part of the antecedent, as in the (a) readings above, further assumptions are needed to determine what the movement analysis predicts. Let us take a look at the structure that the movement analysis, at least as presented so far, assumes.

(307)



If this is all there is, then we can only move one of the DPs to the sister position of [Pred]. Standard syntactic assumptions do not allow any way for both of them to get there, since unlike in the case of conjunctions, there is no DP constituent that contains both of them. This means that at present, the analysis predicts that the (a) and (b) readings in (305) and (306) should be possible readings of (304), but not the (c) readings.

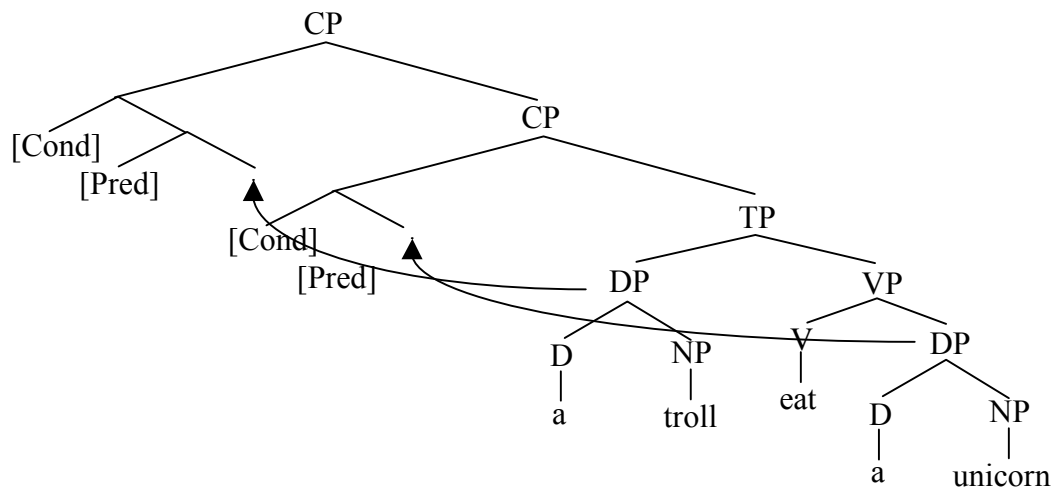
There are of course possible derivations which could get both DPs into the conditional left periphery, but they will either violate syntactic constraints or be semantically ill-formed. For example, we could move one of the DPs to the complement position of [Pred], then adjoin the other DP to the resulting structure before merging the whole thing with [Cond].



The problem with these derivations can be stated in two ways. For one, we can simply stipulate that there are no syntactic features which would allow the second DP to move sideward to adjoin to the constituent created by [Pred] and the first DP. This, however, goes hand in hand with the second problem, that the object in (308b) does not receive a well-formed semantic denotation. The DP is of type $\langle \text{est}, \text{st} \rangle$, while the constituent [[Pred] DP] is of type $\langle \text{s}, \text{t} \rangle$, already a proposition. There is no obvious way to get it into a proposition that involves both the DPs in a well-formed way. Therefore, there is no semantically meaningful way to get both DPs into the conditional left periphery.

This does not necessarily mean that the movement analysis cannot be modified so as to allow the (c) readings. One fairly straightforward way to do it is to allow a single clause to contain multiple conditional left peripheries, one for each of the indefinites to move into.

(309)

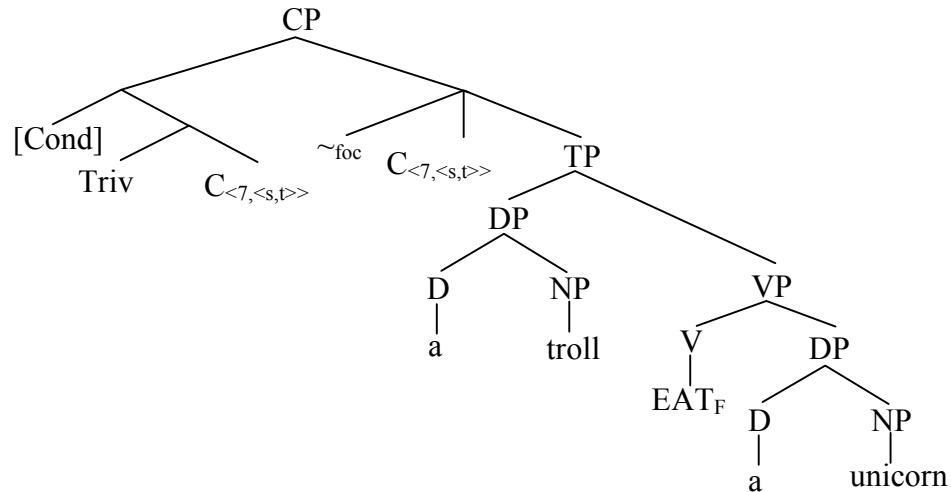


If a structure like (309) were to be possible, then the paraphrase it suggested would involve two conditionals, as in (310), but the truth conditions of such an analysis are the same as (305c).

(310) If a troll existed, then if a unicorn existed, the troll would eat the unicorn.

Now let us look at what the focus analysis predicts.

(311)



In (311), all we have to do is focus only the verb and neither of the DPs, and we predict something like the (305c) paraphrase, because it would be read as something like (312).

(312) If a troll were to bear some relation (one of the contextually salient ones) to a unicorn, the troll would bear the eating-relation to the unicorn.

In order to predict the (a) and (b) readings, we would focus *a troll* or *a unicorn* respectively.

So the predictions of the two analyses are as follows. On the one hand, the focus analysis automatically allows all three of the readings in (305) and (306) for (304). It is not clear how the focus analysis could even be modified so as to exclude any of the readings. On the other hand, the movement analysis, in its canonical form, excludes the (c) readings in (305) and (306) for (304), but allows the (a) and (b) readings. It would be fairly straightforward to modify the movement analysis so as to allow the (c) readings, but also straightforward to continue to exclude them.

In my judgment, the movement analysis is right: the (c) readings do not exist for (304). This is difficult to judge one way or another, because the differences in truth conditions are subtle. So let us look at them carefully, continuing with the troll-and-unicorn example.

(313) A troll would eat a unicorn.

- (314) a. If a unicorn existed, a troll would eat it.
b. If a troll existed, it would eat a unicorn.
c. If a troll and a unicorn existed, the troll would eat the unicorn.

In order for (314c) to be a viable reading for (313), it would have to be utterable in a context where both unicorns and trolls are assumed not to exist, and furthermore a context where there is no hypothetical world being set up where unicorns in general, or trolls in general, might exist. My claim here, that (314c) is not a viable reading for (313), may not seem to be apparently true; I claim that that is because one of the *possible* readings, readings (314a-b), is masquerading as reading (314c) because the context hasn't been carefully set up.

For example, reading (314b) says that if a troll existed, then there would exist a unicorn which the troll would eat. Reading (314a) says that if a unicorn existed, a troll would exist that would eat the unicorn. Neither reading requires that in the actual world, either trolls or unicorns exist. Indeed, the only requirement is that for (314b), trolls do not exist in the actual world, and for (314a), unicorns do not.

By contrast, (314c) requires that there be neither unicorns nor trolls in the actual world. But this requirement doesn't help us devise a test for whether reading (314c) is available, because any context where reading (314c) is viable, that is contexts where neither unicorns nor trolls exists, are also contexts where unicorns don't exist and where trolls don't exist.

So we have to focus on the differences in the truth conditions themselves. Let us start with the difference between (314a) and (314b). The difference is, essentially, that (314a) expresses a general, trans-possible-world property about unicorns, while (314b) expresses a trans-possible-world property about trolls. In (314a), trolls are an elaboration of the explanation of what unicorns would be like, while in (314b) unicorns are an elaboration of what trolls would be like. I find (313) to be fine with each of these readings, possibly with an intonation difference between the two. But then, (314c) is trying to express a general, trans-world property about both trolls and unicorns simultaneously. It is this latter option that seems to be unavailable for (313).

The example with trolls and unicorns does suffer from a defect, however: it is quite plausible to a listener that a world where unicorns exist is a world where trolls exist, and vice versa. This means that the available readings (314a) and (314b) don't seem that different from what I claim is the unavailable reading, (314c); both take us to worlds where both unicorns and trolls exist.

A different example may help here. This example will juxtapose two hypothetical things from rather different fields.

(315) A troll would protest a war.

Suppose a context for (315) where there is currently no relevant war. As silly as (315) sounds on any reading, I think it can be understood as asserting either that if a war occurred, a troll (wherever it came from) would protest it. Now assuming that there are in fact several wars in the actual world, I think (315) can be understood as asserting that if a troll existed, it would protest one of these wars.

But now suppose that there are neither trolls nor wars in the current context. We then try to (315) to be understood as saying that if there were trolls and wars, then trolls are the sort of thing that would protest wars. This seems more clearly unavailable.

So the conclusion here is that when a subject and an object indefinite occur together in an IC, there is no reading available which corresponds to a semantic structure where both indefinites form part of the semantic antecedent. This has consequences for both the movement analysis and the focus analysis; each has to say something to rule out putting two indefinites into the antecedent in its own way. The movement analysis, however, can impose such a restriction much more straightforwardly, and in a principled way: we simply claim that there is no possibility of a structure like (309), where we have two conditional left peripheries. This restriction is easily obtained simply by limiting the selection features of the syntactic heads involved, so that only one [Cond] and [Pred] element may be merged in a given clause. For example, perhaps [Cond] has a feature such that it is merged with the constituent consisting of [Pred] plus a DP, and the resulting constituent must merge with a TP, but the CP thus formed cannot be merged with a further [Cond]

and [Pred] complex. In addition, the movements required in (309) may be found to violate some syntactic constraints, such as some formulations of Shortest Move. By contrast, it is unclear how the focus analysis could be modified to prevent a structure where two indefinites find their way into the antecedent. So for these reasons I take the judgments, when considered carefully, to support the movement analysis of sentence-internal readings of ICs over the focus analysis.

6.4.3.2. Double Object Indefinites in ICs

This section discusses the case of double object and double complement structures in ICs, where both objects are indefinites. The goal is the same as in the last section: to determine which readings are available among the logically possible sentence-internal ones, and to determine which analysis, the movement analysis or the focus analysis, predicts the correct judgments in the most straightforward way.

The results will end up being the same as the case of subject and object indefinites. That is, the judgments will come down on the side of allowing only one indefinite at a time to form part of the understood antecedent, and the movement analysis can capture this pattern more easily than the focus analysis can. The difference is that the data are much clearer in the double object case.

Here is the canonical data. Again, we will include one fantastic situation, so that the salient hypothetical predicate will be existence, and one more realistic situation. For (316a), understand for *a panacea* a hypothetical cure-all, a medicine that could cure any disease. For (316b), assume again a debutante ball, with multiple debutantes, where Mary is a so-

cialite of some importance who knows both most of the bachelors and most of the debutantes.

- (316) a. John would give a sick unicorn a panacea.
b. Mary would introduce a bachelor to a debutante.

- (317) a. If there were a sick unicorn, John would give it a panacea.
b. If a panacea existed, John would give it to some sick unicorn.
c. If a sick unicorn existed and a panacea existed, John would give the panacea to the sick unicorn.

- (318) a. If Mary encountered a debutante, she would find a bachelor and introduce the two.
b. If Mary encountered a bachelor, she would find a debutante and introduce the two.
c. If Mary encountered a debutante and a bachelor, she would introduce the two.

Again, I think that (316) has the (a) and (b) readings in (317) and (318) but not the (c) readings. The judgments here seem clearer than in the subject/object case, but let us take a look. Again, in order for (316a) to have reading (317c), we have to imagine that we are saying something about both hypothetical unicorns and panaceas simultaneously. This seems unlikely; (316a), possibly depending on its intonation, can be saying something about sick unicorns (namely that John would give one a panacea) or about panaceas (namely that John would give one to a sick unicorn), but not both. For (316b) to be read as (318c), it would have to be saying that if Mary encountered a bachelor and a debutante, she would introduce the one to the other: a plausible situation, but it cannot be expressed by (316b).

Once again, another example may make the point more clearly. Let us continue with the juxtaposition method, by posing two entities that are hypothetical in two different ways.

- (319) a. John would show a unicorn a war.
- b. John would give a troll a debutante. (presumably with gruesome consequences)

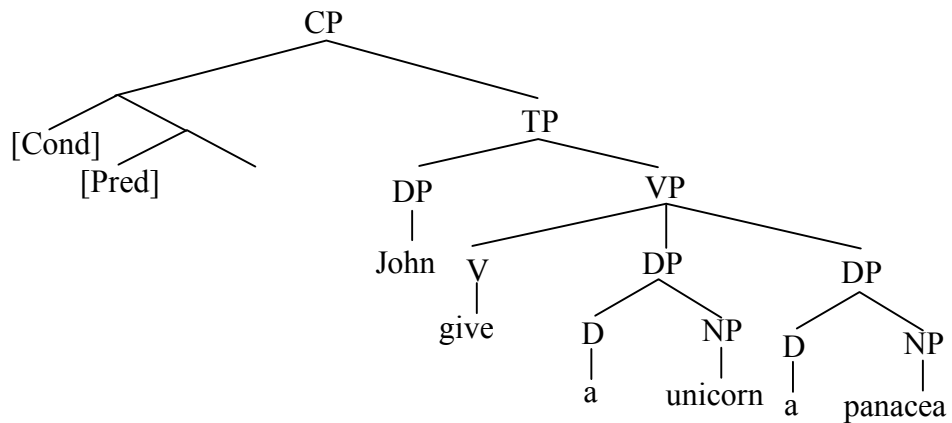
(319a) can be read as saying that if a unicorn existed, John would find some war to show it. It can also be read, with a rather marked intonation, as saying that if war broke out, John would find some unicorn to show the war to. But it can't be read as saying that if a unicorn existed *and* war broke out, John would show the unicorn the war.

(319b) goes the same way. It can be read either as saying that if a troll existed, John would give a debutante to it, or as saying that if John encountered a debutante, he would give her to a troll. But it can't be read as saying that if a troll existed and John encountered a debutante, John would give the debutante to the troll.

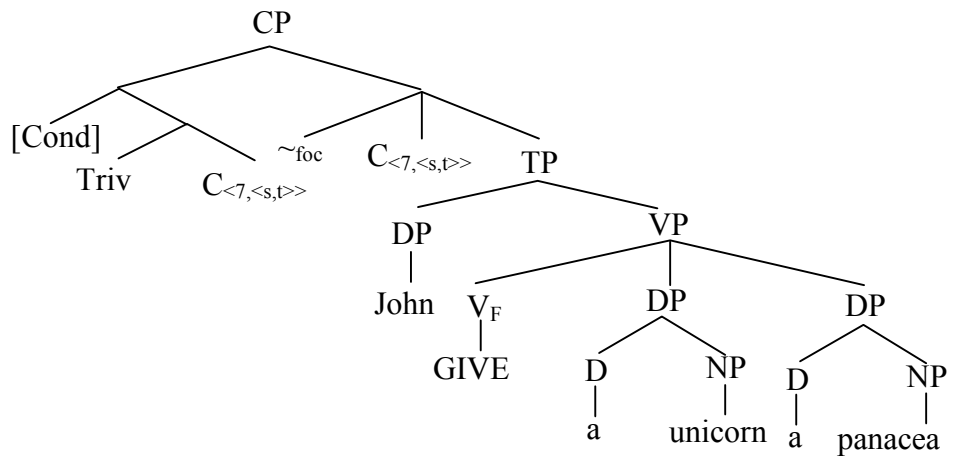
Thus, the judgments once again come on the side of only allowing one of two indefinites within the IC (if they are not part of a conjunction and constitute separate arguments) to form part of the understood antecedent at a time. Once again, this is far easier to capture with the movement analysis than with the focus analysis, since the focus analysis by default predicts that we should be able to get the reading where both indefinites are interpreted within the antecedent; one would simply focus the verb.

The structures involved are (320) for the movement analysis and (321) for the focus analysis.

(320)



(321)



I give the structure for the double object here as a flat ternary branching structure, but this is just for ease of explanation. I don't commit to any particular analysis of the double object structure, nor do I need to to make my point. The only assumption I need to make here is that the two objects do not form a constituent which is a DP and has a generalized quantifier meaning; this seems uncontroversial on any analysis, whether it be the ternary branching analysis where the DPs don't form a constituent at all, or a variant of the VP-

shell analysis where any constituent containing both DPs would also contain a verbal head of some sort and hence would be a phrase with a verbal category.

So, with this assumption in place, there is no way to get both indefinites into the sister position of [Pred] in (320), at least not without adding another conditional left periphery, which we can simply assume is syntactically not available. Since you'd need to move both indefinites in order to predict reading (317c) for (316), and since we do not in fact observe reading (317c) for (316), I take this to be a good result of the movement analysis. The analysis does however predict that you can move either *one* of the DPs in (320), and this results in either reading (317a) or (317b).

The structure in (321), however, straightforwardly allows both indefinites to become part of the antecedent. This is because only the verb is focused, and so the trivialization of the focus value of the TP becomes, loosely, the proposition that some trivalent relation holds between John, some unicorn, and some panacea. This trivialization then becomes the antecedent, and we have the unwanted meaning, the paraphrase being something like (322).

(322) If John were to bear some relation to some unicorn and some panacea, he would bear the giving-relation to the unicorn and the panacea.

(322) has essentially the same truth conditions as (317c), which is not in fact a possible reading for (316). So I take this to be an argument for the movement analysis and against the focus analysis.

6.5. Conclusion

This section has been concerned with arguing for the movement analysis as a more plausible analysis of the data concerning sentence-internal readings of ICs than some other logically possible, and initially somewhat promising, analyses of the same facts. I argued first that a purely sentence-external analysis of all of the IC facts won't do, because the type of context that would have to be introduced to get the right readings for the indefinite DPs would predict the wrong results for definite DPs, among other problems.

I then turned to a general problem for non-movement analyses: the requantification problem. Without the mechanism of trace conversion, available in the movement analysis, where a copy of the indefinite becomes a definite, a different semantics for the [Cond] operator has to be introduced in order to anchor the referent of the indefinite in the consequent to the entity introduced in the understood antecedent. This new definition in turn introduces new problems for other aspects of the theory.

After this, I turned to alternative sentence-internal analyses of the sentence-internal type readings of ICs. I considered two possible analyses, both involving the introduction of a pronoun in the conditional left periphery that is coindexed with some element in the main structure. Thus these analyses are quite similar to the movement analysis, except they do not involve movement. The two analyses considered are: one where the pronoun is coindexed with one of the DPs in the main structure, thus making the semantics nearly identical to that of the movement analysis; and the other where the pronoun is coindexed with the focus semantic value of the main clause.

I argued that both of these two possible analyses, though doing much of the same work as the movement analysis, overgenerate when we consider more complex cases. This is seen most clearly when we consider ICs with multiple indefinites, which turned out to be rather constrained in the type of sentence-internal readings they permit. The data suggests that the movement analysis does the best job of capturing the judgments of such sentences.

Chapter 7

Conclusion

The goal of this thesis has been to determine how sentences of the Implicit Conditional construction are construed. The problem ends up boiling down to the question of what the understood antecedent will be, since the form of an IC resembles the consequent of a full conditional, and so the understood consequent of an IC is less of a puzzle, though it does turn out, at least on my analysis, that the understood antecedent of an IC is not identical to what it might look like from the surface form of the sentence.

Regarding this more specified task, that of determining the understood antecedent to an IC, it turns out that this is done differently in different cases. It is always somewhat dependent on the context, but there are two main types of strategies: sometimes the proposition that serves as the antecedent can be determined purely from the context (in cases where that proposition itself is part of the context), and other times it is the combination of a predicate provided by the context and a (copy of a) DP from within the sentence itself that forms the proposition which serves as the understood antecedent. Although there is another logical possibility, namely that it is not a DP from the sentence that forms part of the understood antecedent, but rather the focus semantic value of the overt part of the sentence, I argued that this option is less descriptively adequate.

Most of the focus has been on sentence-internal ICs where it is an indefinite DP that forms part of the understood antecedent. Even within this somewhat narrow range of ex-

amples there have been some complications. In particular, when the verb of the sentence tends to take a propositional complement semantically, but still takes a DP argument syntactically, then not only do we need to specify the mechanism by which this DP comes to be interpreted as a proposition, but it turns out that the interpretation of the copies of movement change slightly in these readings. I argued that, contrary to most cases, with propositional readings we do want to be able to have requantification of the indefinite noun phrase.

Related to the issue of propositional readings are the readings of definite process nominals and of gerunds. Definite process nominals, it turns out, can be read as propositions, and when this happens, the force of the morphologically present definite article is greatly reduced; in particular, existence and uniqueness of an event is not presupposed. This was tied to its ability to be turned into a proposition “inside”, that is, at the NP level rather than at the DP level, so that the definite article does not end up imposing its presuppositions on the NP directly. A similar pattern of meaning is observed for the Acc-ing gerund, which has a different syntax from a definite process nominal but similar patterns for coercion into a proposition. A Poss-ing gerund, however, was found to have the presupposition that the event it describes happened, and so is subject only to external coercion.

Although the focus has been on sentence-internal ICs with indefinite DPs, sentence-internal ICs with DPs of other types were seen to have some complex behaviors too. In particular, the most natural reading for ICs containing a certain class of DPs, including strong quantifiers, downward-entailing quantifiers, and PPI quantifiers (i.e. *some*) involves a very wide scope for that DP, a reading I labeled the wide-scope sentence-

internal IC. The reason why certain determiners favor certain types of scoping is not yet understood, but it falls into a general problem of the scoping of different determiners, which transcends the issue of ICs per se.

I have kept my scope narrow in this thesis in some ways. I have stuck to ICs which do not have any quantificational adverb, the IC version of what Kratzer (1981) calls “bare conditionals”. That is, I have not considered ICs of the type in (323).

- (323) a. John would definitely kick a unicorn.
- b. John would probably kick a unicorn.
- c. John would not likely kill a unicorn.

These examples would most likely require a generalization of my [Cond] operator, so that the force of the quantificational adverb could take its place. The syntax of that would be a bit complex, since clearly, the quantificational adverbs are not in the conditional left periphery at the surface.

I have also not used generic sentences such as (324) in many examples, despite the fact that they are essentially the indicative counterpart to ICs, which are always subjunctive (hence Kasper’s (1992) name, *simple subjunctive*).

- (324) John generally kicks a unicorn.

This is related to the decision not to discuss quantification adverbs, since generic sentences are most natural when they include a quantificational adverb; sentences like (325) are heavily biased towards an episodic reading, and although they probably also have a

generic reading parallel to the bare versions of ICs, this reading is not readily available and not very workable as a test.

(325) John kicks a unicorn.

I think the main results of this thesis would generalize to generic sentences, but some adjustments would be necessary, such as the different semantics of the generic operator, and the implications of the absence of counterfactual-type presuppositions.

I have argued in this thesis that covert sideward movement exists, for the first time in the literature to my knowledge. I have also argued, contra Nunes (1995, 2001) that an instance of sideward movement need not be followed by an instance of c-commanding movement of the same chain. I must leave it for the most part to further research to determine the extent of the implications of these moves. Sideward movement in general will have to be constrained, probably by a reinterpretation of the Phase Impenetrability Condition (Chomsky 2000) which will keep it from allowing violations of islands for movement. Since the sideward movement I have proposed is within a particular CP, I see no reason why it would violate such a condition, but the exact specification of such a constraint remains to be seen.

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