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(UN)CONDITIONALS: AN INVESTIGATION IN THE SYNTAX AND SEMANTICS OF CONDITIONAL STRUCTURES

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Abstract

(Un)conditionals: an investigation in the syntax and semantics of conditional structures

by

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This dissertation provides a detailed investigation of the syntax and semantic of unconditional sentences, such as "Whether or not Alfonso goes to the party, it will be fun", and "Whoever goes to the party, it will be fun." The guiding theoretical question is how such structures relate to better studied "if"-conditionals, such as "If Alfonso goes to the party, it will be fun." I give an account that unifies the two constructions, and show that they are both species of conditional, broadly construed. Externally, both kinds of structures serve to restrict domains of operators. The differences follow from the fact that unconditionals involve interrogative structure, and consequently the meaning of a question. Where a root question acts pragmatically to raise an issue in discourse, a question meaning in a conditional adjunct acts differently – it acts semantically to provide an exhaustive set of mutually exclusive domain restrictions to a main-clause operator.

The dissertation also provides extensive syntactic arguments that unconditionals involve interrogative structure, as opposed to any kind of relative structure. "Wh-ever" unconditional adjuncts syntactically are closest to root "wh-ever" questions, such as "Whatever happened to Alfonso?". I provide a semantics for such questions, arguing that "-ever" serves to widen the intensional domain of interpretation – the set of possible worlds used to evaluate the question's meaning. This analysis leads to a unified interpretation for "wh-ever" unconditional adjuncts and root "wh-ever" questions.

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This dissertation is about the syntax and semantics of a kind of sentence that I will refer to as an unconditional.[1] Where an "if"-conditional involves making a claim conditional on the content of the adjoined "if"-clause, an unconditional involves making a claim that is independent of the content of the unconditional adjunct. An "if"-conditional and similar examples of unconditionals are shown in (1-4).

(1) If Alfonso comes to the party, it will be fun.

(2) Whether Alfonso comes to the party or not, it will be fun.

(3) Whether Alfonso or Joanna comes to the party, it will be fun.

(4) Whoever comes to the party, it will be fun.

In the "if"-conditional sentence in (1), a claim is made about the party (that it will be fun), but the claim holds only if Alfonso comes to the party. The unconditional sentence in (2) makes claim about the party that is independent of Alfonso's coming – the party will be fun either way. Similarly, in (3) the claim is made that it doesn't matter whether it is Alfonso or Joanna who comes. These two sentences are examples of what I will call *alternative unconditionals*. Example (3) also illustrates another key difference from "if"-conditionals. The choices given in the adjunct have to exhaust the range of possibilities – a speaker of (3) is assuming that either Alfonso or Joanna will come. In (4), an example of what I will call a *constituent unconditional*, opens up the claim even further. Whether the party is fun is completely independent of who it is that ends up coming.

The main goal of this dissertation is to provide an account of the relationship between "if"-conditional sentences and unconditional sentences, and between the types of adjuncts involved. What I argue is that they are literally the same species of sentence – they are both a kind of conditional structure, and the adjunct in each is a kind of conditional adjunct. While this has been suggested by much previous research (see below for a summary), it has never been shown how exactly to treat the two in a unified way. At the center of the dissertation is a compositional semantics for unconditionals that accomplishes this. The key point is that unconditional adjuncts are interrogative structures (something I show in great detail), and this leads to a question semantics. The compositional alternative semantics for questions due to Hamblin 1973 allows us to understand the interaction of an (un)conditional adjunct with the main clause in a new way – they compose "pointwise". What this means is that each alternative in an unconditional adjunct acts on its own to restrict the domain of an operator in the main clause, leading to the sentence being interpreted as a set of conditional claims. The meaning triggered by the interrogative structure also leads to the presupposition that the alternatives

[1] This name is due to Dietmar Zaefferer. See discussion in §1.2 for further discussion of the naming issue.

involved are exhaustive and mutually exclusive; in consequence the construction patterns with other free choice constructions.

A key feature of the unification is that unconditionals and "if"-conditionals differ only in their internal structure, and it is this internal structure that leads to their different semantic effect. Externally, their semantics is the same. The approach I take to their external semantics generalizes what Partee 1991 terms the Lewis-Kratzer-Heim view of "if"-clauses. This view is that the function of an "if"-clause is to provide restrictions to the domains of operators. I turn the idea on its head and propose that any adjunct that serves to restrict the domain of operators in its scope should be classed as a conditional.

This unification has the consequence that we must disassociate the notion of conditional from the word "if", a point that has its roots in Lewis 1975. I develop an account of where that notion should be represented (in a feature on complementizers), and what kinds of factors constrain its distribution. I show that the distribution of conditional adjuncts can be derived from the semantics of this feature, on an account of adjunct distribution that is semantically driven.

1.1 Overview of the dissertation

Chapter 1 describes the facts that an account of unconditionals must cover in order to be empirically adequate. I also discuss previous accounts of unconditionals, and how they fare both in terms of capturing the facts, and their compositionality.

Chapter 2 gives a detailed account of the syntax of unconditional adjuncts. Internally, unconditionals have an interrogative structure; I give a range of tests to demonstrate this. This argues against previous accounts that have assumed they involve a nominal or free relative-like structure. Externally, unconditionals have the properties and distribution of "if"-conditional adjuncts. I discuss in informal terms the existing proposals on where "if"-conditionals sit at the syntax/semantics interface, and what new evidence unconditionals bring to these debates.

Chapter 3 presents a compositional account of the interpretation of unconditionals in a Hamblin semantics. Each piece of the analysis is independently motivated, and follows from a piece of the syntactic structure argued for in chapter 2. I discuss how this analysis handles the data introduced in chapter 1, and how it relates to previous analyses.

Chapter 4 has two parts. The first gives an account of the meaning of "-ever", focusing on root questions and unconditionals (which have the same semantics). The proposal is that "-ever" contributes a presupposition that the domain (a Stalnakerian context set) is wide, relative to the alternative set involved in the question. This leads to the inference of speaker ignorance, especially in episodic contexts. I sketch an extension of the proposal to free relatives. The second part of chapter 4 discusses the distribution of interrogative adjuncts in English, and what constrains the range of clauses that are usable as adjuncts. I develop an account of their distribution based on the distribution of the COND operator used for conditional meaning in chapter 3. I sketch an explanation of some of the distributional facts based on question bias.

Finally, chapter 5 summarizes the major results of the dissertation and discusses some open

questions.

1.2 Terminology

Types of (un)conditionals and related constructions I have introduced two types of unconditionals already, alternative and constituent. These names are taken from familiar terms in the literature on questions, for alternative and constituent interrogatives respectively. In chapter 2 I tighten this connection and provide evidence that these are not just useful but correct terms, in that the adjunct clauses are interrogative. I refer to the kind of conditional involving "if" as the "if"-conditional, and generally reserver the term "conditional" for the entire class rather than just this type. I will also use the term "(un)conditional" to refer to the class of structures including both "if"-conditionals and unconditionals. In some cases (mostly in chapter 4) for lack of a better term, I will use the term "if"-conditional to refer to the type of conditionals instantiated by English adjoined "if"-clauses, rather than the English construction.

Another class of unconditional that I discuss at various points is the class of headed unconditionals:

(5) No matter who comes to the party, it will be fun.

(6) Regardless of who comes to the party, it will be fun.

Finally, there is a class of unconditionals that I will not discuss much here; these are unconditionals formed with bare predicates of various kinds. (See Rawlins 2006; Pullum and Rawlins 2007 for further discussion of this kind of unconditional; the analysis in Rawlins 2006 treats them as a kind of alternative unconditional involving unpronounced structure.)

(7) Good or bad, we have to fire him.

(8) Linguist or philosopher, he should be easy to entertain.

(9) Iraq war or no Iraq war, the party has to happen tomorrow.

Closely related to unconditionals are concessive conditionals (Bennett 1982, 2003; König 1986; Haspelmath and König 1998; Lycan 1991, 2001; von Fintel 1994; Guerzoni and Lim 2007; Matsui 2008).

(10) Even if Alfonso comes to the party, it will be fun.

While such sentences can have a very similar meaning to some unconditionals, I do not take them to be a type of unconditional. Instead, following the majority approach in the literature cited above, I take them to be a type of "if"-conditional that has been modified compositionally with "even". I will not focus on concessive conditionals in this dissertation.

Finally, there are concessives (König 1985, 1986, 1988; Rudolph 1996; Kruijff-Korbayova and Webber 2001 among others):

(11) Even though Alfonso is coming to the party, it will be fun.

(12) Although Alfonso is coming to the party, it will be fun.

(13) Despite Alfonso coming to the party, it was fun.

Some researchers have treated unconditionals as a kind of concessive (see e.g. Izvorski 2000b). I will not do so here, and this dissertation will by and large not address concessives. A major reason to not class unconditionals with true concessives is that concessives presuppose their antecedent, and therefore act more like e.g. "because"-clauses than any type of conditional.

Parts of unconditionals Following much literature on "if"-conditionals, I will use the terms "antecedent" and "consequent" to refer to the unconditional adjunct and the main clause respectively. For the moment, these terms can be thought of simply as convenient descriptive terminology. In chapter 2 I argue that they have a very real theoretical sense, in that the relationship of an unconditional adjunct to the main clause in an unconditional is the same as the relationship of an "if"-clause adjunct to a main clause.

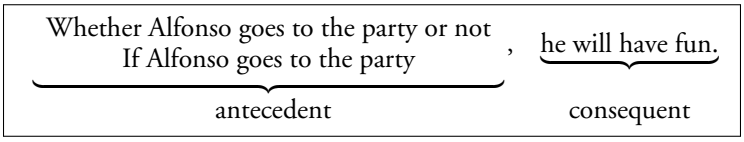


Figure 1: Terminology for parts of an unconditional

Naming unconditionals Practically everyone who has written on unconditionals has given them a different name. König 1986 calls them "concessive conditionals" (subdivided into alternative and universal concessive conditionals, involving "whether...or..." and a "wh-ever" item respectively). Haspelmath and König 1998 use the same terminology. Following this Gawron 2001 adopts "universal concessive conditionals" for the entire class. In previous work of mine, without considering the potential confusion, I adopted "alternative concessives" for the whole class. Zaefferer 1990, 1991 calls them "unconditionals".[2] Izvorski 2000a,b, writing specifically about the subclass involving wh-items, calls them "free adjunct free relatives" (though that they are free relatives at all is an assumption, not a conclusion of that work, and one that I show is incorrect.) Huddleston and Pullum 2002 call them "exhaustive conditionals," with some further sub-categories: governed exhaustive conditionals involve "no matter" or "regardless"; ungoverned closed exhaustive conditionals involve a plain "whether...or...", and ungoverned open exhaustive conditionals involve "wh-ever". Klinedinst 2004 referrs to the "wh-ever" kind as "*-ever* concessives."

Merin 2007, apparently unaware of Zaefferer's work, further confuses the issue by adopting the name "unconditional" for a different construction. These are "if"-conditionals that philosophers typically call "biscuit" conditionals following John Austin's famous example ("There are

[2]For an earlier use of this term, see Zaefferer 1987, which I have not seen.

biscuits on the sideboard if you want them", Austin 1956a), and linguists typically call "relevance" conditionals or "conditional speech acts" (van der Auwera 1986; Iatridou 1991). Merin calls these unconditionals because they entail their consequent, placing no conditions on it. Perhaps a better term, compared to the unconditionals I am discussing here, would be "non-conditionals", since they do not actually *unconditionalize* their consequent. In terms of the Lewis-Kratzer-Heim theory, it is not that they prevent some contextual domain restriction, they simply do not impose any. When I talk about conditionals of this kind in this dissertation, I will refer to them as relevance conditionals.

In this dissertation I adopt from Zaefferer the term "unconditional" as a term for "whether ... or..." sentences, "wh-ever" sentences, and "no matter/regardless" sentences. Other options may be more precise or have more historical priority, but "unconditional" is short and memorable. It conveys both their deep connection to conditional meaning (something stressed by all of the above authors) and the core intuitive difference from conditional meaning – that they unconditionalize their consequent. I will use the term "concessive conditional" exclusively for "even if" conditionals and related structures.

1.3 Semantic and pragmatic properties of unconditionals

This section discusses the semantic and pragmatic facts that have to be explained by any analysis of unconditionals. I highlight three components of the meaning of unconditionals. The main component is the *indifference implication* (I use "implication" as a neutral term, not yet distinguishing between entailments, presuppositions, and implicatures) – that the choice of alternative in the antecedent doesn't matter. I show that this is an at-issue entailment, and as such should be the main product of the compositional semantics of unconditionals. A property that can be viewed as a corollary of the indifference implication is consequent entailment: unconditionals uniformly entail their consequent in an intuitive sense.

Supporting the indifference implication are two presuppositions, which I call *distribution* and *exhaustiveness*. The first of these is the presupposition that all of the alternatives are possibilities (relative to the modality involved), and the second is that the alternatives are the only possibilities (again relative to the modality). These two presuppositions are the key to understanding the effects of unconditionals in discourse, and also important to understanding the distinction between unconditionals, plain modalized sentences and conditionals.

In §1.3.1 and 1.3.2, I describe the indifference implication and explore its properties. Following that I explore the interpretive differences between unconditionals and conditionals in §1.3.4, and between unconditionals and plain modalized sentences in §1.3.5. Finally, I examine the interpretation of an unconditional relative to larger discourses in §1.3.6.

1.3.1 Indifference implication: description

Unconditionals involve an *indifference implication*, which in some ways is intuitively akin to the kind of "indifference" reading seen with "wh-ever" free relatives and other free choice constructions (see chapter 4 for further discussion of the similarities and differences). The

indifference implication is the major component of the meaning of an unconditional, and as such one of the main goals of this dissertation is to show how to derive it compositionally.

In (14), for example, the sentence intuitively says that it doesn't matter whether Alfonso is great at his job – we'll have to fire him no matter what.

(14) Whether Alfonso is great at his job or not, we should fire him.
(implication: it doesn't matter whether he's great)

The indifference implication arises in the full range of unconditionals.

(15) Whatever we do, we'll lose. *(implication: it doesn't matter what we do)*

(16) Whichever route we take, we'll get to the beach eventually.
(implication: it doesn't matter which route we take)

(17) Great worker or not, we have to fire him.
(implication: it doesn't matter whether he is great)

(18) Regardless of what happens, John will host the party.
(implication: it doesn't matter what happens)

(19) No matter what happened, John won the competition.
(implication: it doesn't, or it didn't, matter what happened)

To see the parallel with "wh-ever" free relatives, compare (16) above with (20), a sentence involving a "free choice" free relative.

(20) Whichever route we take will get us to the beach eventually.
(implication: it doesn't matter what route we take)

Intuitively, both examples involve the identity of the route to the beach not mattering for the purposes of the end goal (to get to the beach). I return to this connection in chapter 4.

Many questions now arise about the indifference claims made by unconditionals. I have been using the term "implication" in order to be neutral about what kind of meaning the claim of indifference is – but to understand indifference we must see whether the implication is an entailment, implicature, or presupposition. Questions also arise about whether it is unique to unconditionals, or present in a wider range of adjuncts or constructions. I turn to these kinds of questions in the next several sections.

1.3.2 Indifference implication: properties

In this section I show that the indifference implication is an at-issue entailment contributed by an unconditional – part of its truth-conditional content. In the process, I show that it is not a conversational implicature, and that it is not a presupposition.

Showing this is important for descriptive reasons, and also for analytical reasons. If the indifference implication were a conversational implicature, we'd expect its derivation to proceed along very different lines than if it were not. In particular, it should be derivable from general

conversational principles such as Gricean maxims, or some such theory (see Grice 1975; Gazdar 1979; Levinson 1983; Horn 1989 among many others). If it is an at-issue entailment or presupposition, it should follow compositionally from the syntactic pieces of an unconditional, i.e. conventional meaning.

Aside from defining expectations for the analysis developed in chapter 3, the kind of meaning is important with respect to previous analyses of unconditionals and related constructions. Klinedinst 2004 has proposed (translating into my terms) that the indifference implication is an implicature, and his analysis-internal reasons for assuming this seem to apply to the analyses of Zaefferer 1990 and Gawron 2001.[3] Establishing the correct kind of meaning for the indifference implication will help to choose between and evaluate these theories.

Determining whether the indifference implication is a presupposition or not is important relative to analyses of "-ever" free relatives (FRs). Several analyses of indifference in "-ever" FRs treat it as a presupposition, though it is not clear whether this is right (see Dayal 1997; von Fintel 2000; Condoravdi 2005 for discussion of the issue). We will see that the indifference implication in unconditionals is quite clearly not a presupposition, providing a further distinction (beyond the syntactic ones in chapter 2) between unconditional adjuncts involving "-ever" and "-ever" FRs.

If the indifference implication were a conversational implicature, we'd expect it to be cancelable (Grice 1975). It is not, though it is somewhat tricky to phrase the attempt at cancellation. In the examples below I use two methods; the first negates the paraphrase I have been using for the indifference implication, and the second tries to re-conditionalize the negation of the consequent with an "if"-clause.

(21) Whether or not Alfonso is a great worker, we have to fire him.
   a. # ...and whether he is a great worker does matter.
   b. # ...and if he is a great worker, we don't have to fire him.

(22) Whatever Alfonso is good at, we have to fire him.
   a. # ...and whether he is good at web design does matter.
   b. # ...and if he is good at web design, we don't have to fire him.

(23) No matter what Alfonso is good at, we have to fire him.
   a. # ...and whether he is good at web design does matter.
   b. # ...and if he is good at web design, we don't have to fire him.

None of these attempts at cancellation work, suggesting the indifference implication is not a conversational implicature (contra Klinedinst 2004).

Next I turn to the behavior of indifference in embedded contexts; this can be used as a three way diagnostic. Assuming indifference is not a conversational implicature, if it can

[3]However, I doubt that either author would agree with the claim that it is an implicature, and I think their analyses do not fundamentally require this assumption if more development is done. See discussion later in the chapter.

project out of complex structures (presupposition "holes" in Karttunen's 1973 terminology), it is a presupposition, and otherwise, it is an at-issue entailment (cf. Karttunen 1974 and much subsequent literature). If it were an implicature, we'd expect behavior in embedded contexts that patterns with other kinds of implicatures; this is harder to describe succinctly, but it is something like a mix of projection and cancellation depending on the context.

Under negation (via "it is not the case that ..." and similar expressions), the indifference implication is negated. This can be seen in (24):

(24) It is not the case that we'll have to fire Alfonso whether he is great at his job or not.

(25) It is not the case that we have to fire Alfonso whatever he is good at.

(26) It is not the case that we have to fire Alfonso no matter what he is good at.

These examples can all be paraphrased in part as "it **does**, or at least may, matter whether he's great at his job or not/good at something." If the indifference implication were a presupposition, we'd expect it to project, and remain unnegated, but this is not what happens – the indifference implication is the direct target of negation. Note also that if the indifference implication were a conversational implicature, we'd expect different behavior as well. Negation would target the at-issue content (presumably the consequent), and we'd get either cancellation of the implicature or some sort of scale reversal (cf. Gazdar 1979; Atlas and Levinson 1981; Hirschberg 1985; Horn 1989, and Sauerland 2004 for recent discussion). We would need a more worked out theory of how the implicature would be generated to see whether the effect in (24) could be described as scale reversal. (That is, it is not clear that the implicature could be generated in a scalar way, or what the scale would be.) What is clear is that we do not get negation of the consequent. That is, (24) doesn't convey as part of its meaning that we won't have to fire Alfonso.

Embedding under negation, while extremely well-studied, is notoriously susceptible to problems about meta-linguistic negation, so I now turn to other kinds of embedded structures. Putting unconditionals in the complement of attitude verbs is also revealing of their status.

(27) Joanna believes that we'll have to fire Alfonso whether he is great at his job or not.

The indifference implication in (27) must be part of Joanna's beliefs. There is no ambiguity or vagueness with respect to who the attitude holder is for the indifference implication; it must be Joanna, and not the speaker, who thinks it doesn't matter whether Alfonso is great it his job. This contrasts with presupposition projection from the complement of attitude verbs. In isolation, sentences like (28) appear to presuppose that Alfonso has a wife – we see projection-like behavior. With appropriate context, as in (29), the presupposition disappears.

(28) Alfonso believes that we'll have to fire his wife.

(29) Alfonso is under the misconception that he is married, and believes that we'll have to fire his wife.

Regardless of the explanation for this behavior (see Heim 1992; Karttunen 1974 among others for discussion), the indifference implication in (27) does not behave like a presupposition. The default for a presupposition would be projection-like behavior (even if it is not true presupposition projection, as Karttunen and Heim argue), where the speaker appears to presuppose the content of the embedded presupposition, but in (27), the indifference implication is clearly part of Joanna's beliefs only. There is no hint of projection.

Finally, and perhaps most convincingly, in a host of other embedded contexts, the indifference implication must be locally interpreted. Note that in many cases it is difficult to get the unconditional adjunct left-adjoined, but I don't see any difference in interpretation that is relevant here. In (30) I've given the adjunct inside an "unless"-clause, and in (31), it is in an "if"-clause.

(30) Unless we have to fire Alfonso whether he is good at his job or not, Joanna will not quit the company.

(31) If we have to fire Alfonso whether he is good at his job or not, Joanna will quit the company.

(32) If we have to fire Alfonso whatever he is good at, Joanna will quit the company.

The indifference implication in (30) is part of the meaning of the "unless" clause – it can be paraphrased as "unless we have to fire him no matter what." The implication is similarly part of the "if"-clause in (31). and (32). If it were a presupposition, we'd expect it to project.

This section has shown that indifference implications are not presuppositions or conversational implicatures. An indifference implication, in the case of unconditionals, is part of the at-issue, truth-conditional entailments of the sentence, and as such is always interpreted locally and compositionally in embedded contexts. Indifference is the target of operators such as negation that compose with an unconditional sentence, and it is interpreted uniformly as part of the content of an attitude report. The main consequence is that we should expect that the indifference entailment arises compositionally from the interpretation of an unconditional sentence.

1.3.3 Unconditionals vs. *if*-conditionals: similarities

Unconditionals and "if"-conditionals have interpretive similarities that have been noticed in the previous literature. I present these here simply as properties of unconditionals, and return to the issue again in chapter 2, in motivating a conditional analysis of unconditionals.

Nearly all literature on unconditionals has suggested that unconditionals have a meaning like that of conditionals (König 1986; Zaefferer 1990, 1991; Lin 1996; Haspelmath and König 1998; Izvorski 2000a,b; Gawron 2001; Huddleston and Pullum 2002). This intuition is somewhat difficult to flesh out, but there are two ways that have been suggested. The first is that unconditionals often have a close paraphrase as a list of "if"-conditionals (König 1986; Lin 1996; Haspelmath and König 1998). This is easiest to see with alternative unconditionals:

(33) a. Whether or not Joanna comes to the party it will be fun.

b. If Joanna comes to the party it will be fun, and if she doesn't it will be fun.

(34) a. Whether Alfonso or Joanna brings the beer, it will be a good brand.

b. If Alfonso brings the beer it will be a good brand, and if Joanna brings it, it will be a good brand.

Note that there are some components of the meaning of unconditionals that it is not clear are entirely captured by these paraphrases. The main one is that in (34a) there is a sense that Alfonso or Joanna are the only people who might bring the beer, and the "if"-conditional paraphrase in (34b) doesn't necessarily convey this. I discuss this property below, in the form of an exhaustiveness effect. But at least some component of the unconditional meaning is conveyed by such a paraphrase.

Constituent unconditionals can be paraphrased in a similar way, except that we are forced to the use of metalinguistic devices (e.g. "...") to enumerate the full list of conditionals that make up the paraphrase:

(35) a. Whoever comes to the party it will be fun.

b. If Alfonso comes, it will be fun, and if Joanna comes, it will be fun, and if Henry comes, it will be fun ... and if Fruela comes, it will be fun.

If the domain were tightly constrained it would of course not be necessary to use the ellipsis, but in most uses of any "wh"-item, the domain is quite vague. Once again it isn't clear that this paraphrase captures the exhaustiveness effect present in the unconditional.

In summary, an account of unconditionals should explain why these paraphrases are so close, and why they feel natural to many native speakers.[4]

The second way of trying to make the parallel with "if"-conditionals more grounded is suggested by Gawron 2001. Gawron notes that on many theories following Lewis 1975, an "if"-clause adjunct serves to restrict the domain of some operator, and that unconditionals do this as well. I develop this idea in the remainder of this section.

The key empirical observation introduced into the literature on conditionals by Lewis 1975 is that "if"-conditionals interact with quantificational domains of operators. By "operators" here I mean adverbs of quantification, and modal auxiliaries. To make this concrete, consider the example in (36).

(36) My roof *always* leaks.

[4]Of course, there are also examples where such a paraphrase is not natural. The following example, due to Geoffrey Pullum (p.c.) illustrates this:

(i) Whatever you order, you shouldn't get the haggis.

This quite clearly cannot be paraphrased with "if you order the fish and chips, you shouldn't get the haggis" and so on. Rather it has to be paraphrased with something like "if you order x, you shouldn't also order the haggis" or "if your order is x, x shouldn't include the haggis".

Let us suppose that "always" quantifies over situations or cases. It quantifies universally. However, in this example, we can't be considering all situations, or even a large random sampling of them. The speaker of (36) probably means to consider only situations where it is raining. So adverbs of quantification are sensitive to contextual restriction of the domains they quantify over. Lewis' observation is that "if"-clauses can be used to explicitly restrict this domain:

(37) If it is raining, my roof *always* leaks.

(38) If it is raining very hard, my roof *always* leaks.

In (37) we must be considering only situations where it rains, and in (38), we consider situations only where it is raining very hard. (38) is perfectly compatible with the roof not leaking at all unless it is raining very hard, as long as when we restrict ourselves to situations where it rains hard, the roof leaks in all of these situations.

The same observation carries over to modal auxiliaries. In (39), there is no overt restriction, and the speaker indicates that in all situations compatible with his or her desires, the hearer comes to the party. The conditional sentence in (40) uses an "if"-clause to explicitly narrow down the domain of quantification; in this sentence we do not consider all salient situations compatible with the speaker's desires, but only those where the party is at Joanna's house.

(39) You *should* come to the party.

(40) If it is at Joanna's house, you *should* come to the party.

We know from von Fintel 1994 that restriction isn't the only kind of interaction that an adjunct has with an operator. "Unless"-clauses serve to perform an exceptive operation on a quantifier domain. In (41) we consider only situations where the party *isn't* at Joanna's house.

(41) Unless it is at Joanna's house, you *should* come to the party.

The question now is whether unconditional adjuncts impose any conditions on the quantificational domains of operators in their scope, and if so, what kind of conditions they impose. They do seem to impose a condition of some sort. In (42), the condition is that out of the salient situations compatible with the speaker's desires, we have to consider both situations where Alfonso does come to the party, and situations where he doesn't.

(42) Whether or not Alfonso comes to the party, you *should* come.

That is, it isn't possible to do either explicit or implicit domain restriction to get around this requirement. It also isn't possible to use an "unless"-adjunct to get around it.

(43) # If Alfonso comes to the party, whether or not Alfonso comes to the party, you *should* come.

(44) # Unless Alfonso comes to the party, whether or not Alfonso comes to the party, you *should* come.

(45) # (Both speakers know that Alfonso is coming to the party.) Whether or not Alfonso comes to the party, you *should* come.

A similar point can be made with constituent unconditionals.

(46) Whoever comes to the party, you *should* come.

(47) # If Alfonso comes to the party, whoever comes to the party, you *should* come.

(48) # Unless Alfonso comes to the party, whoever comes to the party, you *should* come.

(49) # (Speakers know exactly who is coming to the party.) Whoever comes to the party, you *should* come.

The combination of "if"-conditionals/exceptives and unconditionals is generally possible, as long as the restrictions and unrestrictions don't conflict.

(50) If the party is at Joanna's house, whether or not Alfonso comes to it, you *should* come.

(51) If the party is at Joanna's house, whoever comes to it, you *should* come.

(52) Unless the party is at Joanna's house, whoever comes to it, you *should* come.

So, empirically, unconditionals impose a condition on the domain of quantificational operators in their scope. It is not obvious that this condition is either of the two known operations (restriction, exception). It clearly doesn't pattern with the condition imposed by exceptives. One possibility is that unconditionals represent a new operation, e.g. "unrestriction". The accords with Zaefferer's 1990 intuition that the function of an unconditional is to "remove background assumptions." Domain restrictions for operators (modals especially, under a premise semantics; Veltman 1976; Kratzer 1977 etc.) can be thought of as collections of background assumptions. An unconditional makes sure that certain background assumptions aren't in force. Another possibility, and the possibility that I will argue for in chapter 3, is that what we are seeing is restriction in a more complicated form. In any case, the interaction of an unconditional adjunct and the domain of an operator in its scope must be accounted for.

1.3.4 Unconditionals vs. *if*-conditionals: differences

There are two primary interpretive differences between unconditionals and "if"-clause conditionals: whether the consequent is entailed, and whether an indifference implication is present (or possible). I discuss the issue of consequent entailment and the indifference implication in turn.

With "if"-clause conditionals the consequent is typically not entailed, but in an unconditional, the consequent **is** entailed. This can be seen from the following examples, involving a continuation denying the consequent.

(53) Whether or not Joanna is in town, Alfonso won't come to the party.
#Alfonso is coming to the party.

(54) If Joanna is in town, Alfonso won't come to the party.
✓Alfonso is coming to the party. (...therefore Joanna must not be in town.)

The obvious question is whether the two constructions are completely opposed on this point. They are not – certain kinds of "if"-conditionals entail their consequent. In particular, "if"-conditionals that receive what Haiman 1986 and König 1986 describe as a concessive interpretation typically do entail their consequent, and appear to otherwise be normal "if"-conditionals. These can involve an "even" (which forces the concessive reading), but "even" is not necessary (König 1986; Iatridou 1994). The following examples are from Haiman 1986:

(55) I wouldn't marry you (even) if you were the last man on earth.

(56) They'll get you (even) if it's the last thing they do.

The first example entails that the speaker wouldn't marry the hearer, and the second that they will get the hearer. See Haiman for arguments that these conditionals are true conditionals.

König 1986 proposes that this kind of concessive interpretation arises when the antecedent contains "an expression marking a suitable extreme value on some scale for some propositional schema." The following examples are due to König (in my judgment they require some intonational emphasis on the element that is supposed to be the extreme value of the scale):

(57) If we give him the VIP treatment he won't be content.

(58) If I drink a bottle of alcohol, my boss won't fire me.

Each of these (with suitable intonation) entails the consequent. The reading can also, of course, be brought about by marking the "if"-clause with "even". In general I am assuming, following Bennett 1982; Lycan 1991; von Fintel 1994; Lycan 2001; Bennett 2003; Guerzoni and Lim 2007, that the proper way to treat an "even if" adjunct is as the meaning a regular "if" adjunct combined with the meaning that "even" has; this means that the behavior of "even if"-clauses reflects upon the properties of "if"-conditionals in general. The examples above optionally involve "even", but many examples of "even if"-conditionals entail their consequent even when their "even"-less counterpart doesn't:

(59) a. Alfonso will go to the party even if Joanna is there.
b. Alfonso will go to the party if Joanna is there.

What can we conclude from this set of facts? It is clear that there can't be a constraint preventing "if"-conditionals from entailing their consequent. Therefore we should not be extremely surprised to find varieties of conditionals (e.g. unconditionals) that consistently do. König's generalization about scalarity leading to consequent entailment in "if"-conditionals seems on the right track, so it is something about the lack of such scalarity that results in "if"-conditionals normally not entailing their consequent. Unconditionals, in contrast, seem to always entail their consequent, and they don't obviously have a scalar meaning.[5] This is

[5]However, see the scalar treatment of "-ever" in Gawron 2001.

therefore what an analysis of unconditionals needs to account for – that the appearance of consequent entailment in unconditionals seems to arise for different reasons than the cases where it arises in "if"-conditionals. A semantics of unconditionals should predict uniform consequent entailment, and this should follow from some specific properties of unconditionals.

The second major distinction involves the indifference implication. Unconditionals always carry it; "if"-clause conditionals do not. In fact, it is difficult or impossible to use "if"-conditionals to *convey* indifference. We might expect "whether" and "if" adjuncts with disjunction to both get similar interpretations, in examples like those below. They don't (the observation originates from Haiman 1986):

(60) Whether Alfonso dances with Joanna or Fruela, he will make a fool of himself.

(61) If Alfonso dances with Joanna or Fruela, he will make a fool of himself.

In the unconditional, the speaker communicates that Joanna and Fruela are the only possible dancing partners. This isn't communicated with the "if"-clause conditional, and there is not the same sense that it doesn't matter who he dances with. Note that (61) is *compatible* with it not mattering who Alfonso dances with, but this is not something that the sentence conveys.

It is not possible to get an indifference implication of the sort I've been describing out of the "if"-conditional. This distinction sharpens when we choose a disjunction that is guaranteed to exhaust its domain independently of where it appears:

(62) Whether Alfonso goes to the party or doesn't go to the party, he will be bored.

(63) # If Alfonso goes to the party or doesn't go to the party, he will be bored.

The "if"-clause resists the exhaustive interpretation, and consequently the indifference implication.

If it is right that unconditionals are a kind of conditional, we want to be able to predict that unconditionals always have the indifference implication, and that "if"-conditionals don't. The fact that they don't, at least in English, seems to be connected to the fact that they aren't compatible with exhaustiveness.

1.3.5 Unconditionals vs. plain modal sentences

In this section I compare unconditionals with plain modal sentences. This comparison is important because previous analyses have tended to make the truth conditions of unconditionals, at least in certain contexts, equivalent or very close to those of plain modal sentences. I am going to argue that they are truth-conditionally distinct. The main content of an unconditional is the indifference implication, which is not present in a plain modal sentence.

There is a further difference in presupposition from a plain modal sentence; this I examine in the next section (§1.3.6).

Compare the unconditional in (64) to the discourse in (65), focusing on the final sentence in that discourse.

(64) Whether Alfonso dances with Joanna or Fruela, he will make a fool of himself.

(65) Alfonso is going to dance with someone, and it's either Joanna or Fruela. He will make a fool of himself.

We might expect this final sentence to convey the same thing as the unconditional. Intuitively it does not seem to. It does convey something very similar – Alfonso is guaranteed to make a fool out of himself. The difference is that nothing about this sentence ensures that it is the identity of his dancing partner that doesn't matter in particular. We can see this from the fact that (65) could be easily followed by a continuation such as "he always makes a fool of himself at parties." The unconditional in (66) cannot, without a loss of coherence:

(66) Whether Alfonso dances with Joanna or Fruela, he will make a fool of himself. #He always makes a fool of himself at parties.

To help secure the intuition about this difference between plain modal sentences and unconditionals, compare the dialogue in (65) with the following one:

(67) Alfonso is going to dance with Joanna or Fruela. He will make a fool of himself regardless.

The adverb "regardless" contributes an unconditional meaning that takes the alternatives from prior discourse context; this sentence clearly means something different from (65). In summary, there is a strong and reproducible intuitive difference between unconditionals and plain modal sentences in similar contexts.

At this point it would be nice to see a non-intuition-based argument for the difference. That it is a truth conditional distinction can be seen by examining earlier data involving embedding of unconditionals. If there is no truth-conditional distinction between an unconditional and a plain modal sentence in the right context, we would expect them to mean the same thing when embedded. They do not.

(68) It's not the case that whether Alfonso dances with Joanna or Fruela, he will make a fool of himself.

(69) Alfonso is going to dance with someone, and it's either Joanna or Fruela. It's not the case that he will make a fool of himself.

The negated unconditional in (68) is perfectly compatible with Alfonso making a fool of himself; what it establishes is that the identity of his partner may matter. The negation of the plain sentence in (69) does not establishes this, and claims that he won't make a fool of himself in any circumstance. What is negated in the unconditional is the indifference implication.

In summary, an unconditional has to be at least distinct enough from a similar plain modal sentence that it behaves correctly under negation. Further, it has to be different enough that the indifference implication is directly conveyed by an unconditional, and not by a plain modal sentence.

1.3.6 Unconditionals in discourse – distribution and exhaustiveness

Unconditionals have a characteristic use in discourse that is distinct from both plain modal sentences and conditionals. It is a way of deflecting an issue without bringing it into further discourse, or not taking a stance on an issue. This is illustrated in the following discourse:

(70) A: Alfonso is really great at his job.
B: Whether or not he's great at his job, we have to fire him.

Speaker A makes a claim, and speaker B responds by unconditionalizing some larger issue with respect to that claim. In doing so, speaker B avoids taking any stance with respect to A's claim. In this case, B does not commit themselves to whether Alfonso is great at his job, suggesting that they may disagree or not know – and they further claim that the resolution of the issue of whether he's good at his job doesn't matter to deciding to fire him. (Of course, it is also possible for B to further accept A's claim in later discourse.)

In terms of the common ground of the discourse (Stalnaker 1978), A's move attempts to introduce into the common ground the claim that Alfonso is great at his job. B's move implicitly rejects this move, resulting in it not entering the common ground. I call it an implicit rejection because there is no explicit argument between the speakers about the claim, or direct denial of it; nonetheless the issue remains unresolved.

Contrast the issue-avoiding use of unconditionals with plain sentences and conditionals in similar contexts:

(71) A: Alfonso is really great at his job.
B: ? We can/can't fire him.

(72) A: Alfonso is really great at his job.
B: If he's great at his job, we can't fire him.
B': # If he's not great at his job, we can fire him.

The plain sentence in (71B) is slightly odd (it would be improved by some kind of discourse particle; "therefore" or "so") but involves the implicit acceptance of A's claim. It cannot be used to avoid taking a stance on the issue. (Of course, with an unconditional adverb like "regardless" or "either way", it can be used this way.) Similarly neither the positive or negative conditional in (72B) and (72B') can be used to avoid taking a stance on the issue. The positive form gets interpreted as a "modus-ponens" conditional (see Akatsuka 1985; Zaefferer 1990, 1991; Iatridou 1991; Schwenter 1999), and accepts A's claim as a premise for concluding the consequent. The negative form is simply odd.

This issue-avoiding behavior is therefore a substantial pragmatic difference from plain sentences and "if"-clause conditionals; accounting for it is quite important. Furthermore, it is a pattern that previous work has not noticed.

The issue-avoiding effect correlates with two contributions of unconditionals; I will call them the distribution and exhaustiveness presuppositions respectively. The first presupposition is the claim that all alternatives mentioned in the unconditional adjunct are live possibilities in

the discourse. The second is that they are the only ones. Unconditionals in general have these presuppositions, regardless of whether someone has made claims about one of the alternatives or not. To see further evidence for the exhaustiveness effect, consider the following data from Zaefferer 1990 (Zaefferer marked the second example with '?', I have changed this to '#'):

(73) If you take the plane to Antwerp, the trip will take three hours; if you take the car or go by train, it will take ten hours.

(74) # If you take the plane to Antwerp, the trip will take three hours; whether you take the car or go by train, it will take ten hours.

A disjunctive "if"-conditional is perfectly compatible with other possibilities being explicitly introduced in previous discourse, and an unconditional is not. The unconditional in (74) seems to suggest that the previous conditional sentence was wrong – it contradicts it.

That both exhaustiveness and distribution are presuppositions can be seen by again examining the projection facts, this time paying attention to what the speaker believes is possible, rather than what doesn't matter.

(75) It isn't the case that Alfonso will make a fool of himself whether he dances with Joanna or Fruela.

(76) If Alfonso will make a fool of himself whether he dances with Joanna or Fruela, I'm no judge of dancers.

(77) Unless Alfonso will come to the party whether or not he's in a good mood, we should give him a call.

Each of these sentences still conveys that both alternatives are possible, and are the only possibilities (relative to some modal). Alfonso can either dance with Joanna or Fruela, and either Alfonso's coming to the party in a good mood or bad is possible.

"If"-clause conditionals lack the exhaustiveness presupposition of an unconditional. This is evident from the fact that they do not claim that the antecedent is the only possibility, and that they resist exhaustive disjunction. "If"-conditionals do not involve a distribution presupposition in the same sense as unconditionals.[6]

1.3.7 Summary

There are three main components of the meaning of an unconditional that an analysis must account for. These are the indifference entailment, and the distribution and exhaustiveness presuppositions. I have argued that the indifference entailment is in fact an entailment, and constitutes the main distinction between unconditionals on the one hand, and plain modal sentences and "if"-clause conditionals on the other. The distribution presupposition also distinguishes unconditionals from these two other groups; I have argued that it is a presupposition

[6] However I will later argue that the source of this distribution presupposition is a presupposition present in any modal claim, taken in aggregate.

and that it explains the unique behavior of unconditionals in discourse. Finally, we must explain that unconditionals entail their consequent.

The following chart summarizes these components:

(78) **Empirical objects of the analysis**

- INDIFFERENCE: at-issue entailment, does not project, can be embedded.
  Paraphrase: "The choice of alternative does not matter."
- INTERACTION WITH AN OPERATOR: the "unrestriction" effect.
- DISTRIBUTION: presupposition, does project.
  Paraphrase: "Each alternative is possible."
- EXHAUSTIVENESS: presupposition, does project.
  Paraphrase: " The alternatives are the only possibilities."
- DISCOURSE PROPERTIES: can be used to avoid taking a stance on an issue.
- CONSEQUENT ENTAILMENT: the consequent of an unconditional is entailed.

The challenge of understanding unconditionals is explaining how to derive these semantics and pragmatic properties from the pieces of an unconditional.

1.4 Previous analyses of unconditionals

In this section I discuss several previous analyses of unconditionals, focusing on the ways in which they capture facts discussed in the previous section, and the ways in which they don't. I also examine the way in which they are compositional, and the motivations for that compositionality. Though many of the analyses capture some of the facts discussed above, none capture them all. Further, I argue that for the previous accounts of English, the particular assumptions about compositionality are not justified. The major criticism is that these accounts do not explain the relationship of unconditionals to "if"-conditionals in any deep way. The analysis developed in chapter 3 builds in certain components of the analyses presented below, and I will also make clear what the benefits of the analyses are.

Finally, I discuss two general problems that apply to a large range of potential analyses of unconditionals, including some of the existing analyses. One of these problems is that many obvious treatments of unconditional adjuncts make the effect of the adjunct on the interpretation of the main sentence vacuous. (This fact was first noted by Klinedinst 2004; though there it was not considered in light of competing analyses.) The second problem is specific to counterfactuals; this is the famous problem of disjunctive antecedents (Nute 1975; Alonso-Ovalle 2006; Klinedinst 2007 among others). Previous literature discusses this problem only in the context of "if"-counterfactuals, but I show that it generalizes to counterfactual unconditionals. Further, I show that for counterfactual unconditionals, it is a problem that can't be ignored. That is, for "if"-counterfactuals, the problem rears its head in a small set of cases, those involving disjunction. But every unconditional involves disjunction or a set of

alternatives. Therefore, an account of counterfactual unconditionals faces this problem in a very general way.

1.4.1 Zaefferer 1990, 1991

Zaefferer 1990, 1991 presents an analysis of unconditionals and conditionals in the situation semantics of Barwise and Perry 1983 (B&P). The analysis is basically non-compositional. There are significant differences in theoretical assumptions between Zaefferer's work and this dissertation, but for present purposes these can be abstracted away from and do not prevent useful comparisons. The technical details I present here are from Zaefferer 1990.

Conditional and unconditional sentences, for Zaefferer 1990, are first translated into unconditional "infons". Infons are pieces of information, and can also be thought of as types (Barwise and Perry 1983; Barwise 1989; Barwise and Etchemendy 1990). Some infons are basic and constructed out of relations and arguments, and some infons are constructed out of basic infons. Effectively, the infons that are not basic serve as intermediate logical representations for certain syntactic structures. In some cases, such structures can be linguistically complex; there is a conditional infon "*if* $\sigma(\tau)$", and two unconditional infons "*x-ever* $\sigma(\tau)$" and "*whether* $\Sigma(\tau)$". It is for this reason that the account is not compositional, in that it does not try to give any semantic decomposition of these complex structures. I will focus on the disjunctive case here; the "wh-ever" case is basically the same. A side issue of the lack of compositionality is that, aside from the end results of the derivations, there is no linguistic connection between conditionals and unconditionals. That is, at no stage until the final truth-conditions are the two constructions related. Another way of putting this is that Zaefferer 1990 linguistically takes there to be two different constructions, conditionals and unconditionals, and assumes that their semantics should be defined on a construction by construction basis. Actually, on this account, alternative unconditionals are as different from constituent unconditionals as they are from "if"-conditionals, linguistically. Each construction corresponds to one sort of infon.

I turn now to the details of the semantics. First, I discuss the truth-conditions for "if"-conditionals and unconditionals in this system. This can be most easily done without reviewing all the technical details of this framework by looking at the two definitions side by side. I will not discuss the formal details of the B&P semantics in depth, as they are by and large orthogonal to the analysis of unconditionals, and they are also more intuitive than they might appear.

There are still a few details that must be reviewed. *Sup* and *dec* stand for "support" and "decide" respectively. A situation decides an infon if it is rich enough to determine that infon positively or negatively. If it determines it positively, it supports that infon. A situation anchor is a function from the parameters of an infon to the constituents of a situation. An *i*-frame stands for "indicative frame" and, given a topic situation and a set of alternative situations I, provides a subset of I that includes the topic situation. This can be thought of as an accessibility relationship, and limits the domain of quantification given the topic situation. The set I, together with its pre-order, constitute what Zaefferer calls the "virtual discourse

background", and represent the issues that are live in the discourse.

(79) $\langle (s \text{ sup } \textit{if } \sigma(\tau)), I, \leq_t \rangle$ is true iff

$$\forall s' \forall f \left[\begin{array}{lll} & s' \in \text{i-frame}(s, I) \\ \& & f \in s'\text{-anchors}(\textit{if } \sigma(\tau)) \\ \& & s' \textit{ sup } \sigma[f] \\ \& & s' \textit{ dec } \tau[f] \end{array} \right] : s' \textit{ sup } \tau[f]$$

(80) $\langle (s \text{ sup } \textit{whether } \Sigma(\tau)), I, \leq_t \rangle$ is true iff

$$\forall s' \forall f \left[\begin{array}{lll} & s' \in \text{i-frame}(s, I) \\ \& & f \in s'\text{-anchors}(\textit{whether } \Sigma(\tau)) \\ \& & \exists \sigma \in \Sigma : s' \textit{ sup } \sigma[f] \\ \& & s' \textit{ dec } \tau[f] \end{array} \right] : s' \textit{ sup } \tau[f]$$

The basic idea of the "if"-conditional definition is that a (topic) situation supports a conditional infon just in case for all situations containing the topic situation (by means of the *i*-frame function), that also support the antecedent and contain enough information to decide the consequent one way or the other, these situations support the consequent. Abstracting away from the specific framework and analysis of conditionals, this is quite similar to e.g. Kratzer 1989/Heim 1990: every appropriate situation that makes the antecedent true also makes the consequent true. The only difference between conditional and unconditional is that in the case of the unconditional, disjunction provides us with a set Σ of alternative infons, and we may choose from any of the alternatives to find one that is supported by the situations we examine.

Infons can also come with conditions of appropriateness for their use. These are where Zaefferer captures the anti-exhaustiveness and exhaustiveness effects of conditionals and unconditionals respectively. (See §1.3.6.)

(81) A discourse contribution with propositional content
$(s \textit{ sup } \textit{if } \sigma(\tau))$
is appropriate on a virtual background $\langle I, \leq_I \rangle$ iff

$$\neg \forall s' \forall f \left[\begin{array}{lll} & s' \in \textit{i-frame}(s, I) \\ \& & f \in s'\text{-anchors}(\textit{if } \sigma(\tau)) \end{array} \right] : s' \operatorname{sup} \sigma[f]$$

(82) A discourse contribution with propositional content
$(s \textit{ sup } \textit{whether } \Sigma(\tau))$
is appropriate on a virtual background $\langle I, \leq_I \rangle$ iff

$$\forall s' \forall f \left[\begin{array}{lll} & s' \in \textit{i-frame}(s, I) \\ \& & f \in s'\text{-anchors}(\textit{whether } \Sigma(\tau)) \end{array} \right] : \exists \sigma \in \Sigma : s' \operatorname{sup} \sigma[f]$$

The appropriateness conditions for "if"-conditionals state that there is some situation containing the topic situation, relative to the *i*-frame given by I, that does not support the antecedent. That is, the antecedent does not cover all the cases in the context; it isn't exhaustive. The appropriateness conditions for unconditionals say the opposite, that for every case that is a

possibility in the context, some alternative introduced by the "whether"-adjunct is supported by that case.

How does this analysis fare with respect to the semantic and pragmatic properties discussed earlier in this chapter? It seems to describe the indifference implication in an appropriate way – by universal quantification over alternatives. It also describes the exhaustiveness effect. It is not clear what the relationship with a plain modal sentence would be, since Zaefferer does not discuss plain modal sentences (at least in this work). It is also not clear that this analysis explains the discourse effects outlined earlier. Finally, the connection to "if"-conditionals is quite weak, though a connection is made by the truth-conditions. There is no linguistic connection to "if"-conditionals, and so there is no explanation of why the truth-conditions of the two constructions would be so similar. In summary, Zaefferer 1990, 1991 provides a solid description of certain key properties of unconditionals, but doesn't provide a linguistic explanation of these properties.

Benefits	Problems
Plausible truth-conditions	non-compositional
Exhaustiveness presupposition	no linguistic connection to conditionals
	no (obvious) explanation of discourse effects

Table 1: Evaluation of Zaefferer's analysis of unconditionals

1.4.2 *Wulun* conditionals

"Wulun" conditionals in Mandarin Chinese look like a kind of unconditional construction. They have received some attention in the semantics literature, and in this section I discuss two analyses of this construction, and their relation to my analysis of English unconditionals.

Lin 1996 Lin 1996 offers a compositional analysis of the Mandarin Chinese "wulun" construction. While the differences between that and the English "no matter" construction (the closest correlate) are enough to make Lin's analysis not directly applicable to English, the analysis could be modified to apply to English, and contains several important ideas that have influenced the analysis I present here.

The "wulun" construction encompasses two versions: a version with "wulun", which is conventionally translated to "no matter", and a bare version: (from Lin's ch.3 ex. 4a)

(83) (wulun/buguan) ni zuo shenme, wo dou mei yijian
no.matter you do what, I all not opinion
No matter what you do, I won't have an opinion.

"Wulun" takes a question clause, and the bare version consists of just this clause. Lin proposes (following others) that the bare version involves an elliptical "wulun". In the terms I have been using here, this would amount to assuming a covert unconditional or concessive operator that

is present in the bare forms. While in English there are clear syntactic differences between the headed and bare forms – enough to make it clear that there is no close relation, these differences presumably are not present in Chinese. (However, I don't know of any detailed investigation of this question along the lines I develop for English in chapter 2; and Lin does not settle the issues I mention here with respect to Mandarin Chinese.) In particular, English only requires a semantic question, including even concealed questions, in the complement of "no matter" and "regardless"; a bare constituent unconditional in English (e.g. a "wh-ever" adjunct) must be syntactically an interrogative clause, and bare adjoined concealed questions are not allowed.[7]

(84) No matter the results of the election, the next president will have a difficult time.

(85) * The results of the election, the next president will have a difficult time.

English headed unconditionals also allow polar interrogatives, which cannot be adjoined without a licensing head. Finally, "-ever" is in complementary distribution with the heads in headed unconditionals, the opposite of what we expect, on a covert "no matter" analysis.

(86) No matter whether Alfonso comes to the party, it will be fun.

(87) * Whether Alfonso comes to the party, it will be fun.

(88) No matter who(*-ever) comes to the party, it will be fun.

(89) * Who comes to the party, it will be fun.

Consequently the covert "no matter" analysis can't apply to English; while headed and non-headed unconditionals have similar meanings, the internal structures of the adjunct (in terms of what is licensed in those positions) are substantially different. An analysis of English where all unconditionals involve a covert "no matter" head, following Lin's analysis of Chinese, would overpredict the adjuncts that can adjoin. There is, of course, the possibility of a more abstract covert operator contributing the same meaning, but because of the distinctions between English bare unconditionals and headed unconditionals, such an analysis is not motivated for English and would remain a stipulation.

A further substantial difference between English unconditionals and Chinese "wulun" adjuncts is that in Chinese, the adverbial "dou" is obligatorily present in the main clause with one of the relevant adjuncts. Without "dou", the whole sentence would be ungrammatical. In English of course, there need be no item in the main clause to license the unconditional adjunct.

Yet another difference is that the "wulun" clauses can appear in argument position as well. This is cross-linguistically common for "no matter" constructions (Haspelmath 1997), but not true of the English form, though of course "wh-ever" free relatives are closely related to English unconditionals.

[7] Lin 1996 does not discuss whether the presence of "wulun" might license concealed questions in Chinese, but the prediction of the analysis at least is that it does not.

The internal semantics of the "wulun" adjunct, on Lin's 1996 account, rely on both the interrogative morphology, and a semantics specific to "wulun". Lin 1996 makes assumptions about the role of interrogative semantics in composition similar to what I assume in this dissertation. Interrogatives denote Hamblin sets of alternatives. For Lin, "wulun" (both the overt and the covert form) denotes a generalized union operator. This operator collects Hamblin alternatives that are propositions (sets of situations) and takes their union, forming a single set of situations. For example, "wulun shei lai", Eng. "no matter who comes", will denote: (repeated from Lin's ch.3 ex. 40)

(90) $[\![\textbf{wulun shei lai}]\!]$
$= \{s : \exists p(p \in \{q : \exists x[\text{person}'(x) \,\&\, q = \text{left}'(x)]\}) \,\&\, s \in p\}$
$= \{s : \exists p \exists x[\text{person}'(x) \,\&\, p = \text{left}'(x) \,\&\, s \in p\}$

This formula gives a set of situations s such that there is some proposition where someone left, and s is a member of that proposition. Any part of any leaving situation will be contained. It is formed off a set of alternative propositions of leaving, one for each person in the domain. The generalized union operator is quite similar to the Hamblin existential operator in Kratzer and Shimoyama 2002, except that it produces a proposition instead of a singleton set containing a proposition.

The external semantics for "wulun" adjuncts assumed by Lin is a conditional semantics based on Heim 1990 – introducing universal quantification over minimal situations. The function of "dou" in this construction is to distribute over the set of situations given by the antecedent. The semantics for the whole construction is given below (Lin's ex. 44):

(91) [["wulun" α] "dou"-β] is true in a situation s iff the following holds:
$\forall \min_s[s \in \bigcup [\![\alpha]\!] \rightarrow \exists s'[s \leq s' \,\&\, s' \in [\![\beta]\!]]]$

Paraphrased, this says that for every minimal situation s in the generalized union of the antecedent, there is some situation that is an extension of s and makes the consequent true. (There is some confusion about which s means what here but I will set that aside.)

In summary, though Lin's analysis cannot be applied directly to English, it contains some important ideas. These are the use of a Hamblin semantics for interrogatives, and the conditional treatment of "wulun" adjuncts.

Giannakidou and Cheng 2006 Giannakidou and Cheng 2006; Cheng and Giannakidou to appear propose a different analysis of the "wulun" construction, based on work on free choice in Greek. Like Lin, they assume that the bare unconditionals in Chinese contain a covert "wulun". Both "wulun" and "dou" serve a different function on their analysis, however. The function of "wulun" is to take a property, and ensure that an intensional argument position remains open. They also suggest that it provides a presupposition of exhaustive variation.

The function of "dou" is that of an intensional iota operator; it provides a maximality presupposition. The end result is that a "wulun"-clause is going to intensionally vary over maximal entities that satisfy the content of the clause. Cheng and Giannakidou to appear

assumes a conditional treatment (following Lin, as well as Cheng and Huang 1996) of the construction, for purposes of NPI licensing, though they do not discuss the composition of the "wulun" clause with the consequent. This approach gives a result very similar to Lin's end result, but it is derived in a way that makes closer parallels to Giannakidou's work on Greek.

This is a nominal-like treatment of unconditionals; in that respect it is similar to Gawron 2001, discussed below. As such it will stand or fall depending on how syntactically viable a nominal treatment of unconditionals is. In chapter 2 I show that such a treatment is not viable for English. A Chinese-English difference is suggested by the fact that "wulun" clauses can appear in argument position. Another way of thinking about this distinction is that Cheng and Giannakidou's analysis makes Chinese "wulun" adjuncts look more like correlative structures, whereas the English unconditionals clearly aren't correlative structures. More work on the syntactic differences between English and Chinese unconditionals remains to be done.

It is also worth noting that the analysis presented in Giannakidou and Cheng 2006; Cheng and Giannakidou to appear does not obviously apply to "wulun" adjuncts that do not contain constituent interrogatives; see e.g. Lin 1996 ch. 3 ex. 6 for data of this kind. Lin's analysis applies straightforwardly, because of the use of interrogative semantics. In English it is also true that we find alternative interrogatives in unconditional structures, and in headed unconditionals, we find interrogative clauses of all types. A nominal/correlative analysis will not directly apply to these cases. It is possible that by analogy between the nominal and propositional domains we could apply such an analysis; Gawron 2001, discussed below, makes implicit use of a strategy of this sort, treating alternative unconditional adjuncts as nominal structures (see chapter 2 for more discussion of this possibility; I conclude there that it is not motivated).

1.4.3 Analyses of constituent unconditionals as free relatives

Dayal 1997 Dayal 1997 is one of the foundational papers in the study of the semantics of "-ever" free relatives (FRs). At the end of the paper, Dayal makes a proposal for extending the analysis of "-ever" free relatives to constituent unconditionals, on the assumption that they involve an adjoined free relative structure.

Dayal's proposal for "-ever" (for further discussion see also von Fintel 2000; Caponigro 2003; Tredinnick 2005) is that "-ever" introduces quantification over "i-alternatives". The intuition behind an i-alternative is that it is an alternative possible world to the actual one, corresponding to a way in which the individual denoted by a free relative can vary (cf. the treatment of attributive DPs in Farkas 1982.) While von Fintel 2000 demonstrates some technical problems with Dayal's formulation, I think the intuition that "-ever" triggers something like intensional quantification is sound, and this intuition remains in several of von Fintel's reformulations, as well as most analyses of "-ever" free relatives following Dayal.

Compositionally, Dayal assumes that "-ever" results in a generalized quantifier type for "-ever" FRs. This is the stepping off point for the proposal for unconditionals:

> Since "ever" introduces a set of worlds into the interpretation procedure, I suggest that in addition to yielding generalized quantifier meanings it also yields condi-

tional meanings $\lambda p \lambda q \forall$i-alt $\in f(w)(s)\,[p(i) \rightarrow q(i)]$... (Dayal 1997 p. 114)

Here p is the content of the antecedent, and q is the consequent. The function f is a doxastic modal base, w is a free world variable not bound by tense or aspect, and s is the speaker. The truth conditions this results in are quite similar to those derived by other conditional-based accounts that I discuss in this chapter. This proposal is different from many others in that it provides a first step toward a cross-categorial analysis of "-ever"; on this analysis constituent unconditionals and "-ever" FRs are unified by quantification over i-alternatives.

However, there are several problems. First, the analysis rests on the assumption that constituent unconditional adjuncts are free relatives, and that the two constructions should be unified on that basis in particular. We will see in chapter 2 that this is not right. The goal of giving a unified account of "-ever" is still sound, and I will return to this goal in chapter 4, but a unified semantics for the two kinds of clauses would be too strong. Second, the analysis is not truly compositional, in that we have in effect a rule of interpretation for constituent unconditionals. On this note, it does not involve any linguistic connection between unconditionals and conditionals (similarly to Zaefferer 1990, 1991), and there is also no connection to alternative unconditionals. Third, it is not obvious why the ambiguity that Dayal proposes, between a generalized quantifier interpretation and a conditional approach, should hold. That is, there is no general principle that I know of that will perform the necessary type shift, and so we must assume a lexical ambiguity. But it is not clear that "-ever" is ambiguous in this way – it seems rather that it has a similar effect in different kinds of clauses. Dayal's proposal is an interesting first step, but much more work needs to be done.

Izvorski 2000 Izvorski 2000a,b provides a discussion of constituent unconditionals also starting from Dayal's 1997 assumption that they involve an adjoined free relative. Izvorski's discussions are mostly from a syntactic perspective; the main questions Izvorski raises have to do with the syntax of "-ever" free relatives. As such the paper does not present a compositional semantic analysis of unconditionals. I deal with Izvorski's syntactic concerns in more detail in chapter 2. However, Izvorski discusses several ideas that are important to my analysis.

The first of these is that a "wh-ever" adjunct has an interrogative semantics of some kind (despite the fact that, on Izvorski's account, the structure is a free relative). This is what leads to quantification over alternatives. The second of these ideas is that unconditional adjuncts are "weak" adjuncts in the sense of Stump 1985. That is, they serve as conditional-like adjuncts despite the lack of "if" in the sentence. Both of these ideas will form a part of the analysis developed in chapter 3.

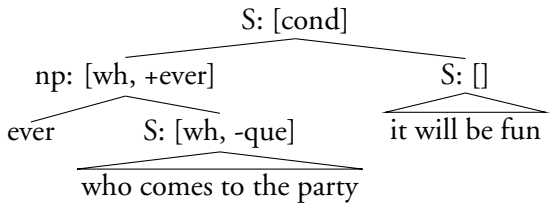
Note also that Izvorski 2000b deals in much detail with types of unconditionals that do not involve interrogative morphology, but instead involve subjunctive marking on the clause. I do not deal with such cases for the most part in this dissertation.

1.4.4 Gawron 2001

In this section I discuss the analysis of unconditionals developed in Gawron 2001. Gawron 2001 provides comprehensive discussion and analysis of unconditionals[8], and this section will focus on the truth-conditions the analysis derives, and the way in which it derives them. The ideas and analysis in this paper have been highly influential on other parts of this dissertation as well, and I will return to discussing this analysis at several later points.

***wh-ever* unconditionals** The syntactic structure for an unconditional assumed by Gawron 2001 is shown in (92). Each node is introduced by a construction-specific rule. An unconditional adjunct is a noun phrase, and "ever" serves as a sort of determiner that takes as its argument what Gawron calls a "pre-question". This is the denotation of an interrogative clause before it gets turned into a full-on question meaning. Technically, it is the proposition or property used to form a partition on the set of worlds in the sense of Groenendijk and Stokhof 1984.

(92)



The denotation of a pre-question like "who comes to the party" is:

(93) $[\![$**[S: [wh, -que]] who comes to the party**$]\!]=$
$\lambda i_s \,.\, \lambda x_e \,.\, \text{person}(i)(x) \wedge \text{comes-to-the-party}(i)(x)$

This is a simple (intensional) predicate that picks out people who came to the party. In order to turn this into a question, we re-abstract over the world parameter and test for equality, inducing a partition:

(94) $[\![$**[S: [wh, +que]] who comes to the party**$]\!]=$
$$\lambda i_w \,.\, \lambda j_w \,.\, \left[\left(\lambda x_e \,.\, \begin{array}{l} \text{person}(i)(x) \\ \wedge \quad \text{comes-to-the-party}(i)(x) \end{array} \right) = \left(\lambda x_e \,.\, \begin{array}{l} \text{person}(j)(x) \\ \wedge \quad \text{comes-to-the-party}(j)(x) \end{array} \right) \right]$$

This is an equivalence relation on worlds that puts two worlds in the same cell of a partition just in case the sets of people who come to the party on those worlds are the same set (see Groenendijk and Stokhof 1984 for more detail). Each cell of the partition corresponds to a complete answer to the question; this is the standard partition theory of questions.

In an unconditional re-abstraction and testing of equality is not what happens. The pre-question is not used to induce a partition, but instead composes with "ever" to build a noun phrase meaning. The semantics Gawron 2001 assumes for "ever" is given here (∂ is a presupposition operator as in Beaver 1992):

[8] Gawron 2001 uses the name "Universal Concessive Conditionals", following König 1986.

(95) $[\![\textbf{ever}]\!] = \lambda P_{\langle s\langle et\rangle\rangle} . \lambda Q_{\langle s\langle et\rangle\rangle} . \lambda i_s . P(i)(x) \wedge Q(i)(x) \wedge \partial(\Pi(P, Q, x))$

Note the free variable x; it is not entirely clear from the text or formulas how this is supposed to work, but it seems that it is later bound by the conditional operator. The Π operator imposes an ordering on elements in the domain (the property P), such that x is the minimum on the scale ordered by Q. That is, for any y in the domain, if Q is true of x, then it is also true of y. Truth conditionally "ever" doesn't do much, though it is crucial to the analysis that it takes something of type ⟨s⟨et⟩⟩ and gives back something of type ⟨⟨s⟨et⟩⟩t⟩. The antecedent in the example derivation gives:

(96) $[\![[\textbf{np: [wh, +ever] ever who comes to the party}]]\!] =$

$$\lambda Q_{\langle s\langle et\rangle\rangle} . \lambda i_s . \begin{pmatrix} & \text{person}(i)(x) \\ \wedge & \text{comes-to-the-party}(i)(x) \\ \wedge & Q(i)(x) \\ \wedge & \partial\left(\Pi\left(\left(\lambda i_w . \lambda x_e . \begin{array}{ll} & \text{person}(i)(x) \\ \wedge & \text{comes-to-the-party}(i)(x) \end{array}\right), Q, x\right)\right) \end{pmatrix}$$

This denotation may seem relatively opaque at this point, but it can be thought of as an indefinite denotation in the sense of Heim, i.e. a restricted free variable. It additionally introduces a presupposition that the variable is at the endpoint of a scale imposed on the domain of people who came to the party, ordered by the as-yet undetermined property Q.

The next step is to combine the adjunct with the main clause. This is done with a rule specific to S nodes with the [cond] feature:[9]

(97) $[\![[\textbf{S: [cond] [np: [wh, +ever] } \alpha\textbf{] [S } \beta\textbf{]}]]\!] = [\![\alpha]\!](P_0)(s) \Rightarrow_{\{s,x\}} [\![\beta]\!](s)$

The $\Rightarrow$ operator is a conditional operator following Heim 1982, in that it unselectively binds free variables. The subscripts here mark that it binds the situation variable and an individual variable, and that it quantifies over them. The P_0 is a contextually provided property which is used to order the scale involved in the interpretation of "ever".

We can now plug in for R and p to complete the example I have been deriving:

(98) $[\![\textbf{Whoever comes to the party, it will be fun}]\!] =$

$$\begin{pmatrix} & \text{person}(s)(x) \\ \wedge & \text{comes-to-the-party}(s)(x) \\ \wedge & P_0(s)(x) \\ \wedge & \partial\left(\Pi\left(\left(\lambda i_w . \lambda x_e . \begin{array}{ll} & \text{person}(i)(x) \\ \wedge & \text{comes-to-the-party}(i)(x) \end{array}\right), P_0, x\right)\right) \end{pmatrix} \Rightarrow_{\{s,x\}} \text{the-party-is-fun}(s)(y))$$

Assuming a default universal force for conditionals, the non-presuppositional component of this formula can be paraphrased as "for any situation s and individual x s.t. x comes to the

[9] Note that I have changed the order of function-argument application for α to fix what seems to be a typo in the original.

party in s and the contextual property holds of x, the party will be fun in s." The presupposition that should project (as far as I can tell) is that every choice of x we are considering is equally unlikely – that is, each choice of x should be presupposed to be a minimum point on the scale imposed on the domain by P_0. It is not clear from the prose that this is what is intended, and I will return to this issue below. First, I will discuss the analysis of alternative unconditionals.

Alternative unconditionals Compositionally, alternative unconditionals work the same way as constituent unconditionals. To get this to work, Gawron 2001 revises the standard Groenendijk and Stokhof 1984 semantics for alternative questions in a clever way; this revision also distinguishes them interestingly from polar questions. The normal G&S semantics for alternative questions looks like this:

(99) $[\![$**whether Alfonso or Fruela brings the beer**$]\!] =$

$$\lambda i_s . \lambda j_s . \begin{pmatrix} & (\text{brings-beer}(i)(a) = \text{brings-beer}(j)(a)) \\ \wedge & (\text{brings-beer}(i)(f) = \text{brings-beer}(j)(f)) \end{pmatrix}$$

This denotation gives a partition on worlds which makes the worlds agree on who brought the beer. Note that this does not impose a bipartition on D_s – rather, there will be four cells in the partition. This is because there may be worlds where no one brought beer, and worlds where both Alfonso and Fruela brought beer.

The problem Gawron 2001 faces is that it is difficult to see what kind of pre-question meaning one could give that would work with the noun phrase semantics for "ever". Gawron revises the semantics for disjunction in alternative questions to give translations that are equivalent to the standard G&S ones, but work with the question formation rules. There are two kinds of revisions given, for disjunctions of noun phrases, and disjunctions of propositions. However, I will only present the case for disjunctions of propositions, which as far as I can tell is completely general and makes the other case unnecessary. (This is important, since it is hard to see how to derive the other case in a general way.) First, the semantics above for an alternative question is revised to:

(100) $[\![$**[S: [wh, +que] Alfonso or Fruela brings the beer]**$]\!] =$

$$\lambda i_s . \lambda j_s . \left[\left(\lambda p_{\langle st \rangle} . \begin{pmatrix} & p = \lambda i_s . \text{brings-beer}(i)(a) \\ \vee & p = \lambda i_s . \text{brings-beer}(i)(f) \end{pmatrix} \wedge p(i) \right) = \left(\lambda p_{\langle st \rangle} . \begin{pmatrix} & p = \lambda i_s . \text{brings-beer}(i)(a) \\ \vee & p = \lambda i_s . \text{brings-beer}(i)(f) \end{pmatrix} \wedge p(j) \right) \right]$$

The basic observation is that this is much closer to the denotation of a constituent interrogative than the standard G&S denotation for alternative questions. The main difference is that instead of comparing characteristic functions of sets of individuals, it compares characteristic functions of sets of propositions. The equality comparison in the above formula produces results identical to the standard semantics; the partition induced is identical. The reason for the modification is that it is much easier to provide a sensible pre-question meaning:

(101) $[\![$[S: [**wh, -que**] **Whether Alfonso or Fruela brings the beer**]$]\!]=$

$$\lambda i_s . \lambda p_{\langle st \rangle} . \begin{pmatrix} & p = \lambda i_s . \text{brings-beer}(i)(a) \\ \vee & p = \lambda i_s . \text{brings-beer}(i)(f) \end{pmatrix} \wedge p(i)$$

Another advantage of this denotation is that it is much more transparently disjunctive than the standard denotation. In fact, it is effectively a Hamblin analysis of alternative interrogatives, though one in the spirit of Karttunen 1977a and not the system I use here. The denotation of an alternative pre-question is a set of propositions, and it will give rise to four alternatives: one for each of the disjuncts, one where neither of the disjuncts is true, and one where both are true. The question formation rule forms an equivalence relation from this denotation. Continuing the parallel with a Hamblin semantics for alternative questions, the behavior of the question formation rule in this case is very similar to the Groenendijk and Stokhof style Q operator in Kratzer and Shimoyama 2002.

When used in an unconditional, this denotation will combine with "ever". That is, Gawron 2001 assumes that "whether" + "-ever" = "whether", and that this morpheme is always covertly present in an alternative unconditional. We also must assume (though Gawron does not discuss this) that "ever" is type-agnostic, as is the Π operator. Gawron does explicitly assume that such "whether"-clauses are nominal.[10]

(102) $[\![$[**np: [wh, +ever] Alfonso or Fruela brings the beer**]$]\!]=$

$$\lambda Q_{\langle s\langle\langle st\rangle t\rangle\rangle} . \lambda i_s . \begin{pmatrix} & \begin{pmatrix} & p = \lambda i_s . \text{brings-beer}(i)(a) \\ \vee & p = \lambda i_s . \text{brings-beer}(i)(f) \end{pmatrix} \\ \wedge & p(i) \\ \wedge & Q(i)(p) \\ \wedge & \partial\left(\Pi\left(\left(\lambda i_s . \lambda q_{\langle st \rangle} . \begin{pmatrix} & q = \lambda i_s . \text{brings-beer}(i)(a) \\ \vee & q = \lambda i_s . \text{brings-beer}(i)(f) \end{pmatrix} \wedge q(i)\right), Q, p\right)\right) \end{pmatrix}$$

Where p is a free propositional variable.

What this gives us, instead of a restricted free variable over individuals, is a restricted free variable over propositions. The proposition is restricted to be one of the alternative propositions introduced by disjunction. This then combines with the conditional operator, which binds the propositional variable, and quantifies over the alternatives. I won't spell out the details here, as it works the same as the constituent unconditional case; the final presupposition that seems to project from the Π operator is that each alternative is equally unlikely. This arises, just as in the earlier case, since each choice of p will lead to a presupposition that that proposition is the minimum point on the scale of propositions.

Discussion First, I discuss the compositional aspects of this analysis. The syntax is not obviously the right analysis; it is somewhat idiosyncratic. I return to this issue after discussing the syntax in more detail in chapter 2. The syntax and semantics are construction specific –

[10] The evidence is on their appearing in argument position, including as subject. However, it is well known that clausal subjects do not pattern with nominals. For example, they trigger default agreement.

though the details of composition are much more developed than in Zaefferer 1990, in the end, much of the work comes down to a construction-specific rule for unconditionals. This is the rule for interpretation of [S: [cond]]. Gawron 2001 acknowledges this, and suggests that a more general treatment of conditionalization is desirable. It is this suggestion that I follow up on in chapter 3.

The truth conditions that Gawron 2001 develops, despite the differences in framework, are quite similar to those of Zaefferer 1990. An unconditional is a conditional-like construction that quantifies over alternatives introduced in the antecedent. This captures the indifference implication (in some sense; see below) and the consequent entailment facts.

This account captures neither the exhaustiveness effects nor the distribution effects discussed in the previous section, and it is not obvious that the account makes any predictions about the behavior of unconditionals in discourse. The lack of exhaustiveness will lead to problems in the case of alternative interrogatives, where the exhaustiveness presupposition states that no other options are live possibilities. In particular, with an unconditional like "Whether Alfonso or Fruela brings the beer, the party will be fun", we do not want to consider cases where neither brings the beer.

It is not clear that the scalar presupposition comes out as intended in Gawron 2001. The prose in §4 of that paper suggests that unconditional adjuncts are meant to be referential, denoting the endpoint on a scale. However, as long as the conditional operator is quantificational, has universal force, and binds the variable x, this cannot be the presupposition that actually projects. The presupposition that projects is that each instance of x is the least likely, and therefore that they are all equally unlikely according to the contextually provided scale. This does not accord with intuitions about the meaning of unconditionals.

Gawron 2001 suggests that an unconditional does not always have universal force; one case is in examples like (103):

(103) Whatever John is standing on, it will collapse soon

In this case, assuming non-universal force, the presupposition will project correctly, as the antecedent will only be instantiated for one value of x (Gawron is assuming an existence presupposition, as well). The correct paraphrase, given my reading of Gawron 2001, is "there is something that John is standing on, and it is the least likely element on some pragmatic scale, and it will collapse soon." However, my intuitions do not agree with the presupposition in this case. It is not that John is standing on the least likely thing relative to some scale, but rather that the speaker does not know what John is standing on. This to me suggests that quantification is still universal, but over alternative options for things that John could be standing on in the actual world. The assumption that unconditionals can receive existential force is also problematic for alternative unconditionals; since there is no case where it is even plausible that these involve existential quantification over the alternatives mentioned.

There is an intuition about scales in unconditionals that I think is correct, and perhaps is what this analysis aims to capture. When looking at alternatives, we must consider everything up to very unlikely possibilities, though we may also consider likely possibilities. For example, in (103), we have to consider unlikely possible identities of the object that John is standing on.

Overall, Gawron 2001 is a step forward from Zaefferer 1990, and it is much more comprehensive, but there are still several aspects that could be improved.

Benefits	Problems
Compositional	Implausible syntax
Good truth conditions	Construction-specific syntax and semantics
Hamblin-like disjunction	No distribution or exhaustiveness presuppositions
	No linguistic connection to conditionals
	Scalar semantics for "-ever"

Table 2: Evaluation of Gawron's 2001 account of unconditionals

1.4.5 The domain expansion problem

Depending on the details of the theory of conditionals, any analysis that adopts a conditional theory of unconditionals is susceptible to what I will call the "domain expansion problem." This includes Gawron 2001, Dayal 1997, and potentially Lin 1996 and Cheng and Giannakidou to appear. Zaefferer 1990 does not seem to be susceptible to this problem, though a similarly constructional approach with different assumptions about conditionalization would be. Simply put, the problem is that because of the way conditionals work in many theories, the contribution of an unconditional adjunct can easily turn out to be vacuous. If it is vacuous, the indifference implication cannot be derived as a truth-conditional effect, because an unconditional will be truth-conditionally equivalent to a plain non-unconditionalized sentence.

The simplest version of the problem would arise on a classical translation of any analysis that involves an exhaustive conjunction of conditional formulas. For instance, consider $(p \rightarrow q) \wedge (\neg p \rightarrow q)$. This is equivalent to plain q.[11] Similarly, $(p \vee \neg p) \rightarrow q$ is equivalent to q. This classical equivalence has been noted before in the context of unconditionals; Klinedinst 2004 makes use of the vacuity to argue for a pragmatic analysis. The fact that the unconditional's effect would be vacuous leads to the indifference implication in the form of a conversational implicature. I have argued earlier that the indifference implication is not an implicature, which suggests that an implicature approach is not right. This problem goes hand in hand with deriving consequent entailment – it is very easy to derive consequent entailment with a vacuous conditional claim. The puzzle is that an unconditional sentence conveys something over and above its consequent, and a vacuous conditional claim cannot derive this without resorting to an implicature-based approach.

A version of this problem can also arise on a non-classical account of the conditional operator. For instance, consider the analysis in Kratzer 1981, 1986. The conditional adjunct serves to restrict the domain of an operator in the main clause. This restriction is done by taking

[11] $(p \rightarrow q) \wedge (\neg p \rightarrow q)$
$= (\neg p \vee q) \wedge (p \vee q)$ (by material implication)
$= q \vee (\neg p \wedge p)$ (distribution)
$= q$ (neg. of excluded middle)

the intersection of a set of worlds in a conversational background (at the world of evaluation) with the proposition denoted by the conditional adjunct. If the conditional adjunct denotes $p \vee \neg p$ or some other exhaustive proposition, the conditional adjunct will denote the entire set of worlds. Consider the interpretive scheme for "if"-conditionals in Kratzer 1981 (p. 68; substantial editing for clarity):

> Consider an utterance of a sentence of the following form:
>
> (if α), (then modal . . .)
>
> . . . Suppose that the proposition p is expressed by the utterance of α.
>
> . . .
>
> (ii) If f is the modal base and g the ordering source [used in the interpretation of the "if"-clause], then f^+ is the modal base and g the ordering source [used in the interpretation of the main clause.] f^+ is that function from possible worlds to sets of propositions, such that for any world w, $f^+(w) = f(w) \cup \{p\}$.

The important sentence is the last one. f (a conversational background) at some world is intuitively a set of premises/background information that is provided by the context. We extend this set of premises with the new premise explicitly introduced by the "if"-clause to form f^+. Then, the interpretation of the modal in the main clause makes use of the extended premise set/conversational background. How does it make use of it (see pp. 47-8)? By taking the intersection of all the premises at the world of evaluation: $\bigcap f^+(w)$. Let us suppose that p is an exhaustive proposition – e.g. $q \vee \neg q$. Introducing p to the conversational background has no effect on the eventual result. f^+ at any particular world will be different from f, since it has this extra proposition. But the intersection of the propositions in the premise set will remain the same, since any proposition intersected with p will return itself. Therefore, introduction of an exhaustive proposition into a conversational background, where restriction is modeled with set intersection, will lead to a vacuous restriction.

It is clear that exhaustiveness is an important component of the meaning of unconditionals, so getting rid of it will not be the solution to this problem. Gawron 2001 is theory-neutral about the details of conditionals, but this vacuous restriction is what we'd expect to happen if that analysis is combined directly with Kratzer's analysis of conditional domain restriction; the denotation of an unconditional adjunct on that account amounts to an exhaustive set of worlds. The generalization about the problem is this: *if we collect alternatives in the unconditional adjunct, we get a proposition that characterizes the existing domain of quantification*. In many cases, this proposition is simply the characteristic function of $\mathcal{W}$.

Even if we are using partial worlds, i.e. situations, the problem remains – the antecedent would denote a set of situations that exhaust the parts of worlds that would be relevant to the interpretation of the conditional. Therefore, given that a Heim 1990-style treatment of conditionals involves implicit domain restriction not described in the formula[12], the truth-

[12] Though Heim 1990 does provide explicit discussion of this issue

conditions used in Lin 1996 for "wulun" conditionals also seem to be susceptible to this problem (though this may depend on exactly how the situation minimality operator works). So while this is not a criticism of Gawron 2001 and other previous accounts per se, it is a criticism of the most obvious ways of filling in the theory of conditionals. In general, it is not so easy to see how to avoid this problem while using a standard domain-restriction theory at all.

There are two ways to avoid the domain expansion problem on an intensional semantics involving domain restriction. This problem could be avoided by assuming that unconditionals, unlike indicative "if"-conditionals, can expand the domain of intensional quantification (non-monotonically). In terms of the snippet of Kratzer's theory described above, we would have to change the way conversational backgrounds work so that set intersection is not used to combine the unconditional proposition with the rest of the premises in the background. Technically, this is tricky to accomplish.[13] The approach also does not seem right in principle, as (i) this is a power normally associated with counterfactual "if"-conditionals, and we don't seem to do true non-monotonic counterfactual expansion with typical unconditionals, and (ii) there are counterfactual unconditionals as well, that seem to work differently from indicative unconditionals (see discussion in the next section, as well as in chapter 3).

A better way to avoid the domain expansion problem is by not collecting alternatives in the antecedent into a single proposition. The intuition is that collapsing the alternatives into a single proposition (e.g. by Lin's 1996 generalized set union denotation for "wulun") loses information – the differences between alternatives. It is this loss of information that leads to the domain-expansion problem. No single alternative is vacuous by itself; it is only their union that is vacuous, and so if we can work on an alternative-by-alternative basis, there will be no domain expansion problem. The next question is how to sensibly make use of this information, and this I turn to in chapter 3.

1.4.6 The problem of disjunctive antecedents

There is an old problem about disjunctive antecedents to counterfactuals in a minimal change semantics. This is illustrated by the following example from Alonso-Ovalle 2007, which is itself adapted from an example in Nute 1975.

(104) If we had had good weather this summer or the sun had grown cold, we would have had a bumper crop.

A minimal change semantics for counterfactuals says, roughly, that we look at the closest worlds (by some measure of "close") to what actually happened where the "if"-clause proposition is true, and check whether the consequent proposition is true. The problem of disjunction is that it allows us to pair likely circumstances with unlikely circumstances in the same proposition. Intuitively, the conditional above is not true – because in the unlikely circumstances where the sun had grown cold, we would not have had good crops at all. However, because of the pairing

[13] The obvious, and ugly way to implement the idea would be to have some diacritic to mark propositions in the conversational background with whether they are restricting or unrestricting propositions. This is obviously no solution at all.

of likely and unlikely circumstances using classical disjunction, this is not what the minimal change semantics predicts. We will only consider the most likely worlds in the antecedent proposition, and therefore worlds where we had good weather. Therefore, the conditional above should come out true on this theory.

This problem potentially arises with counterfactual unconditionals as well. Let us assume that we actually had bad weather this summer.

(105) Suppose we didn't have that bad weather this summer. Whether we had had good weather or the sun had grown cold, we would have had a bumper crop.

If the unconditional antecedent were treated as a proposition expressing the disjunction of the two alternatives, we'd incur the same problem; a minimal change semantics would fail. Again, this is the most obvious way of filling in the analysis in e.g. Gawron 2001 discussed in the previous section. However, the scope of this problem relative to unconditionals is somewhat larger than with "if"-conditionals. For "if"-counterfactuals, the disjunctive antecedent problem problem is a sort of corner case. It is of course a very important corner case, and even one that has been taken to be a theory-breaker for the minimal change semantics, but still it is a problem that occurs only with a relatively small class of data. For alternative unconditionals that are counterfactuals, this problem would arise in every single example, except for rare and possibly nonexistent cases where the alternatives were exactly balanced in terms of likeliness.

The problem would also occur for constituent unconditionals, because the denotation of those would also amount to a disjunction of alternatives on this kind of theory, though not alternatives produced by disjunction. The following case illustrates this:

(106) Suppose we hadn't had that bad weather. Whatever had happened (instead), we would have had a bumper crop.

Intuitively, this seems to be a rather sweepingly false statement, though the judgment is perhaps a little hard, because it is very vague as to what could have happened. If the unconditional antecedent is treated as denoting a proposition amounting to a disjunction of alternative things that could have happened, we will be looking at a proposition that includes likely cases (good weather), as well as unlikely cases (death of the sun). The likely cases will make this come out to be true, though it should not be.

In summary, the problem of disjunctive antecedents is important for two reasons. The first is that, because of the nature of counterfactual unconditionals, the problem is completely pervasive. We simply cannot have an analysis of counterfactual unconditionals without having some solution or other in place. The second is that counterfactual unconditionals provide an interesting testing ground for theories that try to solve the problem of disjunctive antecedents. Certain theories (Alonso-Ovalle 2004, 2006, 2007) rely on an alternative semantics for disjunction. Since I will be using such a semantics in the analysis of unconditionals, these theories are a natural companion to my analysis. However, it will turn out that there are reasons to think that such an analysis of unconditionals is not compatible with an alternative-semantics solution to the disjunctive antecedent problem. I return to this issue following the presentation of my analysis of unconditionals, in chapter 3.

1.4.7 Summary of analyses and problems

There are two core ideas about unconditionals that have been discovered independently by several authors. The first, suggested by Lin, Izvorski, and Gawron, is that unconditionals involve the internal semantics of an interrogative. The second, discovered more or less independently by König, Zaefferer, Lin, Dayal, Izvorski, and Gawron, is that they involve an external semantics like that of a conditional. This second idea has in fact featured in the full range of research on unconditionals, from descriptive work (Quirk 1985; Huddleston and Pullum 2002) to typological work (Haspelmath and König 1998), to all sorts of discussions that touch on unconditionals in various ways (Haiman 1986; König 1986; Zaefferer 1990, 1991; Lin 1996; Dayal 1997; Izvorski 2000a,b; Gawron 2001). It is clear that these ideas are likely to form the core of any plausible analysis of unconditionals.

However, in previous research these ideas have been problematic both in motivation and implementation. With respect to the use of an interrogative semantics, I don't know of any real arguments that unconditional adjuncts are uniformly interrogative clauses. In particular, much previous research has assumed that "wh-ever" adjuncts involve an interrogative semantics, but as Haspelmath and König 1998 point out, it is far from an obvious assumption typologically or even in English. (Dayal 1997 is the exception, assuming a semantics based on that of free relatives.) In chapter 2 I give detailed and convincing arguments that the structure of an unconditional adjunct is, in fact, interrogative. (In the case of headed unconditionals, there is either an interrogative clause or a concealed question DP as the content of the adjunct.) This establishes the motivation for an interrogative semantics. Implementation-wise, previous analyses have left the interrogative semantics vulnerable to the domain expansion problem. That is, the alternatives involved in the question meaning are collected inside the adjunct, and their union is taken. This leads to a vacuous conditional claim. Consequently, the way that the semantics of an interrogative clause has been used in previous work cannot be the right way.

In previous work, the parallel with "if"-conditionals has been motivated mainly on grounds of intuitions about the meaning of unconditionals. These remain the strongest (or at least, most convincing) arguments, and it is surprisingly hard to produce any syntactic or formal argument for this position. Nonetheless, in chapter 2 I present a range of arguments motivating this position. Much more problematic has been the implementation of conditionality in unconditionals. Previous work has not led to any kind of true linguistic unification of unconditionals and "if"-conditionals. At best, the unification has been at the truth-conditional level; their meta-language translations have been similar. Both Izvorski 2000a,b and Gawron 2001 have suggested that this unification should go deeper; but neither provided any deeper unification. Izvorski suggests that unconditional adjuncts are weak adjuncts, but the term "weak adjunct" is the name of a problem, not a solution. Without any understanding of what constitutes the class of weak adjuncts, we should hope for some more complete unification. Further, specifying that they are weak adjuncts does not actually determine what the compositional semantics of an unconditional should be. Gawron suggests that "if"-conditionals and unconditionals should be unified on a deeper level as well, but this is the ending point of the paper.

The previous treatments of conditionality, for works that provide a proposal for resolving the nature of this conditionality, are summarized in Table 3.

Analysis	Treatment of conditionality
Zaefferer 1990, 1991	Denotation converges with "if"-clause denotation, different composition.
Lin 1996	Denotation converges, composition based on one version of the LKH theory (Heim 1990). But, specific to Mandarin "wulun...dou" structure.
Dayal 1997	Free relative adjuncts with conditional-like truth conditions.
Izvorski 2000b	Weak adjuncts, in the sense of Stump 1985. (But what are weak adjuncts?)
Gawron 2001	Denotation converges, different composition. Suggestion of an LKH-based unification.

Table 3: Previous treatments of the conditionality of unconditionals

The obvious question is whether the idea that unconditionals are conditional-like can be taken further. In chapter 3 I develop a linguistically unified account of unconditionals and "if"-conditionals, based on the account of "if"-conditionals developed in Lewis 1975; Kratzer 1977, 1981, 1986; Heim 1982. The idea is that different types of conditional adjuncts are similar not just in the kinds of truth-conditions they lead to, but in the semantic function of the adjunct. Conditional adjuncts in general, including unconditionals, serve to restrict the domain of an operator. Getting this to work out for unconditionals requires the right combination of question and conditional semantics, something that I argue hasn't been provided in previous literature.

A more general criticism of previous work, that goes along with the problematic implementation of conditionality, is that many previous analyses have not been fully compositional. What I mean by this is that to a greater or lesser degree, the interpretation of an unconditional has proceeded by a rule specifically designed to interpret an entire unconditional sentence. In the case of Zaefferer 1990, 1991, this takes the form of the procedure translating (un)conditionals into infons, and the different rules for interpreting each type of infon. In Gawron 2001 this takes the form of the rule for interpretation of the [cond] feature, which (despite its name) is specific to the interpretation of an unconditional. What we want for an analysis is not a construction-specific rule, but rather a general explanation for why the interaction of an unconditional adjunct with its main clause leads to the meaning that an unconditional has. That is, with a construction-specific rule, we effectively have no real explanation for the behavior of unconditionals, just a description of that behavior. A major goal of this dissertation is to develop a completely compositional analysis where the interaction of independently motivated pieces leads to an unconditional meaning.

It is important to note that with respect to the way an unconditional adjunct works in-

ternally, Gawron's 2001 analysis *is* compositional, and explanatory, whereas Zaefferer's 1990 is not. That is, Gawron's analysis provides an explanation of why different types of unconditionals pattern together, based on the semantics of interrogatives provided there. The infon-based account makes this pattern accidental. Therefore, any analysis should also try to preserve the explanatory nature of Gawron's 2001 adjunct-internal semantics. Whether the explanation is *correct* is of course a different issue. Gawron's explanation for the similar behavior is based on the interrogative semantics – each kind of unconditional involves a "pre-question" denotation, and these pattern together semantically and in their syntactic basis. I argue in chapter 2 that while the specific nature of this account is not motivated, the general idea is – the basis for the similar meanings in unconditionals rests on their interrogative nature.

Lin's 1996 analysis is compositional, and explanatory. However, because of differences between Mandarin Chinese and English, it does not transfer directly. Further, it is still subject to the domain expansion problem – a major obstacle for any analysis that makes use of an interrogative semantics for unconditional adjuncts. (In fact, it would seem that the domain expansion problem applies directly to the use of this analysis in Mandarin unconditionals.)

In summary, the previous analyses and general problems I have discussed lead to the three core goals listed in (107). The predominant previous view is that the similarity lies in the resulting denotations – there is some convergence in the denotations for unconditionals and "if"-conditionals.

(107) **Goals following previous analyses**

- Motivate and make use of interrogative nature of unconditionals, while avoiding domain expansion problem.
- Motivate and make use of a general semantics for conditionals.
- Fully compositional analysis.

CHAPTER 2 THE STRUCTURE OF AN UNCONDITIONAL SENTENCE

This chapter explores the syntactic structure of an unconditional, and proposes a precise analysis of both the internals and externals of an unconditional adjunct. I argue that internally, English unconditionals involve interrogative syntax (following Zaefferer 1990, 1991; Huddleston and Pullum 2002; Gawron 2001). This is straightforward for alternative unconditionals, but less so for constituent unconditionals. I also explore the distinctions between constituent, alternative, and polar interrogatives. Externally, I argue that unconditionals act like conditionals, and therefore should have the syntactic and semantic properties of conditionals.

There are two reasons to provide such an exploration. First, I aim at a fully compositional account of the semantics of unconditionals, and such an analysis must be syntactically justified and motivated – it must be faithful to the syntax. For example, if the internal structure of an unconditional weren't interrogative, its semantic analysis would have to proceed along completely different lines. The perspective I take is that the syntactic analysis contributes to the *explanation* of the behavior of unconditionals – from the fact that English unconditionals involve interrogative structure (and so on), certain aspects of their meanings follow (in combination with independently motivated denotations of the parts). Without an understanding of the syntax of unconditionals, therefore, we cannot arrive at a full explanation of why English unconditionals are the way they are, semantically and pragmatically.

The second reason for this exploration is that the syntax of unconditionals is of intrinsic interest, both their internal and external syntax. An understanding of unconditionals can advance the state of knowledge of the relationships between different types of interrogative structures, and of how clausal adjuncts work. Constituent unconditionals are interesting in the context of other constructions that involve "wh"-items. The larger research question is what such constructions (e.g. interrogatives, unconditionals, free relatives, relative clauses, exclamatives, etc.) have in common; unconditionals represent one of the few members of this class that have not been extensively studied.

Finally, unconditionals provide a basis for dealing with broader questions about the analysis conditionals at the syntax/semantics interface. In the final part of the chapter I explore the main accounts of the composition of conditional structures that have been proposed, and conclude that both general principles and the facts of unconditionals lead us to an account where a conditional adjunct functions to shift the context, introducing new background assumptions. Syntactically, this means that (un)conditional adjuncts pattern with a broad range of clausal adjunct structures, and do not involve any special structure in and of themselves. Unconditionals provide arguments against accounts where conditional adjuncts act like correlative structures (Bhatt and Pancheva 2006), binding a world or situation variable in the main clause. The discussion of the conditionality of unconditionals is set in the context of a generalized version of the Lewis-Kratzer-Heim theory of "if"-conditionals (Lewis 1975; Kratzer 1977, 1981, 1986; Heim 1982), where any adjunct that serves to restrict the domain of an operator is a conditional adjunct.

The chapter is broken into three parts. First, in §2.1, I develop an account of the internal structure of unconditionals as a interrogatives. Second, in §2.2 I argue that externally, unconditionals pattern with conditional adjuncts, and also with clausal adjuncts in general. Finally, in §2.3 I discuss analyses of conditional structures, and what unconditionals bring to the choice between these analyses.

2.1 Internal structure

In this section I discuss the internal structure of three kinds of unconditionals: alternative, constituent, and headed. I argue that alternative and constituent unconditionals involve adjoined interrogative clauses, and that headed unconditionals consist of a complementizer that selects for a question meaning. Thus, understanding the role of a question meaning in its compositional structure forms a key part of understanding English unconditionals. The overall structures I propose are schematized in Table (4) (where X stands for C or T, depending on where the unconditional is adjoined):

Alternative unconditional:	$[_{XP}\ [_{CP}$		$[_{C[Q]}$ *whether*]	$[_{TP} \ldots \textit{or} \ldots]\ ]$	$[_{XP} \ldots]]$
Constituent unconditional:	$[_{XP}\ [_{CP}\ [_{DP_i}$ *wh-ever*]	$[_{C'}$	$[_{C[Q]}$ $\emptyset$]	$[_{TP} \ldots t_i \ldots]]]$	$[_{XP} \ldots]]$
Headed unconditional:	$[_{XP}\ [_{CP}$		$[_{C}$ *no.matter*]	$[_{\text{question}} \ldots]\ \ ]$	$[_{XP} \ldots]]$

Table 4: Structures for unconditionals

Making the case that alternative unconditionals involve interrogative structure is not difficult. Formally, the adjunct patterns identically with embedded alternative interrogatives. Constituent unconditionals are somewhat trickier; the adjuncts are similar to root "wh-ever" questions, but also to "wh-ever" free relatives. Some researchers (Dayal 1997; Izvorski 2000a,b) have assumed that they are in fact free relatives. One larger issue that underlies the discussion of the syntax of constituent unconditionals is the connection between correlative constructions in languages like Hindi, and unconditionals in English. Hindi correlatives (as well as correlatives in a variety of languages) involve an adjoined relative structure (Srivastav 1991a; Dayal 1996; Bhatt 2003). I argue that unconditionals are not correlative constructions; there is strong evidence that their structure is not a relative structure of any kind, but is rather an interrogative structure.

In the sections that follow, I also discuss the structural analyses of alternative and constituent interrogatives that I will be assuming. The case of constituent interrogatives is straightforward; though the analysis of the distribution of "-ever" complicates things. The structure of an alternative interrogative I assume is somewhat more controversial. I argue, following Beck and Kim 2006, for a very straightforward mapping between surface appearances and syntax. That is, there is no evidence for any kind of syntactic similarity between alternative interrogatives and constituent interrogatives; there is no null operator movement, and locality effects are due to intervention effects.

First, I turn to the syntax of alternative unconditionals and alternative interrogatives.

2.1.1 Alternative unconditionals as alternative interrogatives

The internal structure of an alternative unconditional adjunct is relatively straightforward. It clearly takes the shape of an alternative interrogative clause. In the remainder of the section I show this using some canonical properties of alternative interrogatives.

Basic characteristics and intonation An alternative interrogative clause in English is characterized by a combination of interrogative morphology, and disjunction. When such a clause is not a root clause, interrogative morphology means the complementizer "whether".[14]

(108) Did Alfonso or Joanna do the crossword?

(109) I wondered whether Alfonso or Joanna had solved the crossword.

Intonationally, an alternative question is characterized by a pitch accent on the non-final disjuncts, and a final falling tone (Bartels 1999; Pruitt 2008). This final falling tone is what Zimmermann 2000 described as a "list closure" marker. Pruitt 2008 shows experimentally that it is the final falling tone that is crucial to disambiguating an alternative question from a polar question; the accent on the non-final disjuncts is neither necessary nor sufficient. When it does not have the right intonation, an interrogative which otherwise has the right ingredients (such as the examples above) is treated as a polar, not alternative question.

All of these ingredients are present in an alternative unconditional. We find interrogative morphology in the form of "whether", as well as disjunction. We find an absolutely obligatory final falling tone on the last disjunct, and there are typically the expected pitch accents on non-final disjuncts. (As Pruitt's work would suggest, these can be de-emphasized to the point of not being detectable.)

(110) Whether Alfonso or Joanna brought the beer, it will be a good brand.

(111) Fruela wondered whether Alfonso or Joanna brought the beer.

Disjunction in an alternative question has a special relation to the interrogative morphology that disjunction does not usually have; the interrogative morphology "licenses" disjunction, in a sense. In the case of a regular alternative interrogative, lack of disjunction results in an interrogative only having a polar interrogative interpretation. Polar and alternative interrogatives can be distinguished at the root level by the kinds of answers involved; polar interrogatives uniformly license *yes* and *no*. They can also be distinguished by the intonational contour mentioned above; polar interrogatives have a final rising intonation (Bartels 1999; Gunlogson 1999), and alternative interrogatives have the more nuanced pitch contour described above. In the case of an unconditional, lack of disjunction, or lack of the falling pitch contour on the last disjunction results in unacceptability. That is, polar interrogatives are disallowed in the unconditional construction; what simply leads to a different interpretation in root questions leads to ungrammaticality here.

[14]Note that the complementizer "if" is also possible in complement alternative interrogative clauses; in this respect unconditional adjuncts differ from embedded interrogative clauses.

(112) * Whether Alfonso brought the beer, it will be a good brand.

(113) * L*H-H%
Whether Alfonso brought beer or wine, it will be a good choice.

This ungrammaticality is a priori surprising. There are several meanings that it would be straightforward to get out of (112) on any theory of unconditionals that I know of, including the one I develop in the following chapter. We might expect a sentence like (112) to have the same meaning as a parallel *if*-conditional, or we might expect it to have the same meaning as a parallel alternative unconditional:

(114) If Alfonso brought the beer, it will be a good brand.

(115) Whether Alfonso brought the beer or not, it will be a good brand.

We might expect the *if*-clause meaning because in argument position, there seems to be little difference between the two kinds of clauses, at first glance.

(116) Fruela wondered whether Alfonso brought the beer.

(117) Fruela wondered if Alfonso brought the beer.

We might expect the *whether or not* meaning, since again, there is little difference between the two kinds of clauses at first glance. This is true both in complement position and in root position. In fact, some analyses have derived one from the other (see (Karttunen 1977a; Larson 1985); as well as Bolinger 1978 for some earlier history of this idea).

I return to the general problem of how the grammar can license or not license certain kinds of clausal adjuncts in chapter 4. The task for the present is to produce an analysis of alternative interrogatives that distinguishes them clearly from polar interrogatives. I return to this when discussing the syntax of alternative interrogatives in §2.1.2.

In the remainder of this section I give several more reasons to believe that alternative unconditional adjuncts have an identical syntax to alternative interrogative clauses in general. The arguments all have the same form; I consider some characteristic property of alternative interrogatives, and show that alternative unconditional adjuncts have this property as well. First, I look at a form of negative stripping found in alternative interrogatives, and on the position of the remnant in this stripping construction. Then, I turn to the intervention effects described by Beck and Kim 2006.

Pure negative stripping What Merchant 2003 terms "negative stripping", roughly, involve cases where clausal negation is left behind following some ellipsis process. Most of the cases Merchant examines are subcases of the general process of stripping, aka bare argument ellipsis (Hankamer and Sag 1976; Chao 1987; McCawley 1991; Depiante 2000 among many others; often analysed itself as a subcase of gapping; see e.g. Ross 1970; Sag 1980; Pesetsky 1982; Johnson 1996/2004, 2000 on gapping). These are examples like (118).

(118) Abby speaks passable Dutch, (but) not Ben. (Merchant)

What is important for present purposes is the presence of the negative marker "not", and the analysis Merchant proposes. The negative marker seems to be a high clausal negation (e.g. high Σ; (Ladusaw 1992)). Importantly, this position is outside TP. Merchant proposes (following Sag 1980; Pesetsky 1982 in earliest incarnations) that stripping consists of movement in combination with TP ellipsis (along the lines of sluicing or fragment answers).

Merchant also discusses cases where the negative marker is the only remnant, treating these also as TP deletion (see also Merchant 2006). I will refer to these as "pure negative stripping":

(119) I think I've solved this problem. But if not, I'll have to do a lot of rewriting.

(120) Why not?

We find pure negative stripping in alternative interrogatives:

(121) Alfonso knows whether Joanna went to the store **or not**.

(122) Did Joanna go to the store or not?

As is already apparent, pure negative stripping appears also in alternative unconditionals quite readily. The following example from above illustrates the fact.

(123) Whether Alfonso brought the beer **or not**, it will be a good brand.

Pure negative stripping is not a general characteristic of disjunction. It is also not found with *if*-clauses in adjunct position (though it is found in such clauses in complement position, provided they have an alternative question reading; cf. (125)).

(124) * (Either) Alfonso might go to the store or not.

(125) Joanna wondered if Alfonso would go to the store or not.

(126) * If Alfonso brought the beer or not, it will be a good brand.

The *if*-adjunct data might lead us to expect that *whether*-clauses in adjunct position would not allow pure negative stripping (though I will suggest in the following chapter that the example is out for more general reasons). So this test seems to be quite suggestive.

A second characteristic property of (non-root) alternative interrogatives is that the string *or not* can optionally appear far to the left of where it is expected, to the right of "whether".[15] This is possible in alternative unconditionals as well. In neither case is there any semantic distinction triggered by the unusual position of "or not".

(127) Joanna wondered whether or not Alfonso would go to the store.

(128) Whether or not Alfonso brought the beer, it will be a good brand.

[15] It is not clear at all how this should be analysed. The obvious possibility of movement is ruled out, or at least made very unlikely, by the fact that this happens only when pure negative stripping has taken place, not with the last disjunct in general. One possibility is that "whether or not" has become lexicalized as a complex complementizer with an alternative interrogative meaning.

This is not possible with any sort of "if"-clause, and not possible with other cases of disjunction, even those involving "either".

(129) * Joanna wondered if or not Alfonso would go to the store.

(130) * Either or not Alfonso might go to the store.

The presence of pure negative stripping following disjunction does not necessarily force our attention to an alternative interrogative analysis, since though it doesn't appear in other cases of disjunction, it is a relatively general phenomenon. However, the leftward appearance of "or not" is highly idiosyncratic to English alternative interrogatives, and is extremely strong evidence for such a structure.

Intervention effects Beck and Kim 2006 show that focus sensitive operators can intervene between a question operator and disjunction. The following are representative examples (from Beck and Kim's 26,28):

(131) ?* Did only Mary introduce Sue or Molly to Bill?

(132) ?* Does even John like Mary or Sue?

On a descriptive level, the problem in such examples is that "only" and "even" appear between the question operator and disjunction. If we place disjunction higher than the focus sensitive operator, an alternative question interpretation is much better (Beck and Kim's 27):

(133) Did John or Susan invite only Mary?

Beck and Kim also discuss similar intervention effects in German, Korean, and Hungarian alternative questions – they seem to be quite general. We find similar intervention effects in both embedded alternative interrogatives, and in alternative unconditionals. First, the examples showing intervention: (I have modified the "even" example to work better in an embedded context)

(134) a. * I asked whether only Mary introduced Sue or Molly to Bill.
b. Whether Mary introduced Sue or Molly to Bill, they are now good friends.
c. * Whether only Mary introduced Sue or Molly to Bill, they are now good friends.

(135) a. * I asked whether John even likes Mary or Sue?
b. Whether John likes Mary or Sue, he is being nice to them both.
c. * Whether John even likes Mary or Sue, he is being nice to them both.

Clearly, the structures involved in alternative unconditionals are sensitive to the same kinds of intervention configurations. We can see that, just as in (133) above, if the focus sensitive operator does not structurally intervene, the structure is licensed.

(136) a. I asked whether John or Susan invited only Mary.

b. Whether John or Susan invited only Mary, I think it was very rude.

In summary, with respect to intervention effects, alternative unconditional adjuncts appear straightforwardly to be alternative interrogative clauses.

Against further structure The discussion so far has established that an alternative unconditional adjunct contains at least an alternative interrogative clause. Perhaps this clause is exactly what is adjoined. Alternatively, we might imagine that there is further internal structure to an alternative unconditional adjunct, structure that we do not see. For instance, we might imagine that there is a silent "no matter" or "regardless of" in such unconditionals This has been proposed for similar structures in Mandarin Chinese by Lin 1996, and at a more abstract level it is one way of interpreting the feature that Gawron 2001 uses to delineate unconditionals. Gawron also proposes that alternative unconditionals contain an unpronounced "-ever".

It will be clear from §2.1.7 that it is not possible that there is literally an unpronounced "no matter" or "regardless of", as we might expect if we transfer Lin's analysis to English (see also discussion in chapter 1). The biggest point against this idea is that these items are much less selective than what we find with non-headed unconditionals. In particular, both "no matter" and "regardless of" allow polar interrogatives, which are disallowed as bare adjuncts. I do not see any way to predict this if the two structures were conflated.

(137) Regardless of whether Alfonso comes to the party, it will be fun.

(138) * Whether Alfonso comes to the party, it will be fun.

See that section for more discussion on the syntactic differences between headed and non-headed unconditionals.

If there is more unpronounced structure, it will therefore have to be somewhat more abstract. To argue against this kind of structure here is difficult. I know of absolutely no evidence for any such structure, but it is easy to make a proposal for such structure that makes no empirical predictions about the syntax. For instance, the proposal of a silent "-ever" in Gawron 2001, as far as I can tell, makes no testable predictions. (It does have some explanatory function, in the context of the theory of unconditionals developed there. See chapter 4 for more discussion. But I do not see any theory-independent way to test for its existence.) The idea that there might be some abstract unconditional operator that is more selective than "no matter" is also difficult to disconfirm. I will assume here that there is no further structure than what is seen, and that the burden of proof lies on an analysis that proposes such structure.[16]

[16] However, it is worth noting that, in chapter 4, in order to constrain the distribution of conditional adjuncts, I propose that they carry a conditional feature. This feature could be viewed as exactly the kind of untestable further structure that I am arguing against here. One difference is that something like this feature, or an equivalent syntax/semantics assumption along the lines of lambda abstraction, is necessary for the interpretation of conditional adjuncts across the board; as I show later in this chapter, such adjuncts lack any unified morphological marking.

2.1.2 The structure of an alternative interrogative

In this section I lay out my assumptions about the syntax of alternative interrogatives. The crucial ideas I adopt are not new: "whether" semantically marks the point where alternatives are collected into a question meaning, and has a licensing relationship with a disjunction in its scope (Larson 1985).

These ideas do not particularly narrow down the field of analyses of alternative questions. However, some further criteria do. As I will be using a Hamblin-style analysis of disjunction (Alonso-Ovalle 2005, 2006; Simons 2005), where disjunction introduces alternatives into the computation, we must choose a syntactic analysis that is compatible with this. While many analyses are compatible with the letter of a Hamblin analysis, they are not always compatible with the spirit. In particular, the way Hamblin semantics works obviates much of the need for any kind of null operator movement in alternative interrogatives. More empirically, there must be some distinction between alternative and polar interrogative structures. An analysis which makes them structurally identical will not do, since only one is acceptable as an unconditional adjunct. I discuss a range of evidence that the two kinds of structures should not be treated as structurally identical.

Analyses of alternative interrogatives differ in the extent to which they make the structures of alternative and constituent interrogatives related. This is important for an understanding of unconditionals, as it appears to be a construction (perhaps the only one in English) where alternative and constituent unconditionals pattern together in their syntactic distribution, and apart from polar interrogatives:

(139) Whether or not Alfonso comes to the party, it will be fun.

(140) Whoever comes to the party, it will be fun.

(141) * Whether Alfonso comes to the party, it will be fun.

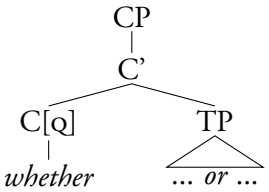
To explain these facts, we might appeal to some shared properties between alternative and constituent unconditionals. Therefore, it is worthwhile to know whether there are any such properties. Gawron 2001 in fact proposes that the pattern is due to a semantic similarity of alternative questions to constituent questions. We might also wonder about a shared syntactic similarity, as Larson 1985; Han and Romero 2004 argue that alternative interrogatives involve A' movement. Therefore, I examine the evidence for both sides of the debate about the structure of alternative interrogatives. I argue that the evidence for any structural similarity is not strong, and the explanation of the alternative/polar distinction does not lie in making alternative interrogatives like constituent interrogatives. (A full discussion of these facts must wait until an analysis of the semantics of unconditionals is in place, and therefore I examine the pattern illustrated above in detail in chapter 4.)

The final analysis I argue for is very close to that arrived at in Beck and Kim 2006, which in turn is close to von Stechow 1991. Both alternative and polar interrogatives involve a question feature(/operator) in C, but the two are also formally distinguished by the feature structure of the complementizer. There is no null operator movement, and the primary relationship

between disjunction and the question operator is a semantic one. Disjunction introduces alternatives into the semantic computation, and the question operator "collects" them in some sense.

The LF structure of an alternative interrogative I will assume is illustrated schematically in (142).

(142) **LF of an alternative interrogative**



What is important is that there is a [Q] feature in C, and a disjunction in its scope. Semantically, I will assume that the disjunction introduces alternatives into the composition of the sentence, and the [Q] feature serves as a Hamblin operator that manipulates alternatives. See chapter 3 for more details.

The case against a movement account The LF structure in (142) is broadly compatible with two kinds of derivations. The first, which is a very traditional analysis (Baker 1968, 1970; Bresnan 1972; Stockwell et al. 1973, etc.; see Beck and Kim 2006 for a recent revival), is that "whether" is base-generated as a C, bearing the [Q] feature. The second possible analysis is that "whether"/[Q] is base-generated near disjunction, and moves to its surface position (Larson 1985; Han and Romero 2004). (An alternate possibility that is very close in predictions is that "whether" is a base-generated C, but there is null operator movement from the left edge of disjunction to the specifier position.)

Larson 1985 gives, broadly, two reasons for thinking that a "wh"-element moves in the structure of an alternative interrogative. Larson's proposal in particular is that it is "whether" that moves, and that it moves from the left edge of the disjunction phrase into a specifier(/COMP) position. Larson 1985 aims at a uniform treatment of "whether" and "either", where "either" marks the left edge of the disjoined elements. If they are to be treated uniformly, then "whether" should also mark the scope of disjunction. But, the puzzle is that it always appears at the left edge of the clause, which is sometimes higher than the actual scope of disjunction. This leads to Larson's first reason for proposing that "whether" moves, to unify it with "either". The idea is that it moves from its scope-marking position into the specifier position.

The second reason to think that "whether" moves is a more empirical one: it shows sensitivity to subjacency, and to "wh"-islands. The general empirical point is that the relationship between "whether" and "or" is subject to some locality constraints, and the analytical claim made by Larson 1985 is that these are the locality constraints of A'-movement. (See also Han and Romero 2004.) The following sentences, according to Larson, show a contrast in the

readings available, due to subjacency. They can also be taken to show that the "whether-or" relationship does not cross a clausal complement boundary.

(143) a. The decision whether to believe that Bill resigned or retired is completely up to you.

b. The decision whether to believe the claim that Bill resigned or retired is completely up to you.

The first of these sentences clearly has two readings, a polar reading (whether Bill resigned / retired or whether he didn't), and an alternative reading (whether he resigned, or he retired). Thus, the "whether-or" relationship can span a clause boundary. The second example lacks an alternative reading. The reading would be something like "the claim that Bill resigned, or the claim that Bill retired." I agree that this reading is completely absent from the second sentence; this is a fact that a non-movement account must explain in some way. Even if subjacency is not accepted as a principle of grammar, this data still reflects that the "whether-or" relationship cannot cross a complex DP island boundary involving clausal complements.

Larson also considers "wh"-islands:

(144) I know whether Bill wonders who resigned or retired.

Here again it is difficult to get the alternative reading. It is not clear to me that it is completely impossible, and Larson acknowledges that it may be possible (describing it as "at best marginal...with [the polar reading] strongly preferred"). In any case it is certainly very degraded.

Han and Romero 2004 present the argument from islands as well, but do not discuss any new data. They do add several new arguments for a movement account. They observe that in other dialects of English (Middle English, Belfast English), "whether" can co-occur with a complementizer, as can "wh"-items. This co-occurance suggests that it appears in SpecCP (sometimes, a second specifier) in these dialects. If it appears in a specifier position, it presumably has moved there. However, it is not clear that this is really what the attested order in such dialects indicates. See Cable 2007 for discussion of question markers that can structurally c-command interrogative pronouns, despite not appearing in specifier position and not having undergone (independent) A′ movement. I will not address this argument further here, though I take it that it is an open question just what the syntax of "whether" is in such dialects.

A second argument from Han and Romero is based on asymetries between "whether" and "either". Schwarz 1999 proposes that "either" disjunctions involve ellipsis, and Han and Romero 2004 extend this to alternative interrogative structures. A puzzle for Schwarz, that Han and Romero's analysis solves, is that "whether" can appear in surprisingly leftward positions that "either" cannot; this causes Schwarz to not unify the two kinds of disjunction. These positions are surprising because they would involve a dangling remnant. (Right node raising to derive these is, apparently, not possible.) In fact, on a movement account, "whether" has to appear in this position for independent reasons, and so seems to be fine with a dangling remnant. The following examples illustrate this with the preposition "off" as the dangling remnant:

(145) a. ?? Either this pissed Bill or Sue off.
b. This either pissed Bill or Sue off.

(146) (Alfonso knows) whether this pissed Bill or Sue off.

Han and Romero suggest that the difference follows from the movement of "whether", and the lack of movement of "either". The position that "either" appears in is the same location as the trace of "whether". The underlying structure of disjunction is the same, and the appearance of a dangling remnant is due to leftward movement of "whether". This can be taken as an argument for movement in the first place, insofar as deriving a unified account of "whether" and "either" disjunction is very desirable. In this sense, it falls into the same category as the first argument I presented above from Larson 1985 (and in fact may be a special case of Larson's general point).

In summary, we have two kinds of arguments for a movement account. First, it makes unification of "whether" with "either" much simpler and more attractive. Second, the locality constraints on the "whether"/"or" relationship pattern with constraints on movement.

I will not take up the first kind of argument here, as my goals are not to propose a unified account of "whether" and "either". This is an obvious point for contention between the kind of analysis that I eventually adopt, and one which unifies the two items. However, as far as I can tell, these arguments have no empirical force outside attempts to strongly unify the two items. In fact, I take it to be an open question how much they should be unified. For instance, see Kaplan 2007, 2008 for some complicated displacement behavior of "either", that as far as I know, there is simply no evidence for "whether" sharing. Kaplan 2007 argues in general (focusing on "either", "both", and "neither") that while there is a class of items that mark the left edge of conjunction structures in some way, their behavior is highly heterogeneous. Much of the motivation for a unification of "whether" and "either" is on the basis of an apparent morphological similarity ("wh" + "either"), but as far as I know this is a highly specific fact about English that they have a similar shape.[17] In general, it does not seem that left-edge markers tend to be morphologically related.

The second kind of argument has empirical force completely independent of the goals of any analysis. It is undeniable that Larson's examples show a true locality effect of some kind. Therefore, we must see whether this locality effect really is the same effect found with A′ movement.

This claim has been called into question by Beck and Kim 2006, for a variety of languages (see §5.2.1 of that paper). They give a range of examples that should be unacceptable island violations, but in fact are acceptable or only slightly degraded. I will give some of Beck and Kim's English examples and introduce some new ones.

Beck and Kim produce acceptable examples involving adjunct islands and relative clause islands. For quick viewing, I have notated the disjunctions and the island boundaries. (There is of course no "whether" here since the entire sentence is an alternative question.)

(147) Are you more pleased [$_{\text{adjunct}}$ when you see *Anne or Lena*]?

[17] For instance, in German the two look nothing alike: "entweder" ("either") vs. "ob" ("whether").

(148) Do you need a person [$_{RC}$ who speaks *Dutch or German*]?

All of these examples should be bad or significantly degraded if there were A′-movement from the left edge of the disjunctive phrase to the specifier of the root clause.

Interestingly, even Larson's examples are more complicated than they seem. Once the verb "know" in (144) is switched for an intensional question-embedding verb, an alternative reading becomes much better, assuming the correct intonation is given to disjunction:

(149) I asked/thought about/wondered whether Bill wonders [$_{\text{wh-clause}}$ who *resigned or retired*].

This sentence much more easily lends itself to the interpretation "whether Bill wonders who resigned, or whether he wonders who retired." So in Larson's example in (144), the extensional question-embedding verb *know* interferes with the judgement somehow. (Beck and Kim also report a similar example involving "want to"). This is interesting, given that alternative readings are possible in the direct complement of "know":

(150) I know whether Bill resigned or retired.

Here are a few more examples, involving relative clause boundaries, free relative boundaries, possessive DP boundaries, and adjunct boundaries. (As with the preceding data, care must be taken to pronounce these with proper alternative intonation. There may still be some gradience in these judgements.)

(151) Alfonso wondered whether Joanna took into account the people [$_{RC}$ who *hate oysters or hate scallops*.]

(152) Alfonso wondered whether Joanna took into account [$_{\text{free relative}}$ whoever hates *oysters or scallops*.]

(153) Alfonso wondered whether Joanna borrowed [$_{\text{possessive}}$ *Fruela or Henry*]'s scarf.

(154) Alfonso wondered whether Joanna got mad [$_{\text{adjunct}}$ because of *her grade or her narrative evaluation*.]

These facts certainly require explanation on any account, though a base-generation account is favored. A movement account is too strong; it predicts island violations in a range of cases where we don't see them. A base generation account by itself does not predict the locality effects that we do see. The reason why a base-generation account comes out ahead on these data is that it is much easier to strengthen such an account with an additional licensing mechanism, than it is to weaken a movement account to allow certain island violations. In fact, such a strengthening already exists in the form of Beck and Kim 2006.

Beck and Kim 2006 propose that any locality effects involved in alternative questions are due to intervention effects, and I will adopt this proposal here. It is clear from Beck and Kim's work that alternative questions are sensitive to intervention (see (131-133) earlier in this chapter), so *some* locality effects are certainly due to intervention. Beck and Kim suggest (building on

work by Guerzoni[18]) that the complex NP examples, specifically when they are definite, involve an intervener. I take this to be highly plausible. Similarly, it seems plausible to assume that extensional question-embedding verbs might lead to intervention effects that intensional verbs do not. It is clear that a worked out theory of such intervention effects is still lacking, and Beck and Kim 2006 is probably not the last word on the topic, but I think it is also clear that an intervention approach is much more promising than an island approach.

Larson discusses two potential arguments against a movement account, in order to dispel them. In the remainder of this section I discuss the arguments and suggest that neither can be done away with. The first is old and obvious – we never find "whether" positioned *in situ*:

(155) * I don't know who should whether resign or retire.

Another way of putting this is that the primary reason for thinking "whether" is a C is that it has exactly the distribution of a C (in modern/standard English); we never find it in any other syntactic region (Bresnan 1972). Larson's response to this objection is theoretical; he points out that this distributional fact can be explained by appealing to the ECP, if a syntax for "whether"'s base position is assumed where it can never be properly governed. I will accept that this can be solved technically (probably on any theory of A'-movement), but I do want to point out that such a solution is not an argument for the movement theory.

The second potential argument against the movement account discussed by Larson 1985 is the presence of "whether" in polar questions. Polar questions have no disjunction, and therefore there seems to be no place for "whether" to move from. The appearance of "whether" in polar questions is, on the other hand, predicted straightforwardly on a base-generation account. Larson argues that polar interrogatives are in fact alternative interrogatives with an elided "or not". The distinction between polar and alternative interrogatives, for present purposes, is a signficant issue, and I treat it separately below. There I show that this view is not plausible.

There is yet one more argument against a movement account for alternative interrogatives that I have not seen in the previous literature. The argument, as far as I can tell, is the last straw for a movement account, if what we are to move is "whether"/Q. The crucial observation is that disjunction in an alternative question can overtly take scope wider than the position of "whether"/Q:

(156) Did Alfonso walk to campus or did he take the bus?

(157) Joanna wondered whether Alfonso walked to campus or whether he took the bus.

In these sentences, crucially, we get an alternative question meaning. This is simply not compatible with an account where "whether" is base-generated outside the scope of disjunction and moves to SpecCP, because disjunction in each case is no smaller than C′ and each disjunct contains a "whether". The intonational pattern suggests that these are not disjoined polar

[18] Beck and Kim 2006 cite Guerzoni 2006, which at that time was to appear. However, it does not seem that the version that was later published discusses definite articles and intervention effects.

questions, as well as the meaning. If this were regular disjunction, we'd predict (157) to mean the same thing as:

(158) Joanna wondered either whether Alfonso walked to campus or whether he took the bus.

In the alternative question reading, Joanna wondered which of two alternatives was the right one. In the true disjunction reading, there are two polar questions and she wonders about one of them. Another way of putting it is that we would expect a reading parallel to the one possible with "and" substituted for "or" in (157); we don't get such a reading.

This data is compatible with an account where "whether" is a base-generated C, and a null operator moves from a position adjoined to disjunction into SpecCP (provided that we allow bar-level adjunction, of course; disjunction would be of C's, so this is where the opeartor would have to be adjoined). However, if it is "whether" that moves from a position adjoined to disjunction, we would be forced to suppose that it ATB-lowers into a specifier position in order to get the double appearance.

A movement account of alternative questions suffers from a range of problems. Most importantly, it turns out that the "whether"..."or" interaction is not sensitive to island boundaries, though it is sensitive to interveners. Therefore, the balance of the evidence favors the position that "whether" is a regular complementizer, and there is no movement in the structure. In this respect, polar interrogatives and alternative interrogatives are alike, and distinct from constituent questions.

Further distinctions between constituent and alternative interrogatives I have shown that alternative and constituent interrogatives do not pattern together with respect to A′ dependencies. In this section I discuss several further ways in which the two kinds of interrogatives differ. It will become clear that though they are both interrogatives, they are otherwise quite different, and any account of the polar-clause gap that relied on their similarity would be in trouble.

As noted by Beck and Kim 2006[19], there are verbs that select constituent questions, but not polar or alternative questions. These are emotive factives, such as "be amazing", "be surprised", and "bother". The first two examples are from Karttunen 1977a:

(159) It is amazing what they serve for breakfast.

(160) * It is amazing whether they serve breakfast.

(161) * It is amazing whether they serve breakfast or lunch.

This selectional pattern suggests that polar and alternative interrogatives form a group, not alternative and constituent questions.

[19]They thank Regine Eckardt for bringing it to their attention. The constituent/polar data was first discussed by Karttunen 1977a.

Beck and Kim also discuss the possibility of mixed alternative/constituent questions. If alternative and constituent questions work the same way, we would expect the following examples to work with a mixed reading:

(162) Who taught syntax or semantics?

(163) # Alfonso wondered whether John or Mary taught who.

The first example (one of Beck and Kim's) works, but it does not have the predicted reading. The absent reading is one where the speaker is asking either for a list of people who taught syntax, or a list of people who taught semantics (a pair-list reading). Note that it does have a mention-some reading, but this is indistinguishable from a non-mixed reading. The second example tries to build a multiple question with the disjunctive element being the main one (see also Larson 1985 fn. 14 for similar data and a proposed solution on that account.) This is simply impossible.

Parallel to (162) consider the following embedded examples:

(164) Bill knows whether Alfonso said something to Joanna or Fruela.

(165) ?? Bill knows what Alfonso said to Joanna or Fruela.

(166) * Bill knows what Alfonso said to whether Joanna or Fruela.

We might expect a reading for the second or third sentence that combines the alternative question meaning (illustrated by the first sentence) with the constituent question meaning. That is, "what Alfonso said to Joanna and what he said to Fruela." This reading does not seem to be possible, and it isn't actually clear disjunction is possible at all in this context.[20] With an explicit "either", a marginal ignorance reading is available; no explicit "whether" is possible. The puzzle about this sentence for a movement account is why a covert or overt Q/"whether" is not licensed in situ for the same reasons that in situ "wh"-phrases are licensed in multiple questions. In general, we can conclude from this data that alternative questions do not pattern with constituent questions structurally.

Distinctions between polar and alternative interrogatives One of the questions raised earlier in the chapter is how close polar and alternative interrogatives are. The idea that they are formally identical at some level of the grammar has a long history. See e.g. Karttunen 1977a and Larson 1985 for some recent proposals of this kind, and Bolinger 1978 for some earlier history of the idea. A major component of Larson's 1985 and at some conceptual level any "whether"-movement analysis, is that polar interrogatives should be derived from alternative interrogatives.[21] Unconditionals, given the impossibility of adjoined polar interrogative clauses, call this into question.

[20] This kind of reading *is* possible if the matrix verb is negated, as might be expected.

[21] Han and Romero 2004 attempt to remain agnostic about whether this is necessary on their account, which involves "whether"-movement, but they do not say what the source of polar "whether" would be if it does not move from a clause-internal position.

(167) Whether Alfonso comes to the party or not, it will be fun.

(168) * Whether Alfonso comes to the party, it will be fun.

Therefore, I will address the viability of analyses that equate the two at either the syntactic or semantic level. The conclusion is that there are many reasons to syntactically and semantically distinguish the two constructions, beyond the argument from unconditionals. In the end, we will be in a position to propose a structural encoding of the distinctions between polar, alternative, and constituent interrogatives.

Larson 1985 proposes syntactic identity between the two kinds of clauses. In discussing a movement account and potential arguments against it, Larson 1985 considers the presence of "whether" in polar questions. Polar questions have no disjunction, and therefore there seems to be no place for "whether" to move from. Larson argues that polar interrogatives are in fact alternative interrogatives with an elided "or not". This is based on the apparent synonymity of pairs like the following:

(169) Alfonso wondered whether Joanna wanted some coffee.

(170) Alfonso wondered whether Joanna wanted some coffee or not.

Karttunen 1977a proposes semantic identity: that despite somewhat different syntactic derivations, the examples above have identical denotations. (Actually, the "or not" cases Karttunen takes to be literally polar questions, defined syncategorematically, but this is not a necessary component if the analysis of pure negative stripping is taken seriously.)

Both versions of the alternative/polar identity view are problematic, as pointed out by Bolinger 1978. First, we find environments where only polar interrogatives are selected for. These are the complement of dubitatives; these facts are due to Karttunen 1977b.[22]

(171) I doubt whether they serve breakfast.

(172) * I doubt whether they serve breakfast or not.

(173) * I doubt who serves breakfast.

(We can also use polar "if"-clauses, as well as "that"-clauses, in this environment, to similar effect. I return to a discussion of this data from a semantic perspective in chapter 4.)

Bolinger 1978 discusses a wide range of environments (twelve) where the two do not pattern the same. I will discuss only a few representative examples here, and return to this issue in more detail in chapter 4. In information-conveying questions, only polar interrogatives are allowed:

(174) By the way, did you know that Jack Robinson was my cousin?

(175) # By the way, did you know that Jack Robinson was my cousin or not?

[22] Interestingly, in many languages, e.g. Romance languages, only a declarative clause is allowed as the complement of a dubitative. On the other hand, Karttunen says that English isn't the only language with the interrogative pattern, with Finnish as one other case.

Questions where the speaker does not care about a negative answer cannot be alternative questions:

(176) Is today the 17th?

(177) # Is today the 17th or not?

Positive biasing items (e.g "some" and "often") are not allowed in alternative questions:

(178) Have you often been there?

(179) # Have you often been there or not?

The conclusion from this (and much of Bolinger's other data) is that there is a difference in *bias* between the two types of questions (cf. Tedeschi 1977). I return to this in chapter 4.

Another kind of argument comes from polarity particles; direct polar interrogatives license "yes", "no", "maybe", "perhaps", and so on. These particles are marginal at best in response to a direct "or not" question:

(180) A: Would you like coffee?
B: Yes. / no. / maybe. / etc.

(181) A: Would you like coffee or not?
B: ?? Yes. / no. / maybe. / etc.

Again, on an account that equates the two, we'd expect "or not" questions to act identically to polar questions.

These arguments taken together strongly suggest that polar interrogatives are not derived from the corresponding "or not" interrogatives, and vice versa. They cover a range of selectional, semantic, and pragmatic differences.

What are the grammatical ramifications of these arguments? Consider the selectional patterns we find. There are verbs that select all three types of interrogative clause ("know", "wonder", "ask", etc.). There are verbs that select just constituent interrogatives, but not the other two (emotive factives). There are verbs that select just polar interrogatives (English/Finnish dubitatives). We do not, as far as I know, ever find any verbs that select only for alternative interrogatives.

This pattern suggests that (assuming all the selectional facts are subcategorization/syntactic selection facts) we should formally distinguish the different kinds of interrogative clauses. It is already standard to assume that constituent interrogative clauses have some special property that forces an interrogative pronoun to move into their specifier, e.g. an uninterpretable WH feature. Alternative and polar interrogatives, involving no movement, must not have this property. The fact that polar interrogatives can be selected for suggests that they too involve some featural distinction. If we are to capture this featurally, we need at least the features in table 5. Though this table does not mark alternative interrogative clauses (since there is no class of verbs that select just for them), I do not want to exclude the possibility of formally

identifying them, and in fact do so in chapter 4; when I use it I will refer to this feature as ALT. One reason to suspect such a feature is that the characteristic intonation of alternative interrogatives (Bartels 1999) should be tied to some lexical material.

features on C	interrogative type
[iQ, uWH]	constituent
[iQ, iPOLAR]	polar
[iQ]	alternative

Table 5: Featural characterization of interrogative clauses

Such a characterization is convenient for semantic reasons that I discuss below, and because it gives a lexical structure to base certain constraints on in chapter 4.

The possibility remains that some or all of these features are best thought of as epiphenomemons of some semantic properties of the clauses involved. That is, some of the selectional behaviors that motivate the feature choices above might be semantic.

The conclusion that polar interrogatives have a feature that formally marks them is interesting for semantic reasons. To see why requires some background on the semantic analysis of questions, previewing chapter 3. On a compositional Hamblin semantics for questions, a question denotation comes about by the interaction of two elements; an alternative-introducing element, and a question operator (Hamblin 1973; Kratzer and Shimoyama 2002). In the case of an alternative question, it is disjunction that introduces alternatives into composition (following von Stechow 1991; Beck and Kim 2006 on the one hand and Alonso-Ovalle 2005, 2006; Simons 2005 on the other):

(182) $[\![\textbf{[X or Y]}]\!]^{g,w,c} \underset{\text{def}}{=} [\![\textbf{X}]\!]^{g,w,c} \cup [\![\textbf{Y}]\!]^{g,w,c}$

Via "pointwise" composition, alternatives introduced by such lexical items grow until they interact with some alternative-sensitive operator. The question operator is one such operator, though in one instantiation it does not do anything to the alternatives:

(183) **Question operator, preliminary version** (from Kratzer & Shimoyama)
$[\![\textbf{[Q } [\alpha]]]\!]^{g,w,c} \underset{\text{def}}{=} [\![\alpha]\!]^{g,w,c}$

Most Hamblin operators, such as the quantificational operators, collect alternatives and produce a singleton set. What is the point of an operator that just lets alternatives through? At the clausal level the distinction in meaning between declarative and interrogative sentences is captured by the size of the alternative set. I will use the terms "information" and "issue" here as neutral terms to refer to the denotations of declarative and interrogative clauses respectively. (In terms of the kind of speech act involved in root clauses, these correspond to assertions and questions respectively; assertions contribute information, and questions raise issues.)

(184) **The *information/issue* distinction in a compositional Hamblin semantics**

An information-type denotation is a singleton set, whereas an issue-type denotation is a non-singleton set.

This contrasts with accounts like the Hamblin semantics of Karttunen 1977a, as well as the semantics of Groenendijk and Stokhof 1984, where the information/issue distinction is captured in the type system. For example, under Groenendijk and Stokhof's account, information has type ⟨st⟩, a regular proposition, and issues have type ⟨s⟨st⟩⟩. In Karttunen's Hambin semantics, the alternative sets are reified in the type system; information is again a proposition, and issues are type ⟨⟨st⟩t⟩. In a Hamblin semantics, both have type ⟨st⟩.

All of this is relevant because on the compositional Hamblin account it is not the question operator that introduces alternatives, and so the question operator by itself won't cause a question meaning. It needs a matching lexical item that introduces alternatives. For an alternative question this is disjunction, and for a constituent question, the interrogative pronoun. In a polar question, there is no such item apparent in the surface syntax. If something else is not done to introduce alternatives, the denotation of a polar question would therefore be a singleton set; this is the wrong result. We want a polar question to have an issue-type denotation. One possibility, of course, is to try to derive polar questions from alternative "or not" questions, but above I have argued extensively against this.

This quandry is not specific to a compositional Hamblin semantics of the kind I have described, though it appears in a more general instantiation. The quandry is in fact why Karttunen 1977a does not structurally relate polar and alternative questions; the analysis there defines each syncategorematically without decomposing either. The polar question rule introduces alternatives at the same time as it collects them to form a set of propositions. The alternative question rule does not decompose the meaning of disjunction in a way that is uniform with non-alternative-question disjunction. Groenendijk and Stokhof 1984 make the question operator more powerful than it is in the Hamblin semantics; there it does the equivalent of introducing alternatives (partitioning the set of worlds). (It is somewhat underspecified in how it partitions, exactly.) But this results in a non-compositional stipulation for alternative questions, where disjunction has to be (syncategorematically) treated in a non-uniform way with disjunction outside of questions.

The feature system in table 5 provides a "hook" for solving this dilemma within the compositional Hamblin semantics. The iPolar feature can provide the alternative introduction:

(185) **Alternative negation**
Where A is an alternative set of propositions,
$\neg A \underset{\text{def}}{=} \{p \mid \exists p' \in A \text{ s.t. } p = \mathcal{W} - p'\}$

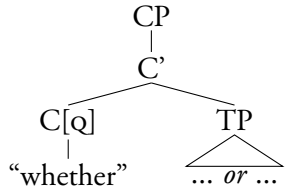
(186) **Polar question operator**
$[\![[[\textbf{iQ, iPolar}]\ [\alpha]]]\!]^{g,w,c} \underset{\text{def}}{=} [\![\alpha]\!]^{g,w,c} \cup \neg\, [\![\alpha]\!]^{g,w,c}$

It is easy to see how to decompose the meaning of the iPolar feature by itself, given the lack of alternative manipulation of the iQ feature by itself. Some stipulation of this kind is necessary

in a compositional Hamblin semantics; and here I have motivated the compositional source of the stipulation on the basis of evidence from selection.

Conclusions The arguments discussed in this section are strongly in favor of an account of alternative interrogatives that does not involve movement, following Beck and Kim 2006. On this kind of analysis "whether" is simply a complementizer marking interrogative clauses. This is a return to the more traditional accounts of e.g. Baker 1968 and Bresnan 1972, and away from the heritage of Larson 1985. Consequently, the LF that I outlined in (142) is also the base structure.

(187) **Narrow syntactic structure of an alternative interrogative**



Following Beck and Kim 2006 I take the "whether"..."or" relationship to be sensitive to intervention effects. The apparent island violations that are ungrammatical seem amenable to analysis as intervention effects, though there remains much work to be done on this issue. In any case, it is clear that they do not result from the same phenomena that cause island effects on any account of island effects.

I looked at a number of contrasts between alternative and constituent questions, and between alternative and polar questions. This data in general argues against any attempt to reduce either of the categories to the other. With respect to the unacceptability of polar interrogative clauses in adjunct position, this data argues against an analysis, such as Gawron 2001, that explains the polar gap on the basis of alternative and constituent questions patterning together. (I discuss Gawron's analysis in more detail in chapter 4.) Finally, I have argued for a featural distinction from polar questions and constituent questions, on the basis of selectional distinctions.

2.1.3 Constituent unconditionals as constituent interrogatives

In this section I first argue that constituent unconditionals involve interrogative structure, and then outline my assumptions about that structure. The first task is much trickier than it was for alternative unconditionals. This is because of the English-internal plausibility of the analysis of constituent unconditional adjuncts as free relatives, and the cross-linguistic plausibility of their analysis as correlative adjuncts.

In analyzing English unconditional adjuncts as being interrogatives structurally, I am following Zaefferer 1990, 1991 and Huddleston and Pullum 2002, as well as Gawron 2001 to some extent (see below). It is worth noting that while an interrogative structure for unconditionals is widespread, it is by no means cross-linguistically universal. For alternative unconditionals,

there is a mix between types that involve interrogative syntax, types that involve conditional syntax, types that involve simply some kind of subjunctive marking, types that involve "want" verbs, and types that involve some explicit unconditional head (Haspelmath and König 1998). Constituent unconditionals, in Haspelmath and König's survey, are much more homogeneous in that they nearly all involve interrogative pronouns. However, in many of the languages it is not clear whether apparent unconditionals involve interrogative or relative syntax. In fact, we can see from languages like Hindi, that some unconditional-like meanings can apparently be expressed using a correlative structure (i.e. with the particle "bhii", see Srivastav 1991b, Dayal 1995). This is unsurprising in a way, since in English there are often close paraphrases of unconditionals with "wh-ever" free relatives. However, it raises the question of what, exactly, the structure we see is in English.

The most obvious competing hypothesis about their structure is that constituent unconditionals involve adjoined free relatives (FRs). Superficially, constituent unconditional adjuncts look like the construction usually referred to as "wh-ever" free relatives, and the two can often have similar meanings.

(188) Whoever Alfonso is talking to, she is getting mad.

(189) Whoever Alfonso is talking to is getting mad.

The FR hypothesis has been suggested by Dayal 1997 and explored by Izvorski 2000a,b; Izvorski takes this hypothesis as axiomatic. Interestingly, Izvorski shows that the consequences of this assumption are an interrogative-like syntax and semantics for adjoined FRs, which Izvorski proposes are of category CP, and have a propositional/question-like, not entity-based, semantics. I discuss this in more detail below, and point out that the assumption is simply not empirically justified. Once this assumption is removed, Izvorski's arguments uniformly point to unconditional adjuncts having interrogative form and syntax.

A free relative analysis is a possible interpretation of the syntax that Gawron 2001 assumes, though this is not exactly Gawron's position. More specifically, Gawron 2001 treats "wh-ever" adjuncts and what are typically called "wh-ever" free relatives in a uniform way. He does not classify "wh-ever" FRs with plain free relatives, however, calling the "-ever" constructions "alternative NPs", following unpublished work by John Richardson (Gawron does not adopt the DP hypothesis, so for our purposes, NP here means DP). For Gawron, both alternative NPs and unconditionals are related, but not structurally identical, to constituent interrogatives. As a matter of terminology, I will refer to "wh-ever" phrases in argument position as free relatives, but this analytical possibility should be kept in mind. I suggest below that the tests given in Gawron 2001 are not conclusive, and I argue against the alternative NP analysis.

The free relative hypothesis gains initial plausibility from the existence of correlative construction. Cross-linguistically, a correlative construction (Srivastav 1991a,b; Dayal 1996; Bhatt 2003 among others) consists of a relative-like structure adjoined to a clause; the relative structure binds a proform in the clause. Some theories (e.g. Bhatt and Pancheva 2006) assume explicitly that the relative-like adjunct consists of a free relative. Srivastav/Dayal, on the other hand, argues for a semantic but not syntactic similarity between the two. In any case, con-

stituent unconditionals, at first glance, look quite similar to correlative structures in languages like Hindi.

The remainder of this section discusses a number of tests that can be used to determine the syntactic properties of unconditionals; some of these tests come from previous literature, and some are new. The frame in which I present these tests is the following. Analyzing unconditionals as free relatives, or as some other kind of DP-shaped relative structure, makes certain predictions, and analyzing them as interrogatives makes certain other predictions. To the extent that these predictions differ, we have points of empirical confirmation of one analysis or another. The predictions come in roughly two categories: (i) predictions made about the external distribution and semantic contribution of the adjuncts, and (ii) predictions about the possible kinds of internal structure of the adjunct. With respect to category (i), an interrogative analysis predicts that a constituent unconditional will have a distribution and meaning matching other kinds of interrogative structures. I show that this is so with respect to echo questions formed off of unconditionals, the patterning with alternative unconditionals, and the non-referentiality of unconditional adjuncts. A correlative analysis in particular would predict that the adjunct must co-occur with a proform in the main clause, and I show that this is not so. With respect to category (ii), an interrogative analysis predicts such possibilities as multiple "wh", pied piping, and the appearance of idioms that are independently known to appear only in questions (e.g. "what was X doing Y"; cf. Pullum 1973; Kay and Fillmore 1999).

To summarize, here are the three main (closely related) questions that I will answer in this section:

1. Are "wh-ever" adjuncts (free) relatives? Are they interrogatives? (Are they something else?)

2. Are constituent unconditionals correlative constructions (or related somehow)?

3. What is the category of a "wh-ever" adjunct? (CP or DP?)

We will see that the evidence overwhelmingly points to an analysis of constituent unconditionals interrogatives, not free relatives, points to a CP analysis, and is entirely against a correlative analysis.

The presence of "-ever" The first test concerns the presence of "-ever", the reason why a free relative analysis is so initially attractive. The presence of "-ever" does not turn out to be a useful diagnostic, and I discuss it first only to preempt the concerns which the appearance of that suffix raises. It has been occasionally suggested that the presence of "-ever" on the "wh" items indicates we are dealing with a free relative construction. (This seems to be one reason that Izvorski 2000a,b assumes a FR hypothesis in the first place.) But the presence of "-ever" is completely inconclusive, because we do find "-ever" in interrogatives:

(190) Whoever could have done that?

(191) Whatever could Alfonso be saying to that woman?

Questions of this sort have a kind of rhetorical feel. It is not really that they are rhetorical questions, but that the speaker expresses some kind of incredulity at the range of possible answers. In (190), the speaker can't believe that anyone could have done that. In (191) the speaker conveys uncertainty as to there being anything Alfonso would have to say to the woman, or that Alfonso would want to talk to the woman. I give an account of the semantics of this kind of question in chapter 4.

The presence of "-ever" in interrogatives is mainly a root phenomenon. However, in certain contexts it is licensed in embedded interrogatives, namely under intensional verbs that express a complete lack of knowledge. It is more marginal, the less thorough the lack of knowledge is.

(192) ? I have no idea whatever Alfonso could be saying to that woman.

(193) ?? I wonder whatever Alfonso could be saying to that woman.

(194) * I know whatever Alfonso could be saying to that woman.

Examples of the first kind, though marginal, are occasionally attested (found via Google):[23]

(195) I have no idea whatever it was they were looking for, but they didn't seem to find it.

(196) I have no idea whatever happened to the large ones in my math classrooms that were nearly as long as the blackboard, but I'd like to think they ended up somewhere.

What this data suggests is that the problem is not with "-ever" in an interrogative structure, but something about the attitude verbs that select for embedded interrogatives.[24]

There are, of course, "wh" constructions that completely disallow "-ever" in English. For example, it is completely out in exclamatives and restrictive relatives.

(197) * Whatever a nice day it is!

(198) * However nice a day it is!

(199) * The student whoever talked to Alfonso is in your office.

(200) * The reason whyever Alfonso talked to Joanna is inscrutible.

So, the presence of "-ever" is a reliable test for *some* "wh"-constructions, but does not distinguish between the ones at issue here.

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[23] Baker's 1968 tests can be used here to show that these are truly questions. See later in this section for discussion of these tests.

[24] Supposing that this isn't correct (since the data is shaky), the main cause for concern this data would raise for an interrogative analysis of constituent unconditionals is that they aren't exactly a root phenomenon themselves, yet "-ever" is not just licensed but required. I have two responses for this. The first is that, if constituent unconditionals are interrogatives, they will denote a question meaning, but the way this question meaning is going to be used compositionally is completely different than that of a question meaning embedded under an attitude verb. What this meaning involves, I spell out in chapter 3, and in chapter 4 I give a unified meaning to "-ever" in unconditionals, free relatives, and interrogatives. It is this difference in the way the question meaning is used which results in different licensing conditions for "-ever".

In summary, the presence of "-ever" in constituent unconditionals does not clearly tell us anything about their structure. If "-ever" were absent, it would tell us quite a bit. If it were optional, we would not be able to distinguish between an interrogative and a free relative analysis on this basis. The fact that it is obligatory does not match up with any "wh-" construction in English, and therefore provides a challenge for any analysis, interrogative and FR analyses included.

Echo questioning unconditionals Jespersen 1909–1949 notes that when a question is formed off an interrogative clause (i.e. the gap is in a position where we normally find such a clause), the "wh"-pronoun chosen must be "what". In contrast, when an interrogative is formed off of a free relative, the "wh"-pronoun must match the pronoun in the free relative. This restriction on pronoun choice is true both for normal interrogatives and echo questions. This can be used as a rather effective test to distinguish free relatives and interrogative clauses (see Baker 1968, 1970, and for some recent discussion, Caponigro 2003.) I use small capitals here to indicate the stress pattern associated with echo questions:

(201) A: Alfonso knows who Joanna talked to.
B: What does Alfonso know? / Alfonso knows WHAT?
B': * Who does Alfonso know? / Alfonso knows WHO?

(202) A: Alfonso talked to whoever Joanna did.
B: * What did Alfonso talk to? / Alfonso talked to WHAT?
B': Who did Alfonso talk to? / Alfonso talked to WHO?

This test is difficult to apply directly to unconditionals, because it is not so easy to form an interrogative off of an unconditional adjunct. Similarly, an echoic "wh"-pronoun cannot simply be substituted for the unconditional, even if it is a "wh-ever" item. What we can do is apply a variation of the echo question version of this test, by using a headed unconditional in the echo. Remarkably, it is possible to form echo questions in this way.[25]

(203) A: Whoever Joanna talked to, Alfonso will be jealous.
B: Alfonso will be jealous regardless of WHAT?
B': * Alfonso will be jealous regardless of WHO?

Because the content of a headed unconditional is more clearly interrogative (see §2.1.7 below), this test might be construed as doing nothing more than confirming that headed unconditionals are interrogative. However, I think that the echo question data in (203) is in fact convincing; to see why requires delving into why the test works as it does. The general question is what constraints there are on the form of an echo question, and why.

Following Artstein 2002, I take it that echo questions are subject to a *givenness* requirement. (Artstein follows Schwarzschild 1999, who proposes this requirement for regular questions,

[25] I use "regardless of" here because "no matter what" is already a fixed idiom, and interferes.

so consequently the Jespersen test applies there as well.) What this means is that an echo question is constrained by the information structure of the preceding discourse. The givenness requirement for an echo question is, roughly, that following must be entailed by the context: the existential closure of the echo question, with any "wh"-items (actually, focused items in general) treated as variables with the items' regular presuppositions. For example, the following echo question is inappropriate because it would require the context to entail that speaker A saw a person. (The presupposition of "who" gets imported into the givenness requirement.)

(204) A: I saw a kangaroo in the cafeteria today.
B: # You saw WHO?

Artstein does not discuss echo questions formed off of embedded interrogatives, but this analysis allows Artstein to unify a large class of echo questions, including echo questions not involving "wh"-items, echo questions formed off linguistic objects smaller than a word, echo questions that are metalinguistic in nature, and second-order echo questions formed off of direct questions. In all of these cases, the form of the echo, including constraints on the choice of "wh"-pronoun if there is one, is governed by the information structure of preceding discourse. A key point for us is that the presuppositions of "what" are compatible with reference to abstract entities, such as propositions, events, and even question meanings, but a word like "who" is not. Further, "what" is not typically used for human antecedents. This is why, in the complement of an attitude verb, "what" is the echo word of choice even for a "who" question; the denotation involved is an abstract entity (a question meaning), not an individual. In Artstein's data, this is also important, as we also see "what" anteceded by sub-word elements in echo questions: "Bill is a WHAT-dontist?".

The consequence is that under Artstein's analysis, B's echo question in (203) is subject to such a givenness requirement. Effectively, the prior context must entail that Alfonso will be jealous regardless of the resolution of some issue. The "whoever" unconditional uttered by A puts the context into such a state, licensing the "regardless of" echo unconditional. The use of "what" in the echo indicates that the discourse makes given a question-meaning, not a free relative meaning. If it were a free relative meaning that were given, we'd expect the "regardless of" echo not to be licensed. (It is also remarkable that the meaning of "regardless of" phrases is close enough to bare unconditionals to license this kind of echo question in the first place.)

There is a potential further expectation if our analysis of unconditionals involves a DP or free relative structure. We might expect a response like B′ in (203) to be licensed, with "regardless of WHO". It clearly isn't – does this add to the argument? This structure is in general a possibility because "regardless of" is ambiguous; when it takes an DP meaning it has a concessive meaning something like "despite", as in "I am leaving this room somehow, regardless of/despite the lock." A concessive interpretation, following the "whoever" unconditional, is clearly not possible. However, since a FR analysis of "wh-ever" unconditionals would still have to involve an unconditional, not concessive meaning in the end, "regardless of who" might be ruled out independently by the givenness requirement. This is because givenness is about the overall meaning, not the compositional derivation of it. If unconditionals uniformly involved

free relative structures, we might expect the B′ response to be licensed, so this data does serve to tell us that this is not the case. (Of course, as we will see later in this chapter, it is very clear for independent reasons that headed unconditionals involve interrogative structure, much clearer than for non-headed unconditionals.)

The fact that the "regardless of WHAT" echo is licensed in the first place, once we understand the nature of Jespersen's test, provides a convincing argument that "wh-ever" unconditionals involve an interrogative meaning, and therefore an interrogative structure. In general, this data provides a strong piece of evidence that headed and headless unconditionals are closely related.

Multiple "wh" in unconditionals Izvorski 2000a,b assumes that constituent unconditional adjuncts are free relatives. This leads to a number of problems, and then to the proposal that they are a special kind of free relative that has a CP category, and a propositional semantics. Izvorski does not give evidence that unconditionals involve free relatives, but takes it as a given. I do not argue that if these assumptions were to be made, we would have to conclude that unconditional adjuncts (and free relatives) have a CP structure and semantics; however, this conclusion even in the face of the FR assumption suggests to me that the FR assumption is wrong. In fact, it seems plausible that the FR assumption is wrong for a number of other languages discussed by Izvorski. Izvorski's arguments can be reinterpreted as arguments simply about the category of "wh-ever" adjuncts, and then they become important here.

Izvorski discusses three arguments against treating "wh-ever" adjuncts as CPs that are directly relevant to my aims here. The most important argument concerns multiple "wh" in such adjuncts. Another, which I will not go into much detail on, is that if a DP were adjoined, we'd expect it to compose with the main clause in a different way than it does. I will discuss a slightly more general version of this test that has been touched on by a number of researchers. A third argument is that, for various reasons, it is not plausible that DPs are ever adjoined. This argument may be cross-linguistically blunted by DP-like correlative structures, but it can be applied to English in particular.

Izvorski 2000a notes that there are languages, such as Bulgarian, that allow multiple-"wh" in similar constructions. This is problematic on theoretical grounds for any analysis of free relatives; this sort of free relative would have to have multiple heads. Izvorski 2000b takes the argument a bit further, pointing out that English allows multiple unconditionals. (Grosu 2003 independently makes this point about unconditionals; the use of multiple "wh" as a test for distinguishing FRs from interrogatives goes back to Baker 1968, 1970).

As a baseline, multiple-"wh" is completely out in English free relatives. (In fact, I do not know of any language where it is possible in an argument-position FR construction.) Multiple-"wh" is of course possible in interrogatives.

(205) * Alfonso talked to who(ever) said what.

(206) Alfonso knows who said what.

Izvorski 2000b, Huddleston and Pullum 2002 (ch. 11 §5.3.6) and Grosu 2003 observe that English unconditionals in fact allow multiple "wh". Gawron 2001 also notes this but for

different reasons, and doesn't discuss the consequences for the syntax of unconditionals. The following is Gawron's example, and the example from Huddleston and Pullum 2002 (their '?'):

(207) Whoever buys whoever's property, the town council will still grant a building permit. (Gawron)

(208) ? Whoever said what to whom, we've got to put this incident behind us and work together as a team. (CGEL)

Interestingly, Huddleston and Pullum 2002 claim that with multiple "-ever"s, multiple "wh"-examples are not grammatical (again, the '*' is theirs):

(209) * Whoever said whatever to whomever, we've got to put this incident behind us and work together as a team.

Neither I nor my informants agree with this judgement (in fact, one informant prefers the 3-"-ever" version, though I do not share this intuition). As Huddleston and Pullum 2002 point out, it does seem preferred in general to use a headed unconditional for the same meaning:

(210) No matter who said what to who(m), we've got to put this incident behind us and work together as a team.

In view of the way FRs work in English, this data would be completely unexpected on an account of unconditional adjuncts as free relatives. It is also completely unexpected on an account of unconditional adjuncts as DPs where the "wh-ever" item serves as the head – it should not be possible for DPs to be multiply headed. So while Izvorski 2000a,b concludes from this kind of data that FRs must be CPs, I conclude here only that unconditional adjuncts must be CPs, and that they don't pattern with free relatives in English.

With respect to the correlative question, this data is less helpful. This is because languages with correlatives do allow multiple relative pronouns in the correlative, even when they don't in other relative structures (Srivastav 1991a; Dayal 1996; Bhatt 2003). Hindi is the example that has been most discussed (example from Srivastav 1991a):

(211) jis laRkiiNE$_i$ jis laRkeKO$_j$ dekhaa usNE$_i$ usKO$_j$ passand kayaa.
REL girl-ERG REL boy-ACC saw DEM-ERG DEM-ACC liked
Which girl saw which boy, she liked him.

We can clearly see from the relative morphology that this is a relative structure with multiple relative pronouns. In fact, multiple correlatives in Hindi are subject to the same kind of marginality and speaker variation we have seen with multiple unconditionals in English (Pranav Anand, p.c.).

The multiple-"wh" data is an argument against the unconditional structure being the same as any other English relative construction, and against a DP structure. Unconditionals cannot involve a complete free relative, which would be a DP structure. However, the data is compatible with a correlative analysis, as long as we assume that a correlative is a CP. To determine whether English unconditionals resemble correlatives, we will need to turn to the relation of the adjunct to any main-clause pronominals; I will discuss this shortly.

DP-type meanings A second argument suggested by Izvorski 2000a,b against a DP account of "wh-ever" adjuncts is that constituent interrogative adjuncts seem more plausibly propositional, i.e. not DP-like, in meaning. That is, they seem like some kind of conditional adjunct. This observation has been made in various ways by a range of researchers (König 1986; Zaefferer 1990, 1991; Izvorski 2000a; Gawron 2001; Huddleston and Pullum 2002). This isn't a purely syntactic argument, but the intuition has been so often expressed, that it must be taken seriously. This intuition speaks against any kind of nominal account of unconditionals.

The basic idea is that constituent unconditionals don't seem referential in the way that we'd expect if they involved some nominal structure. To try to solidify the intuition, it is useful to compare constituent unconditionals with topicalized free relatives:

(212) Whatever Alfonso claimed, Joanna later argued against it.

(213) Whatever Alfonso claimed, Joanna later argued against.

These two sentences mean roughly the same thing, in terms of truth-conditions. However, there is a significant intuitive difference in their meaning. The example in (212) is somehow more quantificational, whereas the example in (213) is somehow more referential. Another way to try to express this intuition is that the second example has a paraphrase along the lines of: "Those claims Alfonso made? Joanna later argued against each of them." The first example does not seem to have this paraphrase, even though in the end it has a very similar meaning. This distinction, though hard to explain, is a relatively reliable intuition, and would be unexpected on a DP account.

DPs as adjuncts Izvorski 2000a,b notes that it is theoretically implausible for DPs to adjoin. She also notes that it is also empirically surprising in English; few if any DPs are acceptable when adjoined. The theoretical half of this argument is problematic given that in many languages there is a nominal correlative construction. (In fact, if Haspelmath and König 1998 are right, some unconditional constructions involve nominal adjuncts.) In fact, there are a range of other cases that have been proposed as nominal adjuncts, though the class is still relatively limited. The empirical half, as a result about English, is still compelling. There are a few plausible cases of nominal adjuncts in English, but they are quite removed semantically from unconditionals, and have a fairly different distribution. For example, nominal appositives (as in "Alfonso, a famous linguist, visited France last week") have very strict distributional constraints and can only appear adjoined inside a DP (Potts 2003). DP adverbials such as "every day", "a week", and so on, generally have to involve temporal quantification or measuring. Many of these also have a very restricted distribution (Morzycki 2001, 2004); measure adverbials like "a week" can only appear sentence finally in a fairly low adjunction position. Unconditional adjuncts do not appear even remotely like any of the known cases of DP adjunction in English.

Question substitution There is another very simple observation about constituent unconditionals that can serve as a test. This is based on a test for free relatives given in Caponigro 2003, that constituent interrogative clauses can be generally substituted for polar interrogative

clauses, but free relatives cannot. In the domain of embedded interrogatives, an alternative interrogative clause would do just as well as the substitution, for purposes of this test. In the case of unconditionals, we can of course substitute an alternative interrogative clause for a constituent unconditional adjunct. Both constructions have similar meanings, and the adjuncts appear in the same place. No clear case of a "wh-ever" free relative appears in the same distributional slot as an alternative interrogative in other parts of the language.

This argument does require accepting the intuition that the alternative and constituent unconditionals are the "same" in some way – an intuition that a wide range of researchers have accepted.

The external distribution of free relatives Grosu 2003 (fn. 1) adds two more tests to the mix. Both of these lead to the conclusion that "wh-ever" adjuncts are not free relatives.

The first test concerns the external distribution of free relatives. The distribution of a free relative corresponds (roughly) to the kind of gap or "wh-word" that is inside the FR. That is, adverbial "wh"-words inside a free relative lead to an adverbial FR, and nominal "wh"-words lead to a nominal FR. The following sentences (from Grosu) illustrate this point:

(214) I'll sing whatever you want me to sing.

(215) I'll sing however you want me to sing.

The "whatever" FR in the first example fills the Theme role for the verb "sing". The "however" FR, on the other hand, is an adverb that describes the manner of singing, and does not fill any thematic role of the verb.[26] Interrogative clauses, on the other hand, do not change their external distribution to match the kind of "wh-"word involved:

(216) Alfonso knows what you want him to sing.

(217) Alfonso knows how you want him to sing.

Despite the "what" vs. "how" distinction, and the fact that the gap is in argument position in the first example, and adjunct position in the second, both interrogative clauses are arguments to "know".

Unconditionals quite obviously pattern with interrogatives in this respect. They are in adjunct position regardless of the nature of their "wh"-word or gap.

(218) Whatever you want me to sing, I'll do a good job.

(219) However you want me to sing, I'll do a good job.

This observation strongly suggests that unconditional adjuncts are not free relatives.

[26] To see that this is a FR, not a right-adjoined unconditional, consider the version without "-ever".

The matching test The second test from Grosu 2003 involves matching effects in free relatives. A matching effect is a case where a free relative is subject to restrictions on mismatches between external and internal properties. In many languages matching effects involve case; in English they involve PP vs. DP mismatches. In fact, the English data basically boils down to an observation about pied piping, though matching effects go well beyond pied piping. The point is that pied piping is not possible in a FR that occupies a DP's position, whereas it is possible in an unconditional. This is also a case where FRs differ from headed relative clauses, which allow pied piping. See also Huddleston and Pullum 2002 for discussion of the pied piping facts. The following data are modified from Grosu:

(220) In whatever handwriting you forge your report, you won't be able to avoid detection.

(221) I intend to imitate whatever handwriting you forged your report in.

(222) * I intend to imitate in whatever handwriting you forged your report.

While this test is not very robust in English, since matching effects aren't very robust, it might be useful in languages where there are more robust case matching effects in FRs, for distinguishing between correlative and unconditional analyses of such constructions. Even in English, it strongly suggests an interrogative analysis.

The question idiom test One simple but compelling test due to Huddleston and Pullum 2002 (§5.3.6 fn. 17; see also Pullum 1973; Kay and Fillmore 1999 for discussion of this construction in general) is based on the idiom illustrated in (223):

(223) What were they doing reading her mail?

This kind of question can be paraphrased with "why" or "what for", as in "why were they reading her mail?", or "what were they reading her mail for?". Huddleston and Pullum 2002 note that it is disallowed in free relatives, but allowed in unconditionals. (Examples adapted from there.)

(224) * She didn't complain about whatever they were doing reading her mail.

(225) Whatever they were doing reading her mail, it didn't lead to any legal problems.

The conclusion is that since this idiom is limited to interrogatives, unconditionals must be interrogatives. In general, the interrogative analysis makes the prediction that idiomatic interrogative structures that aren't licensed in FRs would be licensed in unconditionals.

Correlatives, proforms, and the correlation requirement At this point, we have established that constituent unconditional adjuncts are interrogative CPs, and that they are not free relatives. If they are not free relatives, they are not likely to be correlative adjuncts. There is an additional argument suggesting they are not correlatives; this is that they needn't occur with a proform. Correlatives in Hindi have a requirement that has been very clearly discussed by a number of researchers (Dayal 1996; Bhatt 2003). I will call this the correlation requirement:

(226) **The correlation requirement in correlatives**
Every relative pronoun in a correlative adjunct must have a corresponding proform in the main clause.

English constituent unconditionals are fine without a correlated proform in the main clause:

(227) Whatever Alfonso said, Joanna got mad.

(228) Whoever brought the beer, it is a good brand.

(229) Whoever talks to Joanna, she will be irritable.

Examples like this are productive and common.

It is of course true that "wh-ever" adjuncts can antecede pronouns. Gawron 2001 suggests that such adjuncts are DP-like in this respect. However, the fact that a "wh-ever" adjunct can antecede pronouns does not distinguish between a free relative/correlative/nominal analysis and an interrogative analysis. The reason is that all interrogatives can antecede pronouns:

(230) Who is Alfonso talking to? She looks really bored.

(231) Henry wondered who Alfonso was talking to. She looked really bored.

(232) What is Alfonso eating? I want some of that dish too.

(233) Henry wondered what Alfonso was eating – it looked tasty.

(234) If Alfonso knows what Joanna is working on, he tries to help her with it.

Languages typically impose a more specific version of the correlation requirement than what I describe above; they tend to impose some restriction on the kind of proform that can be correlated with the correlative adjunct. The requirement varies by language. Hindi generally requires a demonstrative, though certain other kinds of proforms are possible . In English, "wh-ever" adjuncts can antecede any kind of DP proform at all:

(235) Whatever Alfonso says, Joanna argues against it.

(236) Whoever Alfonso talks to, he tries to convert that person to linux.

(237) Whoever Alfonso talks to, he tries to convert the poor bastard to linux.

The fact that there is no restriction on the kind of proform involved argues against a correlative analysis. The pattern is exactly the same as with regular interrogative antecedents, or regular DP antecedents – any proform is licensed (up to agreement).

There are analyses of certain kinds of correlatives that (apparently) do not impose the correlation requirement. In particular, Bhatt and Pancheva's 2006 analysis of English "if"-clauses as correlatives does not require a corresponding proform, or at least not an overt one, in all cases. The fact is that "then", which they argue is the relevant proform, is not compatible with all "if"-clauses, because of its presuppositions (see Iatridou 1991; von Fintel 1994, and Izvorski 1996 on correlative proforms in general). So obviously the correlation requirement can't apply to "if"-clauses, if they are correlatives. One possibility of course is that when there

is no overt "then", there is a covert world pronoun in its place, a sort of adverbial "pro". Any binding-based analysis of "if"-clauses will require them to bind a domain variable for the relevant operator in any case, so this idea is plausible from that perspective. In any case, there is no "pro" in English unconditionals where the "wh-ever" phrase does not bind a proform, and so the correlation requirement cannot even apply in this sense to English unconditionals.

In summary, the fact that unconditionals need not antecede a pronoun suggests that they are not correlatives. The fact that they can antecede a pronoun does not provide evidence one way or the other; the kinds of pronouns allowed suggests again that they are not correlatives. One further point: if a language has a so-called correlative construction that does not impose a correlation requirement, and does not require any particular kind of proform as a correlate, we should suspect that it involves an unconditional construction rather than a correlative construction.

The distribution of "wh-"items The evidence so far is overwhelmingly in favor of an interrogative non-correlative analysis of unconditionals. However, there is one test by which unconditional adjuncts do not quite pattern with interrogatives.

Baker 1968, 1970 notes that the range of "wh"-items allowed in a construction can distinguish interrogatives from plain free relatives. For instance, there are no plain free relatives formed off of "whose". This is not immediately helpful to the question of distinguish unconditionals and free relatives, however, since "-ever" free relatives allow many more "wh"-items than plain free relatives, and in fact the only one they don't allow is "whyever". ("Whose" becomes "whoever's" in most dialects.) Caponigro 2003 suggests that this is a universal gap in free relative inventories – if a language has a monomorphemic pronoun meaning "why" that is of the right morphological shape to appear in a free relative, it does not use that pronoun in the free relative construction.

The pronoun "whyever" is marked in unconditionals. The fact is not quite so absolute as in free relatives; there is speaker variation, and examples are occasionally attested. The pronoun is allowed in "-ever" interrogatives much more freely, though even there it is not clear that it is fully unmarked. First, I show several attested examples[27] of root "whyever" questions:[28]

(238) Whyever did we buy these submarines (or any subs at all)?[29]

(239) "But nobody liked them," said Clelia. "Nobody at all." *"Whyever did you buy it then?" said Clara.* "My mother bought it," said Clelia.[30]

(240) "You can ask your parents about John Redburn," Barbara said, and her voice was unusually sharp. "They knew him much better than I did. *Why ever did you go to the*

[27] There is a strong dominance in my corpus searches of examples involving "whyever not". This again suggests that "-ever" is not as productive in "why" questions as it is in root questions in general.

[28] Note that there is an orthographic convention, sometimes ignored, that "why" and "ever" are written with a space between them. It is not clear that there is anything meaningful about this.

[29] From "The Torch", a weblog about the Canadian military, accessed 5/8/2008; via Google.

[30] From *Jerusalem the golden.* Drabble, Margaret. London: Penguin Group, 1988; via the BNC.

funeral?"[31]

(241) "Perhaps she won't come back." *"Why ever not?" said Alice, simply surprised.*[32]

Next, here are some attempts to construct free relative examples with "whyever":

(242) * I am sure he did it whyever she did it. (Caponigro 2003 ch. 4 ex. 6)

(243) * Alfonso went to France whyever Joanna did.

We can see that these examples aren't unconditionals because the meaning of the adjunct is too closely integrated into the argument structure of the main verb. Parallel examples involving "what reason" must appear in a "for"-PP, something that isn't true for unconditionals of that type.

(244) I am sure he did it for whatever reason she did it.

(245) * I am sure he did it whatever reason she did it for.

(246) compare: Whatever reason she did it for, he was not impressed.

Attempting to construct "whyever" unconditionals produces sentences that are typically judged as quite odd by speakers:

(247) * Whyever Alfonso went to France, he ended up staying there.

To see what this example should mean, it is useful to compare it to a headed unconditional, where "why" is allowed, or an unconditional involving "whatever for":

(248) Regardless of why Alfonso went to France, he ended up staying there.

(249) Whatever Alfonso went to France for, he ended up staying there.

However, speakers do accept some examples. For instance, the following example, constructed from an attested example that used "whatever reason", is accepted by some speakers:

(250) Whyever you might be downsizing, upgrading, or buying a second home, building your own home can be a very satisfying and rewarding experience.

Finally, there are even occasional attested examples:[33]

(251) Whyever they began, there was no perceptible wolf at their door.[34]

(252) "And whyever they were doing it, they were the ones responsible for what happened to her and all of the rest of my friends in the first place."[35]

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[31] From *The raven on the water*. Taylor, Andrew. London: Fontana Press, 1992; via the BNC.

[32] From *Tortoise by candlelight*. Bawden, Nina. London: Virago Press Ltd, 1989; via the BNC

[33] These examples were collected on the "en.wiktionary.org" entry for "whyever", accessed 5/8/2008. I have verified them via Google books.

[34] From *Population, Ecology, and Social Evolution*, Steven Polgar, 1975, page 74.

[35] From *Hell's Gate*, David Weber and Linda Evans, 2006.

Most native speakers, including some who don't accept more artificial examples, will accept these. However, when asked, such speakers uniformly prefer similar examples involving "whatever reason...for".

In summary, we have a three-way contrast with respect to "whyever". The combination is out in free relatives. In unconditionals there is inter- and intra-speaker variation. The combination is freer in root questions, but even there it is not entirely colloquial. But since root "-ever" questions in general are not entirely colloquial, it is not clear that we can draw any conclusions from this last point.

Unconditionals do not particularly pattern with free relatives with respect to this data, but it is not entirely obvious that they pattern with interrogatives either. If they patterned with free relatives, we would expect a complete impossibility of "whyever", with no variation. If they patterned with interrogatives, we would expect a freer appearance of "whyever" in unconditionals. The conclusion from this data is that, if unconditionals are to be analysed as interrogatives, there must be some explanation of the restricted and gradiant appearance of "whyever"; similarly for a FR analysis.

Summary The tests are strongly in favor of a CP analysis of constituent unconditionals, and against a nominal/DP analysis. They also favor an interrogative analysis and disfavor a free relative analysis. A connection to correlatives is disfavored as well, both because of the lack of evidence for any kind of relative structure, and because of the data about proforms in the main clause. The conclusion I will take away is that unconditionals are interrogatives.

For reference, the tests I have given in this section are summarized in Table 6.

page	test	category	kind
p. 59	presence of "-ever"	inconclusive	inconclusive
p. 61	echo questioning	CP	interrogative
p. 63	multiple-"wh"	CP	inconclusive (not FR though)
p. 65	DP meaning	CP	interrogative
p. 65	DP adjunction	CP	interrogative
p. 65	question substitution	CP	interrogative
p. 66	external distribution	CP	interrogative
p. 67	matching	CP	interrogative
p. 67	question idiom	CP	interrogative
p. 67	proform	-	not correlative
p. 69	"wh"-item distribution	inconclusive	not int. or FR

Table 6: Summary of tests for constituent unconditionals

2.1.4 The third category analysis

Before leaving the topic, there is one other possibility, which I will call the "third category" hypothesis. The evidence I have given here is by and large compatible with unconditionals involving structures that are separate from, and closely related to, both interrogatives and "wh-ever" free relatives. Semantically, this makes no real predictions, since this would amount to a new kind of "wh"-construction, in e.g. the sense that exclamatives are a different kind of "wh"-construction from interrogatives. Therefore it might be suspicious that an interrogative semantics provides the right results; the idea of there being a third category, while plausible, is just too broad to motivate.

However, this hypothesis can be made more specific. Suppose we adopt a theory of free relatives where they consist of a DP structure containing a CP complement to a null head (e.g. the analysis of Caponigro 2000 or Grosu 2003). Suppose further, that this CP has basically an interrogative semantics, and the null determiner imposes some other requirements on top of the interrogative semantics. Then, it might be plausible to say that the structure in a "wh-ever" adjunct is this kind of CP. This would also provide the beginnings of a reason for the distinction between "whyever" in unconditionals, and in interrogatives/FRs. "Whyever" would be marked in unconditionals for whatever reason it is out in "wh-ever" free relative CPs; the challenge would be to explain the distinction in markedness. The incomplete FR proposal is relatively adaptable; for instance, it seems to me that it is compatible with a proposal like Caponigro 2003 where a FR is a CP that gets type-shifted into a DP-type meaning. An unconditional would involve the CP without this typeshift. The incomplete FR analysis would also provide a connection to the syntax of Gawron 2001, which derives alternatives, unconditionals, and "-ever" FRs from pre-questions, a way of thinking about an incomplete FR.

The tests I have gone through in this section do not clearly support or disprove the third-category hypothesis, though on balance they seem against it. The only tests that seem in favor of it are the "wh"-item distribution test (p. 69 and to some extent, the multiple-"wh" data (p. 63). The "why" gap suggests a similarity to free relatives that is hard to do away with, but the pattern is still not quite the same. The multiple-"wh" data supports the third category analysis insofar as it allows a unification of correlative constructions and unconditionals in English; the speaker variation/uncertainty about the scope of the multiple-"wh" data suggests this possibility. However, I would not want to draw more conclusions from it without further investigation of the speaker variability in both English and Hindi.

The results of the echo questioning test (p. 61), the question substitution test (p. 65), and the question idiom test (p. 67) are clearly on the side of an interrogative analysis. These all involve facts that the third-category analysis would have to explain away somehow, and in particular, the data in the question idiom test seems quite difficult. The proform test does not support the third-category analysis, insofar as the third-category analysis represents a unification of unconditionals and correlatives.

Additionally, the interrogative explanation seems simpler, as it involves a known and uncontroversial category for unconditional adjuncts, and makes very explicit predictions about the semantics. We will see in the next chapter that those predictions lead to a satisfying account

of unconditionals. The third-category analysis does not make any real semantic predictions, though of course it leaves more room for flexibility in the analysis.

Zaefferer 1991 notes that it is common for unconditional constructions to involve interrogative adjuncts, so an interrogative analysis is typologically unsurprising. The detailed typological study in Haspelmath and König 1998 specifies this further: virtually all instances of constituent unconditionals in their survey of 40 languages involve interrogative pronouns (One kind of unconditional in Irish, along with degree unconditionals in German, French, and Romance more generally are the exceptions). However, Haspelmath and König do note that a free relative analysis is plausible in some of these languages, and is not straightfoward to rule out across the board. Even some languages with constructions that look superficially like English "no matter"-type constructions allow these clauses in argument position; in English such clauses undeniably involve interrogative clauses, and are only allowed in adjunct position. See Lin 1996, Haspelmath 1997 §6.2.4, and Zabbal 2004 for various cases. Unfortunately I do not know of any syntactic discussions of such constructions.

The only real typological conclusion at present is that much difficult language-particular work will need to be done to really disentangle FR/correlative analyses, interrogative analyses, and third-category analyses of unconditionals from a cross-linguistic perspective. For English, I think the third category analysis, while not completely dead in the water, is quite implausible, and would need significant motivation to be revived. I will adopt the interrogative analysis for the remainder of the dissertation.

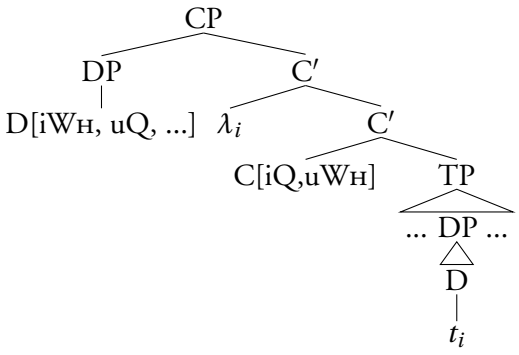
2.1.5 The structure of a constituent interrogative

Where settling on an analysis for the structure of alternative interrogatives that also meshes with Hamblin semantics was not straightforward, settling on one for constituent interrogatives is very straightforward. This is for the reason that Hamblin's 1973 original Hamblin semantics was tailor-made for constituent interrogatives.

I will follow the semantic analysis of A′ movement from Heim and Kratzer 1998, and give a relatively standard implementation of the syntax in minimalist terms. "Wh"-phrases, including "wh-ever" phrases, are merged(/base-generated) in whatever position their category is normally merged in; for DPs this is in argument position. A "wh"-phrase carries an interpretable [WH] and an uninterpretable [Q] feature, as well as further features needed to differentiate different items. (See the next section for pronouns involving "-ever".) In a constituent interrogative, the C position contains an uninterpretable [WH] feature and an interpretable [Q] feature. In order for its features to be valued before LF, the "wh"-phrase moves to SpecCP, and we are left with interpretable [Q] and WH features, on the C and "wh"-phrase respectively.

The syntactico-semantic assumptions, from Heim and Kratzer, are that (i) the "wh"-DP starts off indexed, (ii) this movement strips the DP of its index and leaves a copy of the index as both (iii) an index on the trace and (iv) an index on a new λ operator adjoined to C′. Thus, we have an LF structure as in (253).

(253)



The missing piece at this point is an analysis of the structural role of "-ever". I turn to this now.

2.1.6 The morphosyntax of "-ever"

In this section, I discuss the distributional and morphological properties of "-ever". Stepping back from unconditionals, I use evidence from a range of constructions involving "-ever"; it is only from this perspective that we have enough information to decide on an analysis. A common, though typically implicit, view of "-ever" is that it is a suffix on "wh"-items. While there is something to this view, I will argue that it is not quite right. The distribution of "-ever" is both freer and more constrained than we would expect if it were a simple suffix.

For much of this section I will be talking pre-theoretically about "constructions" that involve "wh"-pronouns. I do not mean, by such talk, to presuppose any particular theoretical machinery behind the notion of a construction, but rather to refer to classes of sentences that descriptively form such constructions as interrogatives, free relatives, relative clauses, exclamatives, and so on. Of course, when I give the formal analysis of the distribution of "-ever", I will then introduce some machinery that corresponds to these notions, but the arguments I give here are to some degree independent of such a notion.

"wh"-pronouns across constructions Of the constructions that involve "wh"-morphology, "-ever" can appear in three. These are root interrogatives, unconditionals and free relatives.

(254) Whoever could have done that?

(255) Whoever did that, we should applaud their efforts.

(256) We have to catch whoever did that.

Constructions that do not allow "-ever" but involve "wh-" morphology include relative clauses, exclamatives, and specificational pseudo-clefts.

(257) * Alfonso was talking to the doctor whoever is friends with Joanna.

(258) * Whatever a nice day it is!

(259) * Alfonso is whoever Joanna is dating.

The conclusion we can draw from this is that "-ever" is not so much licensed by particular "wh"-words, but on a "construction by construction" basis.

Root interrogatives seem to freely allow "-ever". That is, every "wh"-pronoun in English can occur in an interrogative clause, and every one can co-occur with "-ever".

It is not clear that "wh-ever" free relatives freely allow "-ever". First, there is a clear gap in "whyever", which cannot be used in a free relative (Caponigro 2003). We also find this gap in unconditionals.

(260) a. * Alfonso was dancing whyever Joanna told him to.
b. cf. Alfonso was dancing for whatever reason Joanna told him to.

(261) a. * Whyever Alfonso did that, he should have thought it out ahead of time.
b. cf. No matter why Alfonso did that, he should have thought it out ahead of time.

Second, plain FRs allow only a much more restricted set of "wh"-pronouns than those with "-ever". They only allow "who", "what", "when", and "where", whereas when "-ever" is present, any "wh"-pronoun except "why" can be used. In fact, this might lead us to wonder if the two are really instances of the same free relative "construction"; see discussion in the appendix (§2-A) and Gawron 2001 for some further distinctions between the two that "ever" leads to. If this were the case, in fact "wh-ever" FRs would require "-ever", in some sense.

Bare constituent unconditionals cannot appear without "-ever". Conversely, headed constituent unconditionals sound odd or redundant when they do have "-ever".

(262) Whoever Alfonso talked to, he got mad.

(263) * Who Alfonso talked to, he got mad.

(264) No matter who Alfonso talked to, he got mad.

(265) # No matter whoever Alfonso talked to, he got mad.

Embedded interrogatives do not generally seem to allow "-ever". However, there is apparently some gradience here, unlike e.g. the relative clause case. These are better the more the question embedding predicate emphasizes lack of knowledge. Also, "it"-clefting, which we will see later tends to force ignorance readings, improves examples which permit lack of speaker certainty. (Note that the "know" examples have a competing free relative interpretation; I have attempted to rule this out by the use of "could" here.)

(266) a. ? I have no idea whatever Alfonso could be saying to that woman.
b. ?? I wonder whatever Alfonso could be saying to that woman.
c. # I know whatever Alfonso could be saying to that woman.

(267) a. I have no idea whatever it is that Alfonso could be saying to that woman.
b. ? I wonder whatever it is that Alfonso could be saying to that woman.

c. # I know whatever it is that Alfonso could be saying to that woman.

From this data we can conclude that the distribution of "-ever" is potentially constrained by the semantic environment it appears in. The preceding sequence of data also strengthens the conclusion that it is the "construction" (in whatever sense one assumes there are constructions) that licenses the presence of "-ever", not particular "wh"-words. The "wh"-words don't seem to care at all. Further, it doesn't seem that "-ever" selects for particular "wh"-words either, given its distribution in root interrogatives. The one potential case is the "whyever" gap, which Caponigro 2003 suggests may be a universal property of all free relatives. It is possible that "-ever" is incompatible with "why", but if Caponigro is right, the gap is not at all specific to an analysis of "-ever". We may want some technical machinery that can describe the gap, but an analysis of "-ever" will not be the domain of the *explanation* of the gap.[36]

The position of "-ever" within a "wh" phrase The most promising reason for thinking of "-ever" as a suffix is simply that it appears attached solely to "wh"-pronouns. In most dialects of English, we can be sure that it is the closest element to the "wh"-pronoun, because of its distribution with respect to "wh" epithets, possessive marking, and "else". It always appears to the left of these items. We can also look at "wh"-pronouns that take an NP sister; "-ever" appears to the left of that. I will focus on unconditionals here, but this data transfers to the other two constructions.

(268) a. Whoever the hell else's sister you yelled at, you had better apologize to her too.
b. Who the hell (*ever) else (*ever)'s (*ever) sister you yelled at, you had better apologize to her too.

(269) a. Whichever book you're going to read, you'd better choose soon.
b. * Which book ever you're going to read, you'd better choose soon.

(270) a. However tall Joanna got as she grew, she still couldn't reach the cookie jar.
b. * How tall ever Joanna got as she grew, she still couldn't reach the cookie jar.

The reason I mentioned dialect variation above is that there is apparently some variation on the position of the possessive marker (Gawron 2001). In some dialects (which I take to be more common[37]) we find "whoever's", and in some dialects, we find "whosever". It is not clear that the second form involves an independent possessive morpheme sandwiched between

[36] I will not offer such an explanation here. In general, we will want explanations of the restrictions on interrogative pronouns in a range of constructions in English and cross-linguistically, and it is not at all clear what the domain of these explanations might be. In English, nearly every construction that involves "wh"-pronouns uses a slightly different subset of them.

[37] A google search reveals an order of magnitude more results for the first form. However, many of these involve a reduced "is", not a possessive structure, so it is not clear that the difference is quite so stark. A similar fact holds for the BNC and the BYU corpus of American English (Davies 2004-, 2008-); however, in neither of these corpora is the possessive marker following a "wh-ever" pronoun tagged appropriately, and I have not separated out the reduced copular cases.

"who" and "-ever". The reason is that we don't (as far as I know) ever find "whatsever" or "whichsever"[38] The specificity of this variation to "who" suggests that the point of dialect variation is whether "whose" is a single "wh"-pronoun lexicalizing possession, or whether it is decomposable and consists of "who" and "'s", the second marking the entire phrase. Most speakers of English speak a dialect with the second system. I do not know the status of the other tests used above in such dialects.

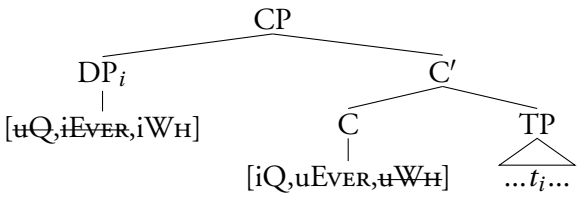
We don't find any kind of suppletion in the "wh-ever" paradigm, and we don't find any kind of variation across the different constructions that allow "wh-ever" pronouns.

In summary, "-ever" is very closely associated with "wh"-pronouns, in a way that is suggestive of affixation. It is clearly not a clitic or an independent word, given the above data in light of the commonly used tests (Zwicky and Pullum 1983; Zwicky 1985). This association does appear to be somewhat more regular than we might expect from affixation in general.

Analysis An analysis of the morphosyntax of "-ever" must capture two competing distributional facts: (i) its close, affix-like association with "wh"-pronouns, and (ii) its licensing conditions, which appear to have nothing to do with the "wh"-pronouns themselves, and everything to do with the "construction" that the pronouns appear in.

My proposal to resolve these competing factors is that "-ever" is a reflex of an Agree relationship with the C in whose specifier it appears. The structure this would involve, after movement, is shown schematically in (271).

(271)



On this proposal, "wh-ever" items are extensions of the standard symmetric Agree relationship assumed in much recent work; they are extended with another feature of the same sort we already see. An interesting point is that the standard minimalist feature system does not deal gracefully with this array of features, given my aims. What we want is for the presence of an Ever feature on C to determine all and only those cases where a "wh-ever" pronoun appears in the specifier. But because Ever on the "wh"-item is intepretable, simply placing the uninterpretable version on C does not prevent it from appearing in other constructions – it simply requires it in this construction.

The solution is to relax the biconditional relationship between interpretability and valuation, following Pesetsky and Torrego 2007. I will therefore assume that the iEver feature on a "wh"-pronoun is unvalued when it is merged, and therefore that a derivation will crash if a uEver C does not show up to value the feature.

[38] A google search does turn up about 10000 hits for the first one. However, as far as I can tell, all of these involve typos from "whatsoever", or references to a particular song that is named "whatsever". A search of the BNC reveals no instances of either word.

The construction-by-construction licensing is now captured by the different kinds of Cs in English. That is, under this system, a clausal "construction" amounts to a set of features on C, and some combinations are not compatible with uEver. In chapter 4 I turn to the question of how the iEver feature is interpreted.

Finally, we must explain the close connection of this feature with "wh"-pronouns. There are two ways to go here. One is to assume that there are simply two sets of "wh"-pronouns in the lexicon, one set with uEver and one without. Then, some principle like Distributed Morphology's Subset Principle (Halle 1997) would arrange to insert the pronoun that most closely matches the feature structure. While simple, this does not capture the generalization that "wh-ever" items seem to be uniformly morphologically transparent. Such a generalization could perhaps be captured diachronically, but an alternative approach would be to assume that there is in fact some structure present. That is, "-ever" might be merged as a sister to the interrogative pronoun at the sub-word level. Alternatively, if morphology is post-syntactic, the feature uEver might trigger the insertion of "-ever" as a disassociated morpheme at that stage. The choice between these analyses does not concern me further here.

There are three distributional facts I have not addressed: (i) the difficulty of multiple "wh" with root "-ever" questions, (ii) the difficulty of embedding "-ever" questions, and (iii) the requirement for "-ever" in constituent unconditionals. To solve the first two problems, we need a semantics for "-ever" questions. In chapter 4, I address the third question, arguing that synchronically this is a lexical fact about the feature driving the appearance of clausal adjuncts in complement position. Diachronically, it is the result of a pressure for low "bias" in the clauses used to form unconditionals.

This closes the analysis of the internal structure of constituent unconditionals. I have argued that they involve a normal interrogative structure with the addition of features determining the appearance of "-ever" on the interrogative pronoun. Importantly, the interpretable instance of this feature appears on the complementizer. I turn now to the internal structure of headed unconditionals.

2.1.7 Headed unconditionals

English has two kinds of headed unconditionals, those involving "no matter" and those involving "regardless of". There are also several related fixed constructions: "no matter what", and plain "regardless".[39]

There are two questions to settle about the syntax of these structures. First, what the status is of the fixed parts, and second, what the status is of the content. I discuss each of these in turn. First, I will discuss some complications with "regardless of" that must be factored out.

[39] Huddleston and Pullum 2002 group two more adverbial constructions with these: "independently" adverbials and "irrespective" adverbials. It is not clear to me that either are true unconditionals, in that they do not give rise to the "indifference implication" I discuss in the next chapter. However, they still may have a closely related semantics, without the free choice component. That is, instead of non-adverbial paraphrases involving "it doesn't matter", they might have paraphrases involving "it doesn't depend on."

The "regardless of" construction is actually ambiguous, between an unconditional and a concessive meaning. For present purposes, this is important so that the concessive version can be ignored. The concessive meaning can always be unambiguously paraphrased with a "despite" adjunct, and the concessive "regardless of" shares with "despite" that they both take DPs.

(272) Regardless of Alfonso, I am going to the party.

(273) Despite Alfonso, I am going to the party.

A key difference is that the concessive version is intuitively "factive", though the conventional use of that term doesn't quite apply. What I mean is that in the above examples, Alfonso must be doing or have done something that one would expect to prevent the speaker from going to the party. This is not so with the unconditional version, where there is some issue whose resolution is not yet known:

(274) Regardless of what Alfonso says, I am going to the party.

(Of course, this example also has a potential concessive interpretation, with a FR interpretation for the "wh"-phrase.) The issue is further complicated by the fact that the unconditional version can also take DPs, as long as they are concealed questions:

(275) Regardless of Alfonso's answer, I am going to the party.

On the concessive reading, Alfonso has already given an answer, and the speaker is claiming both (i) the answer would lead to the expectation of them not going, and (ii) they are going. On the unconditional reading, Alfonso's answer is not known, and the speaker will go to the party no matter what the answer is.

For present purposes, the concessive reading should be ignored entirely. I return to the issue of unifying the two in chapter 6.

The structure of the "head" Unfortunately it is not so simple as to say that either "no matter" or "regardless of" is a complementizer. The orthography suggests that they are each two words, and complementizers are typically not two words.

The "no matter" construction seems closely related to the phrase "it doesn't matter", where "matter" is a verb. The verb "matter" takes a question or factive complement, and has a similar syntax to emotive factives. I don't see any obvious reason that this connection is anything other than diachronic. "Regardless" doesn't have any clear synchronic counterpart in any other domain that I know of. It is quite common cross-linguistically for versions of "it doesn't matter"-type expressions to diachronically end up in free choice indefinites (Haspelmath 1997) and in unconditionals (Haspelmath and König 1998).

The words "no" and "matter" do seem to be a unit in the unconditional construction. Neither can appear on its own in an adjunct. I will assume here that they are not synchronically related to their counterparts (the negative answer word and the verb "matter", or the determiner "no" and the noun "matter"), and do form a unit of some kind. The next question is

whether this unit is a word – whether they are one word or two. The orthography suggests two, but this may be a historical artifact. The phonological evidence seems inconclusive; the prosodic structure we find involves the vowel in "no" being characteristically reduced, with stress on the first syllable of "matter". We'd expect this either if "no" is prosodically dependent on the following word (as in "to butter", in "I want to butter the toast"), or if the two formed a single word (e.g. "Tibetan", "notation", "unleaded"). One point in favor of the one-word hypothesis is that in "no better", it is not possible to reduce the vowel in "no". But that "no" may well have a different syntactic, and therefore prosodic, status than the "no" in "no matter". I will assume that "no matter" is one word, and that it is a complementizer, but the evidence for this is somewhat thin.

The case for "regardless of" being two words is somewhat clearer. "Of" in this construction acts prosodically like the regular preposition "of", in requiring a following prosodic host. We might also expect a different stress pattern if it were the final syllable of a single word "regardlessof" – stress should fall on the penultimate syllable. The stress facts are not very conclusive of course, as lexical stress or derivational structure would interfere. Nevertheless, I conclude from this that "regardless" syntactically selects for an "of"-PP as a complement.

What is the category of "regardless" itself? I will assume that it is a complementizer. Again, it is a little hard to tell, and most complementizers don't select a prepositional phrase. An alternative possibility is that it is an adverb; there are adverbs (e.g. "independently", "separately") that take "of"-phrase complements. It could even be a preposition itself. My reasons for choosing "complementizer" from these possibilities are primarily aesthetic, as it makes the construction structurally closer to the other unconditional constructions.

The content Both "no matter" and "regardless" seem to semantically select for a question. Both constructions take the full range of interrogative clauses. Here I show a regular interrogative clause, a multiple-"wh" clause (see discussion of multiple "wh" in §2.1.3, p. 63), and a "why" clause (see discussion of the "why" gap in §2.1.3, p. 69).

(276) a. No matter what Alfonso said, I'm going to the party.
b. No matter what Alfonso said to who(m), people will still be mad.
c. No matter why Alfonso said that, it was still rude.

(277) a. Regardless of what Alfonso said, I'm going to the party.
b. Regardless of what Alfonso said to who(m), people will still be mad.
c. Regardless of why Alfonso said that, it was still rude.

We can also apply Jespersen's (echo) questioning test sketched in §2.1.3 (p. 61), to further verify that these are interrogative clauses. If they are interrogative clauses, we should echo question them with "what"; if they were free relatives we would echo question them with a matched "wh"-word. We find "what" only.

(278) A: Regardless of who Alfonso was talking to, he was still rude.
B: He was still rude regardless of WHAT??

B': * He was still rude regardless of WHO??

(279) A: No matter who Alfonso was talking to, he was still rude.

B: He was still rude no matter WHAT??

B': * He was still rude no matter WHO??

Several more of the tests from the previous section for determining whether we have an interrogative structure could be applied. However, the issue is much more straightforward for the content clauses of headed unconditionals, and so I will not go through the tests in detail here. The results are completely conclusive on the side of an interrogative structure in every way.

Both constructions also take "concealed question" DPs in the content position. ("No matter" is in general slightly marked with these; I have used attested examples here to counter for that. I don't know why there is this asymmetry. Also, for whatever reason, "no matter" with concealed questions is very common in headlinese.)

(280) a. Regardless of the answer, Alfonso should go to the party.

b. Regardless of the capital of Italy, Alfonso should pass the test.

(281) a. No matter the race results, Democratic veterans seem ready to rally around the survivor. (Google)

b. Your boss must stand up for you no matter the problem. (Google)

This data suggests that the selection is semantic selection of a question meaning, rather than syntactic selection of an interrogative clause.

It is also worth mentioning that "no matter" can take a "that"-clause, just like its verbal correspondent. Unlike the verbal case, this seems to involve an entirely different construction with completely idiomatic syntax. "No matter that ..." is not an adjunct and never modifies a sentence, and instead appears as a fixed sentential construction with its own force. It is characteristically used to list things that don't matter but perhaps should – in discourse structure terms, it provides explanation for unconditional or concessive claims. These claims can be explicit in the preceding discourse, or implicit. The following are attested examples found via google:

(282) We stand solidly behind our troops – no matter what. No matter that there were no weapons of mass destruction in Iraq. No matter that there was no connection between Iraq and Al Qaeda. (*it goes on like this for some time...*)

(283) And the facile optimism in news accounts of the north/south peace agreement to be signed on January 9, 2004 in Nairobi can typically manage to include Darfur only as an afterthought. No matter that the final security arrangements agreed to in the Naivasha (Kenya) peace agreement allow Khartoum an ominously long two and a half years to keep its massive military presence in Southern Sudan.

(284) Those same political eyebrows were arched recently over reports that Nancy Reagan had the temerity to inject her opinion into White House staffing considerations. No

matter that most of the country seemed to share her concerns; no matter that she formed her opinion after reaching out to a variety of people and after seeking a full range of viewpoints; no matter that the only item on her agenda was the health and well being of Ronald Reagan. (New York Times editorial)

I will assume that this construction involves a different lexical item "no matter" (contra Izvorski 2000b); the two constructions do seem related, but the fact that the list construction does not have a modifying function suggests that the relation is not synchronic. The verb "matter", which takes both interrogative and declarative clauses, seems to be the common source.

In summary, here are the two lexical entries that define the constructions. I assume that the "of" contributes no meaning, and therefore the denotation of an "of"-phrase will be the denotation of the sister of "of". (This assumption is common in e.g. the literature on "of"-possessives; see Poesio 1994; Barker 2005; Rawlins 2005)

(285) Lexical entry: regardless
Syntactic selection: PP["of"]
Semantic selection: question denotation

(286) Lexical entry: nomatter
Syntactic selection: –
Semantic selection: question denotation

This concludes the discussion of the internal structure of an unconditional adjunct. I have argued that both constituent and alternative unconditionals straightforwardly involve an interrogative clause. Headed unconditionals involve a head of some kind that selects for a question meaning, resulting in the clause containing any kind of interrogative clause, or even a concealed question.

2.2 External structure: Unconditionals as conditionals

The first half of this chapter explores the internal structure of an unconditional adjunct. Now I turn to the external structure – the relation of an unconditional adjunct to the sentence it appears in. My main claim, following much work on unconditionals, is that they are a species of conditional adjunct. This idea is shared in some form by nearly every piece of research on unconditionals (König 1986; Zaefferer 1990, 1991; Lin 1996; Haspelmath and König 1998; Izvorski 2000a,b; Gawron 2001; Huddleston and Pullum 2002; Cheng and Giannakidou to appear). However, the question of how closely unconditionals are related to "if"-conditionals, and what form the relationship takes, has not been definitively answered. I take the position that the two constructions, unconditionals and "if"-conditionals, have literally the same external syntax and semantics.

This claim is about the syntax/semantics interface. It follows from the claim that the two kinds of adjuncts should generally share a range of distributional properties. It also follows that whatever makes a conditional a conditional should be present in both kinds of structures, and for many analyses this property follows from a claim about the LFs of conditional sentences.

In the remainder of this chapter I present a range of arguments for this claim, and discuss the structural analysis of conditional adjuncts. In chapter 3 I turn to the semantic side of this claim, and develop an analysis according to which unconditionals and "if"-conditionals behave the same compositionally.

2.2.1 What it means to be a conditional

The question of whether an unconditional adjunct is the same kind of adjunct as an "if"-clause adjunct is non-trivial. The reason for the non-triviality is that it is difficult to answer without some theory of what it means to be a conditional, from a linguistic perspective. Unfortunately there is no settled theory of this. In fact, in the typological and descriptive literature, the conclusion so far has largely been that there can be no theory, or that it simply amounts to what can be paraphrased with "if" (I discuss this further below). On the other hand, there does seem to be a clear class of "conditional-like" adjuncts in English, and in other languages as well. Is there any way in which these adjuncts pattern together? I suggest below that the Lewis-Kratzer-Heim analysis of "if"-conditionals can serve as the basis for a more generalized theory of what it means to be a conditional. First, I review some discussion in the literature on this topic.

The background The first approach I will discuss to this question is a very simple one that is implicit in just about all semantic and philosophical work on conditionals. This is the idea that an English conditional is a sentence containing an adjoined "if"-clause. This is obviously not a useful definition if we are interested in conditional-like adjuncts, though it is of course highly useful as a way of narrowing the focus of some research. Despite its linguistic narrowness, it turns out that a definition of this kind is often used in some way even in more typologically oriented studies. I will refer to this theory (which is an obvious straw-man, without further elaboration) as the "if"-theory. It turns out that most proposals for a theory of what it means to be a conditional are, in fact, elaborations of the "if"-theory.

There is a very old tradition that analyzes conditionals as involving the semantics of classical material implication. There is a huge body of literature on this topic and I do not propose to review it here; see e.g. Bennett 2003 chapters 2-3 for an overview. I take it for granted that the material implication analysis of the semantics of conditionals is not a viable analysis at this point in time. However, it useful to consider this idea in light of Comrie 1986, which does try to provide a linguistic theory of what it means to be a conditional. According to Comrie, a conditional is a bi-clausal structure where the two clauses are related by material implication, in combination with some stronger relationship of causality. The role of material implication in this discussion is more a working assumption rather than a settled fact; the focus of the paper is on typological issues. Comrie also explicitly assumes that this is a "prototype" concept – there are no necessary and sufficient conditions, but rather that certain constructions are prototypical conditionals. In particular, English "if"-clauses are the prototype. This idea of what it means to be a conditional is semantic, not structural, and it has only weak predictive power. That is, because of the prototypical nature of the theory, it does not make any predictions about what

kind of conditionals there are, even in English, though it does suggest that anything that seems semantically like an "if"-clause will be a conditional – suggesting paraphrase as the most useful tool for determining what makes a conditional.

More recently, Declerck and Reed 2001 in an exhaustive empirical study of English conditionals, approach the question. They explicitly do not provide a real theory of what it means to be a conditional, as their study makes clear the real difficulty of this task. They give a working version of such a theory:

> "It is extremely difficult, if not impossible, to give a precise definition of 'conditional meaning' or 'conditional interpretation'. ...Faced with these problems, we have decided to adopt a very broad definition..., which corresponds to the way the term is intuitively used by most linguists: a conditional is a two-clause structure in which one of the clauses is introduced by *if* (possibly preceded by *even*, *only*, or *except*) or by a word or phrase that has a meaning similar to *if*, *only if* (e.g. *provided*), or *except if* (e.g. *unless*)." (Declerck and Reed 2001 pp.8-9)

Again, this is a more elaborated version of the "if"-theory. However, unlike Comrie's elaboration, it is quite explicit about the fact that even in English there are a range of "if"-clause-like adjuncts.

Another version of the "if"-theory comes from the introduction to the large-scale typological study in Xrakovskij 2005:

> "We proceed from the hypothesis that a definition of the universal *IF* concept is impossible in principle, because it represents a semantic primitive. In different languages this concept is expressed through a variety of means..." (Xrakovskij 2005 p. 93)

This is explicitly an "if"-theory in the Comrie style, where there are no necessary or sufficient conditions to be a conditional. However, the researchers involved in this study take a very strong position, suggesting that it is not even possible to answer the question of what it means to be a conditional.

The question is whether any of these theories are useful to us now. Do they predict unconditionals to be (or not to be) a kind of conditional? All three theories make a weak prediction that unconditionals are a kind of "if"-conditional. This is because, as has been noted by several researchers (König 1986; Lin 1996; Haspelmath and König 1998), unconditionals can be paraphrased as conjunctions of "if"-conditionals, and at their heart, all three theories rely on some notion of paraphrase or translation to an "if"-conditional.

(287) Whether Alfonso or Joanna brings the beer, it will be a good brand.

(288) If Alfonso brings the beer, it will be good, and if Joanna brings the beer, it will be good.

I describe the prediction as weak because none of the theories makes explicit allowance for paraphrase with *multiple* "if"-conditionals. However, it seems reasonable to allow for this. None of the theories provide us with obvious means to test further for the conditionality or non-conditionality of unconditionals.

There is another problem with this class of theories, that implicitly or explicitly rely on paraphrase, that has been pointed out in the previous literature (e.g. by Geis 1985; Lycan 2001). This is that there are constructions that can be paraphrased with an "if"-conditional (e.g. they should be described as involving an *IF*-concept or whatever), and do not look structurally anything like an actual "if"-conditional. These are paratactic conditionals:

(289) Keep moving and I'll shoot!

(Paraphrase: If you keep moving, I'll shoot.)

(290) Stop or I'll shoot!

(Paraphrase: If you don't stop, I'll shoot.)

A semantic theory of such structures would want to derive their conditional-like meaning. However, I do not think that a linguistic theory of what it means to be a conditional would want to include such structures in its inventory. For one thing, these sentences do not appear to involve anything like the adjunction structure seen in "if"-conditionals. (One piece of evidence, discussed by Lycan 2001, is that they do not freely permit backwards pronominalization.) The internal structure of the antecedent is also unlike that found in more familiar conditional sentences, in that it allows an imperative. Furthermore, the exact nature of the conditional paraphrase is determined by the choice of conjunction, not just by the content of the "antecedent" – if it is disjunction, we have to have a negated antecedent in the paraphrase. This suggests that even though there is a conditional-like paraphrase, there is no grammatical correspondence of the paratactic structure to such a paraphrase. Rather, the truth-conditions (and dynamics) of the structure come out similar to those of its conditional paraphrase.

In summary, existing theories of what it means to be a conditional have two problems for my purposes here. First, they rely too heavily on intuitions about paraphrases, where the paraphrases do not necessarily tell us anything about the linguistic structures involved. Second, beyond paraphrase tests, they don't provide enough tools for testing conditionality. (This is of course not to suggest that the theories I have sketched above are not highly useful in their original contexts.) Therefore, in order to answer the question of whether an unconditional and an "if"-conditional are the same species of adjunct, we need a new theory of what it means to be a member of that species.

The proposal I would like to suggest that what has been called the Lewis-Kratzer-Heim (LKH) theory of conditionals (Lewis 1975; Kratzer 1977, 1981, 1986, 1991; Heim 1982; Partee 1991; von Fintel 1994) provides the perspective we need. The theory, as it is commonly described, is that the function of an "if"-clause is to restrict the domain of some operator in the main clause. What I propose is a straightforward generalization of the LKH theory:

(291) **The generalized Lewis-Kratzer-Heim theory of conditional adjuncts**

A conditional adjunct is any adjunct which serves to restrict the domain of an operator.

This extension is nearly automatic from the standard interpretation of the LKH theory. The idea is in fact present in some parts of the literature on conditionals. Stump 1985 proposes that "if"-clauses and weak adjuncts (see below for some examples) form a class together, and have similar semantic properties in a Kratzer-style analysis of modal sentences. von Fintel 1994, working within an LKH theory, suggests that "if"-clauses are not the only way of restricting operator domains, and discusses other operations on operator domains such as exception (cf. "unless"). Gawron 2001 suggests that a generalization of the LKH theory might apply to unconditionals.

The extension is particularly attractive if we can find other adjuncts that operate like "if"-clauses in modal sentences. We do, and this is why the "if"-theory is so limiting. The prototypical example of an adjunct that restricts the domains of operators, already pointed out by Lewis 1975 (see also Farkas and Sugioka 1983; Hinterwimmer 2007), is the restrictive "when"-clause:

(292) When m and n are positive integers, the power m^n can always be computed by successive multiplication. (Lewis)

(293) John is grouchy when he is hungry. (Farkas and Sugioka)

In the first case, the adverb "always" is restricted by the content of the "when"-clause. The main clause would clearly not be true, for instance, if we were considering real values of n. In the second case, Farkas and Sugioka argue that a covert generic operator is restricted by the "when"-clause; we could see similar restriction with an adverb like "usually".

In fact, Lewis notes that "whenever"-clauses also function as a domain restrictor of sorts, suggesting that they bring with them their own built-in universal operator. (But, notice in Lewis' example, there is still a modal "can", whose domain is also restricted.)

(294) Whenever m and n are positive integers, the power m^n can be computed by successive multiplication. (Lewis)

This example in fact looks like a canonical unconditional structure, except with "when" in place of e.g. "who". The analysis I develop here applies directly to such examples.

On top of "when" and "whenever" clauses, there is a range of further conditional-like structures that do not involve "if". Here are some more examples:

(295) Had Alfonso talked to Joanna, he would have known about her brother.
(**Counterfactual inversion**)

(296) You're gonna kill yourself, you keep driving like that.
(**TP adjunct**; Haiman 1986 ex. 17a)

(297) **Infinitival purpose clauses** (von Fintel and Iatridou 2005 inter alia)
   a. To get to Harlem, you have to take the A-train.
   b. To get this job, you have to speak fluent Spanish.

(298) **Weak absolute adjuncts** (Stump 1985)

a. Standing on a chair, John can touch the ceiling.

b. As a blonde, Mary might look something like Jane.

The null hypothesis, I take it, is that if we are to have a theory of conditionals we should include these structures. They each involve an adjunct, and they each involve an operator in the main clause, as per the LKH theory. So, pre-theoretically, there appears to be a reasonably sized class of adjunct conditionals, involving a range of internal structures for the adjunct. The only immediately obvious unifying character to the above class is that the conditional antecedent is expressed with an adjunct, and that there is an operator in the consequent clause.

Paraphrase-oriented theories of what it means to be a conditional do group the above examples with "if"-clauses. However, they provide no deeper understanding of *why* the above adjuncts group together, or even why we should have a significant class of such adjuncts in English.

In between the extremes of "obvious" adjunct-conditionals, and paratactic structures, we have a range of other adjunct constructions. Unconditionals have been so often assumed to be a kind of conditional, that they would seem to fall closer to the obvious cases. There are other adjunct structures, and they are not obviously conditionals, though it is not inconceivable that they might be. These include some temporal adjuncts ("before, after, while"), adverbial exceptives ("unless"), causals ("because"), concessives ("although, despite"), and a range of others. It remains an open question to what extent any of these are conditional-like. Several of the theories I mentioned above classify exceptives with conditionals, and the LKH theory provides some justification for this. Von Fintel (1994) analyzes "unless"-type exceptives as interacting with the domain of an operator, but the particular operation involved is not restriction.

The generalized LKH theory does lead us to think that there might be some class of uniform behavior among a class of conditional adjuncts. What the uniform behavior is partly depends on the particular implementation of the regular LKH theory. For instance, the correlative analysis of "if"-clause adjuncts (Geis 1985; Iatridou 1991; von Fintel 1994; Bhatt and Pancheva 2006) might lead us to believe that all, or at least some conditional-like adjuncts are correlatives as well. (Note that here, the sense in which they would be correlatives is distinct from the sense discussed earlier in the chapter. The proposal is that they are correlatives involving relative structures whose denotations are in the domain of possible worlds, not individuals.) Any properties that follow from them being correlatives should be present in the entire class. (I turn to the correlative analysis at the end of the chapter; as we will see there it makes few if any predictions about unconditionals, though unconditionals make some predictions about it.) As a baseline, though, any implementation of the LKH theory does make certain predictions. We expect domain restriction (or interaction with an operator's domain). We expect similar scopal properties among conditional adjuncts. We expect quantificational variability effects – where the interpretation of an indefinite in the adjunct mimics the quantificational force of the operator involved in the conditional structure. We expect at least some level of morphological similarity across different kinds of conditional adjuncts, and expect that non-conditional adjuncts should pattern differently.

In the remainder of this section I test some of these predictions with respect to unconditionals. The evidence is strongly in favor of unconditionals being a kind of conditional, in the generalized LKH sense.

2.2.2 Interaction with an operator

The most significant prediction of the generalized LKH theory (following from Lewis 1975) is that a conditional adjunct will interact with the domain of some operator. Gawron 2001 suggests this argument, and uses it to motivate a truth-conditional parallel between unconditionals and "if"-conditionals. The intuition is easiest to see with a modal. A modal like "should" is not absolute, and is sensitive to a contextually determined domain. Suppose we are talking about your plans for the evening, and I say:

(299) You *should* come to the party.
Paraphrase: In all (contextually salient) situations compatible with my desires, you come to the party.

Here, "should" is a "bouletic" modal, i.e. it expresses the desires of the speaker. This modal is sensitive to all sorts of circumstances we might have been discussing, and does not indicate a sort of absolute desire that you come to the party in any circumstances. For instance, perhaps we have been discussing the possibility that your other plans might fall through. If I utter (299), the situations that are contextually salient are ones where you do not go through with your other plans. The sentence does not indicate, in this scenario, that you should come even if they don't fall through.

This kind of restriction can be made explicit with an "if"-clause:

(300) If Alfonso comes to the party, you *should* come.
Paraphrase: in all (contextually salient) situations compatible with my desires where Alfonso comes to the party, you do too.

Here, the desires expressed are relativized to situations where Alfonso comes to the party. The sentence does not express any desires about the cases where he doesn't.[40]

Unconditionals can also target the same operators, though in what appears to be a different way:

(301) Whether or not Alfonso comes to the party, you *should* come.
Paraphrase: in all (contextually salient) situations compatible with my desires where Alfonso either does or doesn't come to the party, you do too.

[40] Some sentences of this kind have been claimed to be subject to inferences such as "conditional perfection" (Geis and Zwicky (1971); Horn (2000a); von Fintel (2001a) among others) which would be about cases where the antecedent is false. In particular, Geis and Zwicky claim that "if"-conditionals are strengthened ("perfected") into biconditional meanings – we infer an "only if" component to the meaning. There are many examples where conditional perfection does not arise (von Fintel 2001a inter alia), and the examples I use here are of this kind. I also take it here that conditional perfection is not part of the semantics of a conditional, following both Horn and von Fintel.

(302) Whoever comes to the party, you *should* come.

Paraphrase: for any combination of people x who could come to the party, in all (contextually salient) situations compatible with my desires where x, you do too.

In these kinds of examples, the adjunct does not indicate that we should focus in on some particular circumstances. Rather, it tells us that the domain of the operator cannot be restricted in a particular way. In (301), for interpreting the modal claim, we must consider both circumstances where Alfonso comes to the party, and ones where he doesn't. In (302), we have to consider circumstances where anyone who could come does come to the party. In a sense, the unconditional adjunct prevents us from narrowing the domain of the operator in a certain way. This interaction, as with "if"-conditionals, appears to be *obligatory*: there is no way of interpreting these unconditional sentences so that the domain interaction does not happen.

At first glance, it might appear that this constitutes a difference, not a similarity, between the two constructions. What is happening to the operator's domain in unconditionals does not seem to be restriction per se, but rather expansion. However, in the following chapter, I show that it is a case of domain restriction. The difference is that there is not one domain restriction, but an exhaustive sequence of domain restrictions, one for each alternative introduced in the antecedent. So at this point, I ask that the reader suspend judgement on this issue. In any case, we have already seen one other potential kind of non-"if" conditional that interacts with operator domains but does not restrict; these are "unless"-type exceptives. The point here on which they are similar is that they both involve an obligatory interaction with the domain of some operator.

We can probe the interaction a little bit more by examining the combination of multiple conditional adjuncts. If the interaction with an operator is obligatory, and there is only one operator, distinct conditional adjuncts should target the domain of the same operator. This is predicted even for different sorts of conditional-like adjuncts. First, here are some examples that illustrate *interference* between conditional adjuncts. For the sake of variety, and since they are also known to interact with operator domains (von Fintel 1994), I have also given an exceptive example with "unless".

(303) # Whether or not Alfonso comes to the party, if Alfonso comes to the party, you *should* come.

(304) # Whoever comes to the party, if Alfonso comes, you *should* come.

(305) # Unless Alfonso comes to the party, whoever comes to the party, you *should* come.

All of these examples are odd. This is because the unconditional adjunct tries to "undo" in some way what the other adjunct does to the domain of the main-clause modal. In principle, all of these combinations might be possible, on a non-LKH analysis of unconditionals. In particular, for the last two, there is no obvious *a priori* reason why we should not get the following meanings:

(306) Whoever else comes to the party, if Alfonso comes, you *should* come.

(307) Unless Alfonso comes to the party, whoever else comes to the party, you *should* come.

The fact that we don't strongly suggests that unconditionals, "if"-conditionals, and exceptives all interact in the same way with the same domain of some operator.

Similar to the interference examples, we can get *stacking* of domain restrictions. In the following examples, the domain restrictions, unrestrictions, and exceptions are all compatible with each other, and so the combinations are felicitous:

(308) Whether or not Alfonso comes to the party, if the party is at Joanna's house, you *should* come.

(309) Whoever comes to the party, if the party is at Joanna's house, you *should* come.

(310) Whoever comes to the party, unless the party is at Joanna's house, you *should* come.

In each case, the domain interactions all target the same main-clause operator, "should". Once again, this strongly suggests that all three kinds of adjuncts form a class, at some level of the grammar.

For someone who doesn't believe in the generalized LKH theory, this argument still has force. That is, Lewis's 1975 point about the domain restriction of operators can be viewed as an entirely empirical point about truth-conditions, independent of any analysis. Lewis and followers have suggested an analysis that puts the empirical point at its center, and I follow Lewis as well in this. But even if this is wrong, the data still shows that "if"-conditionals and unconditionals serve a very similar function, and an analysis that works in a different way would still have to take this into account.

Conditional adjuncts are commonly taken to interact with a range of operators; the main case besides that of modals is adverbs of quantification. Here are two examples involving universal quantification:

(311) Whatever Alfonso eats, he always covers it in pepper.

(312) Whether or not Alfonso put pepper on his food, he always added salt.

In each case, there is a sense that the domain of cases covered by "always" are expanded to include the possibilities mentioned in the antecedent. Unlike an "if"-clause, unconditionals lend themselves better to universal force. The following examples with "usually" and "sometimes", while not completely ungrammatical/infelicitous, are marked or odd.

(313) Whatever Alfonso eats, he usually covers it in pepper.

(314) Whether or not Alfonso put pepper on his food, he usually added salt.

(315) Whatever Alfonso eats, he sometimes covers it in pepper.

(316) Whether or not Alfonso put pepper on his food, he sometimes added salt.

It is not very clear what the examples involving "sometimes" actually mean. In (315) for example, we must be considering every single thing that Alfonso eats, but we are only looking at

some eating situations. This odd tension between the unconditional and non-universal quantifiers seems to follow from the fact that non-universal quantifiers try to "undo" the inclusion of every single case by the unconditional adjunct. There is a scale of felicity depending on how close the quantifier is to being universal. Examples down to "usually" are basically fine, and below that they get odder:

(317) a. Whatever Alfonso eats, he always covers it in pepper.
b. Whatever Alfonso eats, he almost always covers it in pepper.
c. Whatever Alfonso eats, he usually covers it in pepper.
d. Whatever Alfonso eats, he typically covers it in pepper.
e. ? Whatever Alfonso eats, he often covers it in pepper.
f. ?? Whatever Alfonso eats, he sometimes covers it in pepper.
g. ?? Whatever Alfonso eats, he occasionally covers it in pepper.
h. ?? Whatever Alfonso eats, he once in a while puts pepper on it.

The degree of gradience in these examples is somewhat unexpected; it seems like the default expectation would be for e.g. unconditionals to either be compatible with everything, or be compatible with just universals. In fact, in this way unconditionals seem to pattern with "generalization" type "if"-conditionals:

(318) a. If the light is on, Alfonso is always at home.
b. If the light is on, Alfonso is almost always at home.
c. If the light is on, Alfonso is usually at home.
d. If the light is on, Alfonso is typically at home.
e. ? If the light is on, Alfonso is often at home.
f. ?? If the light is on, Alfonso is sometimes at home.
g. ?? If the light is on, Alfonso is occasionally at home.
h. ?? If the light is on, Alfonso is once in a while at home.

Whatever explains this pattern for generalization-type conditionals should also lead to an explanation for unconditionals. One possibility is that generalization-type conditionals involve a covert generic operator (Lewis 1975; Farkas and Sugioka 1983), and this operator is only compatible with universal-type QAdvs. Not all unconditionals would involve a generic operator per se, but they might all involve a covert universal operator that imposes a similar requirement. This idea follows Lewis's 1975 suggestion for "whenever" adjuncts, mentioned above. (Cf. the use of the Hamblin ∀ operator in ch. 3.)

In summary, there is strong evidence that unconditionals manipulate operator domains in a way parallel to "if"-conditionals and exceptives. This suggests that they are a kind of conditional, on the generalized LKH theory of conditionality.

Scope, binding, and quantificational variability "If"-conditionals are well known to give rise to certain puzzles about quantification and binding. Scope-taking DPs cannot scope out of "if"-clauses. In terms of binding, indefinite DPs can "scope" high enough to bind pronouns in the consequent; universally quantified DPs cannot do so. This is the problem of donkey pronouns (Geach 1962; Lewis 1975; Evans 1977, 1980; Parsons 1978; Cooper 1979; Kamp 1981; Heim 1982; Kadmon 1987; Heim 1990; Neale 1990; Elbourne 2001, 2005; Brasoveanu 2007 and many others). A correlated puzzle is that of quantificational variability; indefinites in the antecedent of a conditional can mimic the quantificational force of the operator that the conditional is restricting. There is a sense in which these puzzles arises from the tripartite quantificational structure involved in a conditional sentence. Therefore, the scope-limiting property, the donkey-licensing property, and the presence of quantification variability effects (QVEs) are plausible diagnostics for a conditional structure, and diagnostics tied to the generalized LKH theory.

It is not possible to scope quantifiers out of an unconditional antecedent. The following examples illustrate:

(319) * Whether or not every$_i$ professor talked to Alfonso, he$_i$ recommended Alfonso for the position.

(320) * Whether or not every$_i$ bishop talked to Joanna, he$_i$ wrote her up in his$_i$ weekly newsletter.

In each case there is a pronoun in the consequent that should be bindable if the universal quantifier takes scope outside the antecedent. In the first example, the reading should be: "for every professor, whether or not that professor talked to Alfonso, that professor recommended Alfonso." The second example, similarly, would involve "every bishop" binding "he". The example in (321) illustrates with a constituent unconditional; this example contrasts with the case in (322) where "they" is a plural pronoun anteceded by the domain of the quantifier, rather than bound by the quantifier.

(321) * Whatever Joanna said to every$_i$ bishop, she impressed him$_i$.

(322) Whatever Joanna said to [every bishop]$_i$, she impressed them$_i$.

With the plural pronoun, there is no covariation over bishops, and Joanna must have spoken to all the bishops at once. With the singular pronoun, the reading would have to involve covariation over the bishops, but this is simply not possible.

Like "if"-conditionals, unconditionals give rise to the "donkey-binding" problem. That is, indefinites that scope within the antecedent antecede pronouns in the consequent.

(323) If a farmer buys **a donkey**, he is nice to **it**.

(324) Whether or not Alfonso buys **a donkey**, he is nice to **it** in the store.

(325) Whoever owns **a donkey**, they feed **it** carrots.

(326) No matter who owns **a donkey**, they feed **it** carrots.

We also find quantificational variability effects in unconditionals. In "if"-clauses, indefinites can get quasi-universal force if the conditional is restricting a universal operator. For example, the sentence in (327) is a statement about many farmers and donkeys, despite the apparent existential force of the DPs in the antecedent.

(327) If a farmer buys a donkey, he always builds a paddock for it.

Unconditionals show a similar effect – we find quasi-universal interpretations for indefinites in the antecedent. The sentence in (328) is a statement about all presents that Alfonso gives.

(328) Whoever Alfonso gives a present to, they (always) like it.

A closely related fact is that, just as we find "single-case" conditionals as in (329), we find single-case unconditionals.

(329) If someone has a dime, they should put it in the meter.

(330) Whoever has a dime, they should put it in the meter.

The point about these examples is that they do not involve someone putting all their dimes in the meter – just one dime, even if someone with dimes has more than one. So while the sentences are quantifying over people-dime cases, they quantify only existentially over the dime-parts of each case.

Unconditionals and "if"-conditionals pattern the same with respect to antecedent scope limitations, donkey-binding, and quantificational variability. All of these patterns are predicted by the generalized LKH theory, if unconditionals are treated as conditionals.

2.2.3 Morphological parallels

Haspelmath and König 1998 and Gawron 2001 both argue that "if"-conditionals and unconditionals are related on grounds of similar behavior of verbal morphology in both the conditional and antecedent. This evidence is quite compelling, as far as it goes.

We get counterfactual morphology in unconditionals. That is, the present perfect marker "had" appears in the antecedent with a counterfactual meaning, in combination with "would" in the main clause. (Interestingly, it is not so easy to begin a counterfactual discourse segment with an unconditional; I provide an analysis of this in chapter 3.)

(331) (Suppose Alfonso didn't end up going to Bard, and Harvard or Princeton was his other choice.)
Whether he had gone to Harvard or to Princeton, he would have become a banker.

(332) Whatever John had chosen, Mary would have been pleased with it. (Gawron)

Another morphological pattern that we find in unconditionals as well as "if"-conditionals is what is sometimes called a dependent present tense.[41] This is where a present tense appears

[41] Gawron refers to this in his discussion of unconditionals as futurate present.

in the antecedent in combination with a future modal in the main clause, and the present tense gets a future meaning. This pattern has been discussed as a test for conditionals by Haegeman 2003 (Haegeman uses it to distinguish biscuit conditionals from normal conditionals). See Bennett 2003; Haegeman 2003 among others, as well as Schulz 2008 for a recent analysis.

(333) Whether Alfonso is tired or not, he will have a good time at the party.

(334) Whatever Alfonso is wearing, Joanna will make fun of it.

In each of these examples the present tense in the unconditional adjunct has a future interpretation.[42]

The general point of this data is that the tense/aspect morphology is behaving in unconditional sentences as it does in "if"-conditional sentences. To the extent these tense/aspect patterns are specific to conditionals, this suggests that unconditionals are conditionals.

Before moving on, however, I have to introduce a new obsevation that reins in this evidence a bit. There is another morphological pattern found in "if"-clauses, that is not found in unconditionals. This is the use of the past subjunctive "were" auxiliary. (There is a certain amount of speaker variation on these facts.)

(335) If Alfonso were a linguist, he would be a semanticist.

(336) ?? Whether Alfonso were a linguist or a philosopher, he would study semantics.

(337) * Whatever profession Alfonso were to have, he would be interested in language.

In unconditionals, the use of the simple past "was" to get the subjunctive meaning is required. This is also possible with "if"-clauses, somewhat more colloquially ("was" has to be phonologically reduced, and sometimes examples like these are better with supporting context).

(338) If Alfonso was a linguist, he would be a semanticist.

(339) Whether Alfonso was a linguist or a philosopher, he would study semantics.

(340) * Whatever Alfonso's profession was, he would be interested in language.

We do find the somewhat archaic subjunctive "be" in unconditionals of the kind I have been discussing, and a new, also somewhat archaic, unconditional-like construction:

(341) Whether he be a philosopher or linguist, he will be interested in knowledge attributions.

(342) Be he a philosopher or linguist, he will be interested in knowledge attributions.

Subjunctive "be", as far as I can tell, does not appear in "if"-clauses.

(343) * If he be a linguist, he'll be able to explain raising and control.

[42] Note that a present tense in an unconditional antecedent does not *always* have a future reading; this is true of "if"-conditionals as well.

It's not clear that the distribution of the subjunctive tells us anything, overall. We expect cross-linguistically to find subjunctives in both conditional constructions and unconditionals, and we certainly do in English. But some subjunctive forms do not appear in unconditionals, and some do not appear in "if"-conditionals. This is confounded by the slightly archaic nature of subjunctive "be". What is clear is that we must assume a theory of conditionality that allows for some flexibility in the licensing of subjunctive morphology. (Subjunctive "were" is licensed in some other, but not all, non-canonical conditional adjuncts.)

So, the morphological patterns of "if"-conditionals and unconditionals are not exactly matched. It is also worth noting here that counterfactual morphology can appear in a surprisingly large range of adjuncts. Also, some adjuncts that many authors have classified as conditional-like, e.g. "unless"-exceptives, do not work easily with counterfactual morphology; see Geis 1973; von Fintel 1994 for discussion (and Declerck and Reed 2001 §13.3.2 for some examples that *are* good). Tense/aspect patterns of the kinds described here are therefore not going to be fully reliable guides to conditionality, until we understand the reasons behind the patterns. However, the morphological facts about unconditionals discussed in this section are still highly suggestive of a conditional analysis of unconditionals.

2.2.4 Biscuit unconditionals

Biscuit conditionals (sometimes called relevance or speech act conditionals) are examples of "if"-conditionals where the antecedent is somehow more detached from the consequent. They typically entail their consequent (Austin 1956a, Iatridou 1991, Haegeman 2003 etc., Siegel 2006, and much other work). A typical example is given in (344).

(344) If you're hungry, there's a sandwich in the fridge.

We find relevance unconditionals as well:

(345) Whether you're hungry or not, there's a sandwich in the fridge.

(346) Whatever you're hungry for, there's probably some in the kitchen.

Since unconditionals already entail their consequent, it is not necessarily so obvious that these are relevance unconditionals. However, I think the intuitive point is quite clear. The unconditional adjuncts here do not have a paraphrase as a series of (restrictive) "if"-conditionals, and seem more detached from the main clause. In (346), for instance, the contents of the kitchen do not have any correlation with what the hearer is hungry for. This example might be paraphrased as "if you're hungry for cake, there's probably some in the fridge, and if you're hungry for crackers, there's probably some in the fridge, etc." Each of these is a regular biscuit conditional.

The fact that unconditionals and "if"-conditionals both alternative between relevance and non-relevance readings suggests a close parallel between "if"-conditionals and unconditionals.

2.2.5 Distributions of (un)conditional adjuncts

The distribution of unconditional adjuncts matches the distribution of "if"-adjuncts. As a first approximation, we find both of them sentence initially and sentence finally:

(347) a. If Alfonso didn't go to the store, I will buy some milk later.
b. I will buy some milk later if Alfonso didn't go to the store.

(348) a. Whether or not Alfonso went to the store, I will buy some milk later.
b. I will buy some milk later whether or not Alfonso went to the store.

(349) a. Whatever Alfonso gets at the store, I will buy some milk later.
b. I will buy some milk later whatever Alfonso gets at the store.

This is of course true of nearly the full range of CP adjuncts, so it doesn't uniquely identify any subclass of them.

We also find unconditionals sentence-medially. Paralleling "if"-adjuncts, we find alternative unconditionals in reduced form – the verb in past participle form, with no overt arguments. This is possible with constituent and headed unconditionals as well, but it seems that it is necessary for the "wh"-phrase to be an adjunct. Given that the "if" version appears to necessarily involve a subject PRO, it is not surprising that it will be difficult to form a constituent interrogative clause with an argument position gap in a similar way.

(350) a. Alfonso, if he is elected, will continue advocating change.
b. Alfonso, if elected, will continue advocating change.

(351) a. Alfonso, whether he is elected or not, will continue advocating change.
b. Alfonso, whether elected or not, will continue advocating change.

(352) a. Alfonso, whoever elects him, will continue advocating change.
b. Alfonso, however elected, will continue advocating change.

(353) a. Alfonso, no matter who elects him, will continue advocating change.
b. Alfonso, no matter how elected, will continue advocating change.

2.2.6 Summary

In this section I have described several ways in which unconditionals and "if"-conditionals pattern together. The evidence seems quite strongly in favor of the two being the same species of adjunct.

One caveat must be made here: many of the tests pick out a much larger range of adjuncts than might be otherwise expected. I will leave full exploration of this for future work, but the general conclusion is that the class of conditionals might be larger than expected from a paraphrase-based theory. That is, once tests such as the ones presented in this chapter are accepted as diagnostics for conditional adjuncts, we may be forced to admit that to the extent there is a linguistically well-defined class of such adjuncts, it is much larger than previously thought.

2.3 The structure of a conditional sentence

It does no good to know that an unconditional is a kind of conditional without knowing how conditionals are structured, and how their structure fits together. Accordingly, in this section I discuss both the broad family of analysis I follow, and the particular version of that analysis I will assume in the following chapters.

I will be working within the category of analyses picked out by the Lewis-Kratzer-Heim theory of conditionals. In the broadest sense, all that is required to fit into this category is to have a conditional adjunct restrict the domain of an operator. The theory does not even require that there be a consistent way of doing this. But to give an analysis, we need to settle on some implementation. We must also consider whether unconditionals make any predictions about our choice of implementations.

There are roughly three theories about where conditional structures sit at the interface between syntax and semantics: what I will call the shifting theory, the binding theory, and the movement theory. The general theoretical question that differentiates these theories is how information is compositionally "transmitted" from the adjunct to the operator; the names I have given them are suggestive of the answers. (Each of these theories can be implemented in many ways, and I will discuss them in very broad terms here.)

2.3.1 Conditional adjuncts as context shifters

The shifting theory is that modals receive their domain restriction via the context of interpretation, and that a conditional adjunct shifts the context. I take this to be a traditional implementation of Kratzer's theory (Kratzer 1981, 1986). That is, the conditional adjunct provides some temporary assumptions to the context, and the modal is evaluated with respect to these assumptions. This is also the theory of conditionals suggested by analyses in dynamic semantics, where a conditional update is decomposed into several steps, the first of which is introducing the content of the conditional as a temporary assumption to the context set. This idea has a long history in dynamic treatments of conditionals (Karttunen 1974; Heim 1982, 1983, 1992; Groenendijk et al. 1996; von Fintel 2001b; Gillies 2007); see Isaacs and Rawlins 2008 for explicit discussion of the decomposition. The shifting approach really has its roots in the first half of Ramsey's 1931 famous footnote:

> "If two people are arguing 'If p, will q?' and are both in doubt as to p, they are adding p hypothetically to their stock of knowledge and arguing on that basis about q..."
> (Ramsey 1931; p. 247)

The step that an "if"-clause takes, on a shifting account, is to have us add p to our stock of beliefs.

The kind of interpretive procedure involved is summarized in (354):

(354) **Shifty interpretation of an "if"-conditional**

For a conditional of the form "if p, (then) Op q":

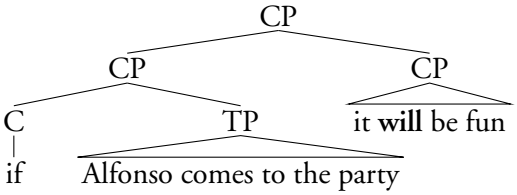
Step 1: Add p temporarily to the information store
Step 2: Interpret Op q using the temporarily revised stock of beliefs
Step 3: Import what we learn to our non-temporary information store

For formal details of how this procedure might work, see chapter 3, as well as the dynamic accounts cited above.

On the shifting theory, conditional adjuncts are syntactically adjuncts like any other clausal adjunct. That is, for this theory, there are no significant assumptions we must make about the LF of a conditional sentence. (This is a substantial difference from the other two implementations discussed below.) We of course must assume that there is something that actually *does* the shifting – combines with the content of the conditional adjunct and turns it into a context shifter. One candidate for this would of course be "if". This is the impression one would have from the dynamic theories, which typically define the context-change potential of an "if"-clause syncategorematically on "if". However, if there are any kinds of conditionals besides "if"-clauses, as I have argued that there are, "if" can't be the only marker of shiftiness (to borrow a term from Gillies 2007). In the following chapter I use an operator COND that is distinct from the clause it takes as its argument; in chapter 4 I motivate this in terms of a feature that governs the appearance of argument-position clauses in adjunct position.

In (355) I have given an example of the (fairly uninteresting) LF structure of a clause-initial "if"-clause.

(355) **LF Structure of a conditional on a shifting theory**



This kind of account leaves most of the work of implementing the LKH-theory to the semantics.

Tangent: height of attachment In the tree above I have adjoined the "if"-clause to the CP. That this is a possibility can be shown on the basis of conditional interrogatives (Iatridou 1991; Bhatt and Pancheva 2006; Isaacs and Rawlins 2008). The fact is that "if"-clauses can adjoin higher than SpecCP, and (at least when overt material is present) cannot adjoin lower:[43]

(356) If Alfonso comes to the party, who will talk to him?

(357) * Who if Alfonso comes to the party will talk to him?

(358) * Who will if Alfonso comes to the party talk to him?

[43] (357) is acceptable as a parenthetical.

In embedded positions the situation is somewhat more complicated. An "if"-clause can always appear right-adjoined in such cases, unsurprisingly. It can also appear below "that", but not "for". It is not generally good above the complementizer in any of these structures.

(359) a. Alfonso believes that Joanna will talk to him if he goes to the party.
b. Alfonso believes that if he goes to the party, Joanna will talk to him.
c. * Alfonso believes if he goes to the party that Joanna will talk to him.

(360) a. Alfonso wants for Joanna to talk to him if he goes to the party.
b. * Alfonso wants if he goes to the party for Joanna to talk to him.
c. * Alfonso wants for if he goes to the party Joanna to talk to him.
d. * Alfonso wants for Joanna if he goes to the party to talk to him.

Embedded conditional interrogatives also strongly prefer right-attachment, patterning with "for"-clauses. A potential generalization about these cases is that (i) clausal adjuncts cannot attach high in an embedded clause, and (ii) they can attach below structure in a clause just in case that structure is not meaningful or is a modifier. (This second point will follow from the account of the distribution of conditional adjuncts I give in chapter 4.) This proposal assumes that "for" is meaningful in a way that "that" is not, in particular that it might take the subject as an argument. While I will not develop this idea further here, I will assume that the "if"-clause adjoins to the highest node possible in any given tree, be it a CP or an IP.

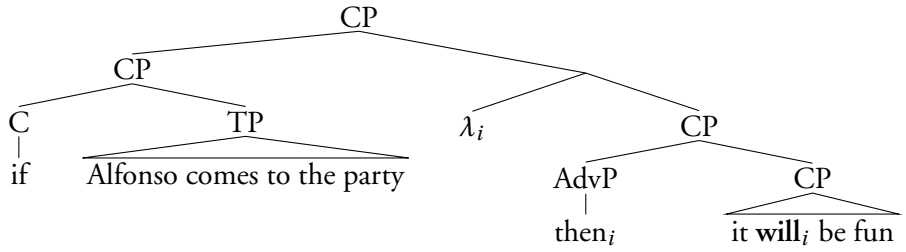
2.3.2 Conditional adjuncts as variable binders

The binding theory involves the conditional adjunct binding a world variable that provides a domain restriction to the modal (von Fintel 1994; Schlenker 2004; Bhatt and Pancheva 2006). The binding theory corresponds to a syntactic structure like that involved in a correlative construction (Geis 1985; Iatridou 1991; von Fintel 1994; Bhatt and Pancheva 2006). Recall from earlier in the chapter that a correlative construction (in the general case) consists of a relative-like clause adjoined to another clause, and binding a proform within that clause. The proform in this case would be the adverb "then". The correlative analysis therefore explains the tight intuitive link between "if"-clauses and "then". The difference from standard correlative constructions is that instead of binding a variable of type e, a conditional correlative would bind a variable of type s. That is, the structure involves relativization over worlds, not individuals. Semantically, this variable restricts the interpretation of the operator that the conditional adjunct interacts with.

While a semantic binding theory does not strictly require us to assume that conditional adjuncts are correlative adjuncts, in order to make the theory work we must make certain assumptions about LFs regardless. These assumptions are effectively the same either way, and should ideally be motivated. The correlative analysis is the only such motivation I know of, and so I will equate the two here. Nevertheless, it should perhaps be kept in mind that this equation is not entirely fair to the binding theory.

The binding theory is very much an interface theory. That is, it requires the binding relationship to be established at LF, e.g. by a lambda operator in the style of Heim and Kratzer 1998. This is illustrated by the tree in (361). I assume that "then" adjoins to CP for reasons similar to the high adjunction for "if"-clauses – in a conditional interrogative they cannot appear below C or SpecCP.

(361) **LF Structure of a conditional on a binding theory**



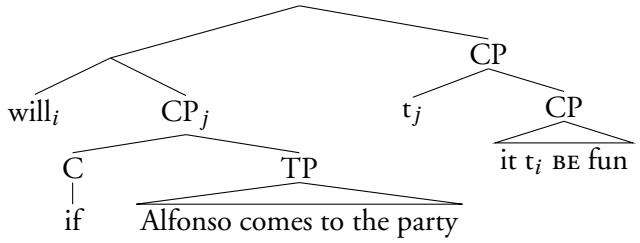
Note that I have left "will" in its in-situ position, and given it an index matching that of the correlative proform. It is not clear that this is right; one alternative is to scope it out of the clause at LF for type reasons. If this is done, it would potentially move into a position close to that of "then", and the two could interact directly, rather than via another binding step. That is, as it stands on (my interpretation of) Bhatt and Pancheva's analysis, the proform is not actually used to supply the domain restriction to the main-clause operator, but this appears to be a technical possibity.

When there is no "then", Bhatt and Pancheva suggests that the "if"-clause acts as an ordinary free relative. They point out that a theory involving a covert "then" would lead to incorrect predictions. In particular, the overt presence of "then" blocks certain cases of extraction that are not blocked in its absence. It is worth noting that for purposes of the LKH theory, we must assume that even without an overt "then", the "if"-clause binds a domain variable. Otherwise, no domain restriction will happen. So either way, the adjunct would have to bind a variable at LF, and we would need very similar assumptions to make this happen.

2.3.3 Conditional adjuncts as LF arguments of the operator

The preceding two theories solve the transmission-over-a-distance problem by using independently motivated techniques of storing information during semantic composition. Movement theories solve the problem by moving the pieces into an LF configuration where there is no distance; they end up in some local structural relationship (Heim 1982, Diesing 1992, von Fintel 1994 §3.2). Typically, this involves building a Heim-style tripartite structure at LF. (That is, a structure involving an operator, a restrictor clause, and a nuclear scope clause.) There are of course a variety of ways to spell out the movements necessary. The basic LF structure will look something like the one in (362). I have left off node labels as it isn't clear what they should be.

(362) **LF Structure of a conditional on a movement theory**



This structure is highly convenient for compositional purposes, and allows us to assign a quantificational determiner type (substituting worlds for entities) to "will". The conditional adjunct simply provides its restriction directly to the operator it interacts with. In fact, it makes the structure look quite similar to the kind of quantificational structure encoded at the surface for determiner quantification. Note that there are other ways to arrange the LF that also make composition equivalently easy that do not have this property (e.g. Diesing 1992 use a ternary branching structure at LF; however, Diesing also transforms determiner structures into a tripartite LF structure).

My perception is that when this approach is used in more recent work, it is intended as a convenience as much as anything, in research where the syntax/semantics interface problem is not the focus (e.g. in Ippolito 2003). Thus my comments here are not aimed at work which assumes a movement theory for convenience reasons, and I am confident that most such analyses could be transformed into an analysis of one of the other two types.

One general point about both the correlative analysis and the LF-movement analysis that I have sketched here is that they try to reduce the properties of conditional structures to some kind of structure known in the domain of reference or quantification to individuals/entities. The shifting theory does not do this.

2.3.4 Evaluation of the three theories

All of these kinds of analysis are empirically adequate at a basic level. That is, they all allow explanations of the basic phenomena of conditionals, such as quantificational variability, donkey pronouns, counterfactual/subjunctive conditionals, and so on. In fact, they are all technically compatible with my analysis of unconditionals. I argue here for a shifting theory and adopt it in the remainder of the dissertation, but in Rawlins 2008b I use a binding theory to no immediate ill consequences.

However, several of the theories lead to problems, and unconditionals provide some guidance as well. First I discuss some general arguments for and against the three kinds of theories, and then turn to unconditionals.

The movement theory, while useful at times, is not a serious contender as an analysis of the syntactic/semantic structure of conditionals. §3.2 of von Fintel 1994 gives several reasons not to prefer such an analysis. The basic point made there is that a movement theory makes the relationship between an "if"-conditional and an operator it restricts too tight, akin to the relationship between a determiner and its restrictor. In other words, movement theories try too hard to

reify a tripartite structure. von Fintel gives several reasons for supposing that the relationship between "if"-clauses and the operators they restrict is less grammaticized (building on Partee 1995 as well as the introduction to that volume); here are three: (i) A(dverbial)-quantification is universal, but D(eterminer)-quantification is not (see von Fintel and Matthewson to appear for a recent overview), (ii) Restrictors clauses for adverbs and modals show greater positional freedom, cross-linguistically, than determiner restrictors, and (iii) D-quantifiers typically require an overt restrictor whereas A-quantifiers do not. If the movement theory were correct, we would expect the two kinds of restriction to pattern alike in these respects.

As a further problem, movement theories, regardless of the particular movements involved, do not deal gracefully with cases involving multiple conditional adjuncts:

(363) If Alfonso comes to the party, then Joanna will have a lot of fun if she relaxes.

In order to get the right interpretation, we would have to move both "if"-clauses into the restrictor of "will" and conjoin them. There is no evidence, as far as I know, for covert conjunction in such structures.

A movement theory also does not deal well with cases where the restricted operator cannot be plausibly scoped out of the clause at LF. This scoping is perfectly natural with modal auxiliaries and adverbs of quantification, but it is not at all natural with certain other cases involving modality that can be restricted, such as non-finite relative clauses (cf. Bhatt 2001), modals in relative clauses, and "too" and "enough" comparatives (cf. Meier 2003).

(364) If you want cookies, Alfonso is the person *to* talk to. (cf. Bhatt 2001)

(365) If you want cookies, Alfonso is the person you *should* talk to.

(366) If Alfonso is standing on a chair, he is *tall enough to* touch the ceiling. (cf. Meier 2003)

In each of these examples, there is some kind of embedded (covert) modality, and its domain has to be restricted by the "if"-clause. For example, in (364), the claim is that to get cookies, you should talk to Alfonso. Alfonso is not necessarily the person to talk to for other desires. Similarly, for (366), there is a statement of physical possibility that is relativized only to circumstances where Alfonso is standing on a chair. If he is not standing on a chair, it is probably not possible for him to touch the ceiling.

A similar problem occurs in conditional questions. According to Isaacs and Rawlins 2008, an "if"-clause restricts the domain of the question operator. But there are many examples where it also restricts the domain of a modal operator. This is easy to account for on a shifting or binding approach, but here there is no easy LF structure which would place both of the operators in the right position relative to the "if"-clause.

(367) If Alfonso talks to Joanna, what *will* she say to him? (cf. Isaacs and Rawlins 2008)

Finally, the kinds of movements necessary are not easy to justify syntactically, and the constraints on them are tricky to state. It is not simply a matter of some generalized version of

QR. We have to make sure that the operator and its restrictor end up adjacent at LF, and that the nuclear scope is adjacent to this. In the presence of multiple clausal adverbs, for instance, it is not clear how to state this targeted movement in anything but transformational terms.

Given all this evidence, my conclusion on movement theories is therefore in line with von Fintel's 1994 comment that "it is very probable though that tripartite structures are merely a convenient meta-level notation." (p. 77).

The binding theory has a number of things going for it; it is perhaps the currently ascendant theory of conditionals at the syntax/semantics interface. One reason for this, I think, is simply that it provides a clear category to fit the English "if"-conditional construction into.[44] The reduction of English "if"-clauses to a kind of correlative construction has a strong typological precedent in Germanic. It potentially explains the tight relationship between "if"-clauses and "then". Schlenker 2004 has argued that "if"-clauses show condition C effects when we try to have their binder be "then". This is predicted on a binding approach. (Note that it is also predicted under a shifting approach, given that "then" would have to be in the scope of the "if"-clause to pick up its meaning.)

The binding theory also, at least potentially, provides an explanation for the fact that a conditional adjunct *must* restrict some operator (cf. Kratzer 1986 for the proposal of a covert necessity modal in conditionals without an overt one). This explanation comes in the form of what I have termed the correlation requirement (see (226) earlier in the chapter). (But note that any such explanation will not follow from the way Bhatt and Pancheva 2006 deal with "if"-clauses; we would have to assume that the covert variable is the correlative proform, not the overt "then".)

However, the binding theory does have a number of problems, and the correlation requirement also provides the first of them. It is well-known that "then" is typically optional, and sometimes disallowed, in "if"-conditionals (Iatridou 1991, 1994; von Fintel 1994). Therefore, on Bhatt and Pancheva's 2006 account, conditionals must be a kind of correlative that do not obey the correlation requirement. This is quite different behavior than is seen with must correlative structures over individuals that I know of. (However, see Izvorski 1996, which builds a theory of correlative proforms that predicts these gaps based on a correlative treatment of conditionals. Clearly there is more work to be done here before we can definitively conclude that "then" is not a correlative proform.)

As Bhatt and Pancheva 2006 acknowledge, the correlative/binding theory does not predict the locality effects we see. That is, the "if"-clause binds an operator in the closest clause, not just some operator in its scope. Typically, correlatives show a rather different behavior, where binding of the proform can be over arbitrary distances.[45] Finally, a correlative analysis tends to predict a more restricted distribution for "if"-clauses than for non-correlative clausal adjuncts (e.g. "because"-clauses). For instance, Hindi correlative clauses only appear

[44] Another is a general tendency to try to assimilate all long-distance effects to either A'-movement or binding. We have seen above that A' movement is probably not viable.

[45] One technical way of remedying this would be via Percus's 2000 Generalization Y: "The situation pronoun that an adverbial quantifier selects for must be coindexed with the nearest λ above it." But this still leaves both an explanatory gap, and a question about whether this behavior still reflects the behavior of a true correlative.

left-adjoined (Dayal 1996). However we do not find this restricted distribution, and distributionally, full "if"-clauses act like a run-of-the-mill clausal adjunct (see §2.2.5).

One further complexity of the correlative theory pointed out by von Fintel 1994 is that what happens in a conditional structure is not exactly *binding* per se. Rather, the "if"-clause provides further restrictions on an already contextually specified variable. This is a difference from regular correlatives that would have to be explained.

The shifting theory predicts the locality effect. Since the context is shifted for the interpretation of the sister of the conditional adjunct, the closest operator in its scope will have to be interpreted relative to the shifted context. It might seem that the shifting analysis overpredicts in that it predicts lower operators to also be interpreted relative to the domain restriction, but in general, clause-embedding verbs will also shift the context themselves. A shifting analysis does not predict any tight relationship between "then" and "if"-clauses. However, I think it is still plausible to say on the shifting analysis, as advocates of the correlative/binding analysis do, that the "if"-"then" relationship is a relic of a once-productive correlativization strategy. The difference is that on a shifting account, one would claim that this relationship has evolved into something else.

The shifting account also predicts the run-of-the-mill distribution, because on this account, "if"-clauses really are just another sort of clausal adjunct. (See chapter 4 for further development of this point.) Finally, it makes completely unsurprising the fact that the kind of binding of a variable involved in a conditional structure would have to involve restriction – restriction of existing contextual domains is built into a shifting account.

The balance of evidence is mixed, but I take it to be tipped in favor of a shifting theory. The shifting theory explains more, and has fewer empirical and explanatory problems. Next I turn to the question of whether unconditionals can contribute anything new to this balance.

2.3.5 Unconditionals and the binding theory

If unconditionals are a kind of conditional, as I have argued, they have the potential to provide a new perspective on the debate. Is it plausible to say that they involve correlative structures over worlds? I think it is a technically plausible analysis, but not a very empirically satisfying one. There are two basic problems. The defining properties of correlative constructions are (i) an adjoined relative clause structure of some kind, and (ii) a binding relationship between the relative structure and some (required) proform in the main clause (see discussion in §2.1.3 p. 67, also Srivastav 1991a; Dayal 1996; Bhatt 2003). Effectively, unconditionals have neither of these properties in any obvious way. That is, we have no direct evidence whatsoever for either of these properties holding. What I mean by saying that a correlative analysis is technically plausible is that there are means to explain away the lack of these properties, and I discuss some of them below. However, in absence of actual evidence for unconditionals having either property, it is not satisfying or even explanatory to describe them as correlatives.

First, Let us consider the plausibility of analyzing unconditionals with a relative-like structure over possible worlds. It is plausible to describe "if"-clauses as relative-clause like for a number of reasons. On the diachronic side, the construction appears to be related to older and

productive correlativization strategies, as well as to a general Germanic correlative construction illustrated by German "wenn...denn" sentences (Geis 1985). Semantically, several recent analyses of "if"-clauses have treated them as definite descriptions over worlds (Schein 2001; Schlenker 2004), exactly the kind of meaning we'd expect on a free relative analysis.

However, English unconditionals do not obviously involve an adjoined relative structure. Internally, I have shown that alternative and constituent unconditionals involve a simple interrogative structure; there is no evidence for anything more. Headed unconditionals involve an interrogative structure selected for by some element; the category of such elements are not so easy to determine but they are not obviously the kind of things found heading relative structures. In fact, "regardless" unconditionals seem to involve a prepositional layer between the selecter and the content of the adjunct. There is no reason, as far as I know, to equate any of these structures with anything relative-like. Furthermore, many of the unconditional constructions discussed in Haspelmath and König 1998 appear even less relative-like, especially alternative unconditionals where the marking of unconditionality amounts to subjunctive or optative marking on the verb.[46]

On the semantic side, it is technically possible to extend a definite description analysis to unconditionals (as in Rawlins 2008b). However, the denotation you get doesn't act like a typical definite description.[47] It acts like an alternative set of sets of worlds, something unknown in the realm of definiteness, and common for interrogative structures.

Let us turn to the question of the proform. Whereas the "if"-"then" relationship looks like something that, at least at one time, was a productive correlative-proform relationship, an unconditional is not compatible with "then", under any circumstances. (This fact was noted for alternative unconditionals by von Fintel 1994; p. 98, and Iatridou 1994 for "whenever" unconditionals.)

(368) Whether Alfonso comes to the party or not, (#then) it will be fun.

(369) Whoever comes to the party, (#then) it will be fun.

(370) No matter who comes to the party, (#then) it will be fun.

(371) Whenever Alfonso gets to the party, (#then) it will be fun.

In this respect, unconditionals work like "unless" exceptives, "only if" conditionals, and "even if" conditionals. There are, of course, explanations in the literature as to why such adjuncts are not compatible with "then". von Fintel 1994 observes that the structures that aren't compatible with "then" involve some kind of exhaustivity in the antecedent. Iatridou 1994 observes that such structures involve some kind of quantification over cases. Izvorski 1996, operating on the assumption that "then" is a correlative proform, gives a unified account if the behavior of a range of correlative proforms in other languages that pattern similarly to "then".

[46] Of course, as Haspelmath and König point out, many cases that their survey identified as constituent unconditionals *do* look like free relatives; but these are all regular free relatives over individuals.

[47] It does share certain parallels with a "free choice" definite description, such as the way Giannakidou and Cheng 2006 treat "-ever" FRs, except over possible worlds.

It appears that "then" isn't alone, in not appearing with such structures, and unconditionals aren't alone in not licensing such proforms.

However, consider what is involved in extending these explanations to unconditionals, something that I grant is technically possible. We have supposed that there is a kind of correlative structure that, definitionally, does *not* allow a proform. If there were independent evidence that unconditionals involved a correlative structure, than it might be reasonable to grant this. However, as I have suggested above, there is none. In the case of "if"-conditional structures, it is possible to take the treatment of "if"-"then" sentences as correlative structures to provide support for the idea that an "if"-clause is something like a free relative or definite description over possible worlds (Schlenker 2004), even when "then" is not present. (This is Bhatt and Pancheva's position.) But the complete lack of a proform in unconditionals leaves us without any evidence for a parallel position in the case of proforms. Thus we have no direct evidence for a correlative or even a free relative treatment.

Finally, I will briefly consider the possibility that unconditionals involve a different proform. In fact, Bhatt and Pancheva 2006 suggest that "still" and "nevertheless" are proforms correlated with concessive structures; to this number we might add "anyway(s)". (The idea is due in a general way to Quirk 1985.)

(372) Although Alfonso came to the party, I had fun nevertheless/still/anyways.

(373) Although Alfonso came to the party, I had still fun nevertheless/anyways.

All of these can be found in unconditional structures as well:

(374) Whether or not Alfonso comes to the party, I will have fun anyways/nevertheless.

(375) Whether or not Alfonso comes to the party, I will still have fun.

Therefore, we might wonder whether they were proforms correlated with such structures.

The case for them being any kind of proform is weak. They do not pattern with "then" in a variety of ways. The above examples already illustrate the distributional differences between such adverbs and "then", which must appear sentence-initially in the relevant meaning. Where it is possible to describe "then" as a proform denoting a (plural) set of worlds, with some complex presupposition (Iatridou 1991, 1994), the meaning of the other three adverbs is not nearly so simple. (See Ippolito 2007 for detailed analysis of "still", and König 1986 for discussion of "anyways".)

Even if they were proforms, the case for any of these adverbs being an unconditional proform is also weak. As shown above, they appear in both concessive and unconditional sentences. They can also appear in regular "if"-conditionals:

(376) If Alfonso comes to the party, I will have fun anyways/nevertheless.

(377) If Alfonso comes to the party, I will still have fun.

In such situations, these adverbs appear to force a concessive reading of the "if"-clause, one that could be paraphrased by adding "even". (In general, it is possible to produce concessive

readings of "if"-clauses without "even". The more typical route is to place a minimizer or maximizer in the antecedent; see König 1986.)

Finally, you can use two purported pro-forms at once in such examples[48]:

(378) (Even) if Alfonso comes to the party, then I will still have fun.

In fact, when these adverbs appear in an unconditional, they seem to be doing much the same thing as in (376) and (377), rather than having some interpretive effect directly connected with unconditionality. This can be seen from an "if"-conditional paraphrase:

(379) Whether Alfonso comes to the party or not, I will have fun anyways.

(380) If Alfonso comes to the party, I will have fun anyways, and if he doesn't come to the party, I will have fun anyways.

Therefore, none of these particles are obviously proforms, and they most certainly aren't proforms correlated with unconditionals in particular. If they are proforms, they are concessive proforms.

Let us return to the bigger picture. Unconditionals provide us with no inherent reasons whatsoever for us to believe they involve a correlative structure of the kind described in Bhatt and Pancheva 2006, though there is no technical bar to analyzing them as such.[49] The only reason to believe that they do is if we both (i) want to unify "if"-conditionals and unconditionals, and (ii) believe in a correlative account of the English "if"-conditional. In this chapter, following many other researchers on unconditionals, I have argued for the first point. Therefore, it is sensible to be skeptical of the second point, to the extent my arguments for the first go through. I have also suggested earlier in the chapter that the evidence for the second point is not as strong as might be desired – some arguments point not toward a binding theory of conditionals, but toward a shifting theory. The facts of English are perfectly compatible with a historical source for the "if"-conditional construction as a correlative construction, but not a synchronic analysis of it in that way. Consequently, in the remainder of the dissertation, I will assume a shifting, not a binding, theory of conditionals.

However, as I have tried to emphasize, my main points about unconditionals are to a large degree independent of this choice.[50]

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[48] This fact is due to Ruth Kramer (p.c.). It is really quite puzzling that using "still" should amnesty the use of "then" in such constructions.

[49] In fact it could be seen as a deficiency of the correlative analysis that it is hard to extract such predictions from it; it is sometimes difficult to see what kind of adverbial construction it *wouldn't* allow us to call a correlative in a technical sense.

[50] One slightly disquieting possibility, alluded to earlier in the chapter, is that there are multiple kinds of conditional adjuncts within the LKH category. That is, it is possible that "if"-clauses and unconditionals are both LKH-adjuncts, but one involves binding and the other shifting. It might even be that "if"-clauses involve binding exactly when "then" is present, and shifting otherwise. If there are in fact clear unconditional correlatives in some languages, this possibility becomes harder to ignore. Mandarin Chinese provides a potential case, in the form of "wulun...dou" conditionals (Lin 1996). In these examples the item "dou" obligatorily appears in the main clause, and though Lin does not discuss it in these terms, this is highly reminscent of a real instance of the correlation requirement. But it seems that there are many other environments where "dou" is obligatory as well.

2.4 Summary

In this chapter I have explored the internal and external syntax of unconditional sentences. The main conclusions are summarized in (381).

(381) **Main points of chapter 2**

a. Alternative unconditionals are adjoined alternative interrogative clauses.
b. Alternative interrogatives involve a complementizer "whether", and no A'–movement.
c. Constituent unconditionals are adjoined constituent interrogative clauses.
d. A conditional is any adjunct which serves to restrict the domain of an operator.
e. Unconditionals act like conditionals.
f. Conditionals are best analyzed as plain clausal adjuncts that shift the context of utterance.

2-A Further inconclusive tests for the syntax of constituent unconditionals

Earlier in the chapter, I presented a range of tests used to determine the syntactic nature of constituent unconditionals (S 2.1.3). In this section I discuss several tests used by Gawron 2001 for a similar purpose. However, these are tests that, for purposes of distinguishing a nominal analysis from a CP analysis, or a free relative analysis from an interrogative analysis, are not useful. These tests were introduced to the domain of unconditionals by Gawron in order to argue for a unified analysis of questions, "-ever" free relatives, and unconditionals, distinct from FRs without "-ever".[51] Consequently, they don't decide between any of these structures. The results of these tests are more puzzling for the analysis of "-ever" FRs than they are for anything about unconditionals or interrogatives.

It is important to keep in mind that these tests do provide further evidence that the structure in an unconditional in no way resembles, e.g., a restrictive relative clause.

First, interrogatives, unconditionals, and "-ever" FRs, but not any other "wh" construction, are compatible with "else". This test goes back to Fillmore 1963; Ross 1967; Baker 1968, 1970.

(382) Alfonso talked to who(ever) came.

(383) * Alfonso talked to who else came.

(384) Alfonso talked to whoever else came.

(385) Who (else) came?

(386) Whoever (else) came, they must have talked to Alfonso.

[51] Gawron gathers the tests most directly from unpublished work by John Richardson.

Second, interrogatives unconditionals and "-ever" FRs, but not any other construction involving "wh" items, are compatible with epithets such as "the hell". (However, there may be some restrictions in general on such epithets; den Dikken and Giannakidou 2002 argue that these epithets are polarity items; see also McCawley 1998 p.456.)

(387) * Alfonso talked to who the hell came.

(388) Alfonso talked to whoever the hell came.

(389) Who the hell came?

(390) Whoever the hell came, they must have talked to Alfonso.

Third, interrogatives, unconditionals, and "-ever" FRs all allow "wh"-pronouns that no other "wh"-constructions do, e.g. "what"+NP and "how".

Finally, interrogatives, unconditionals, and "-ever" FRs allow "it"-clefting, but most other "wh"-constructions do not. (This is not as absolute as Gawron's other tests; we do find "it"-clefting in restrictive relatives and pseudoclefts.) This test, when used for distinguishing interrogatives and plain FRs, originates from Baker 1968, 1970.

(391) * Alfonso talked to who it was that came to his office.

(392) Alfonso talked to whoever it was that came to his office.

(393) Who was it that came to Alfonso's office?

(394) Whoever it was that came to Alfonso's office, he should have been polite.

These tests group interrogative clauses, constituent unconditional adjuncts, and "wh-ever" FRs together. Gawron concludes from this that all three have a "question-like" nature. Their question-like nature, for Gawron, appears both in the syntax and semantics. Syntactically, all three constructions are formed from what Gawron calls a pre-question; a CP with features [WH, -QUE]. The morpheme "-ever" serves as a determiner, turning both "wh-ever" FRs and unconditionals into NP/DPs. Questions are built into a CP [WH, +QUE] by a question formation rule. Semantically, pre-questions have a uniform meaning across constructions.

However, I think that it is hard to conclude anything particularly precise about the category of any of the constructions from these tests. Gawron's particular syntactico-semantic conclusions do not follow from these tests; they are at best suggested by them. Nothing about the semantics assigned to pre-questions gives any answer to the question of why these constructions pattern as they do. If we were to form the slightly simpler conclusion that "wh-ever" adjuncts are interrogatives, we would have to assume that "wh-ever" FRs are interrogatives. This conclusion is plausible on certain accounts of free relatives, but not others. Accounts such as Caponigro 2003 that take FRs to be CPs might be compatible with such accounts. The problem is that such accounts take all FRs, not just "wh-ever" FRs, to be CPs. Accounts that take FRs to be DPs, would not be compatible with this conclusion. This data does not block the conclusion that unconditionals are interrogatives in any way; such a conclusion would simply leave the pattern in "wh-ever" FRs as surprising. We cannot conclude on the basis of these

tests that "wh-ever" adjuncts are free relatives, since interrogative clauses are certainly not. I do not think there are any real syntactic conclusions that can be drawn from these tests. If there is a semantic conclusion, it is simply that "wh-ever" FRs are more question-like than plain FRs. Of course, if we take "wh-ever" adjuncts to be interrogatives, these tests present no surprises, except in the domain of free relatives.

This chapter provides an account of the interpretation of unconditionals. In it I give a compositional analysis that derives the characteristic meaning of an unconditional, and the effect of an unconditional on discourse. I focus here on alternative, constituent, and headed unconditionals:

(395) a. Whether or not Alfonso's great at his job, we have to fire him.
Alternative unconditional

b. Whatever Alfonso's good at, we have to fire him. **Constituent unconditional**

c. No matter what Alfonso's good at, we have to fire him. **Headed unconditional**

d. Regardless of what Alfonso's good at, we have to fire him.
Headed unconditional

In chapter 2, I explored the syntax of unconditionals. The main conclusions are that they uniformly involve an adjunct with interrogative syntax (as opposed to a free relative structure), and that they uniformly share a range of structural and distributional properties with "if"-clause conditionals. The goal of this chapter is to develop a compositional analysis that centers around these syntactic results. Previous accounts of unconditionals have to greater or lesser degrees (see chapter 1) stipulated some aspect of the meaning of unconditionals. But here I argue that the syntactic results, and an independently motivated semantics for each, can be combined to give a completely compositional analysis of unconditionals.

Unconditional adjuncts are conditionals in the sense that they serve to restrict the domain of some operator, just like an "if"-clause does (Lewis 1975; Kratzer 1977, 1981, 1986; Heim 1982). That they are closely related to conditionals has been known for some time (see discussion in chapter 2, as well as König 1986; Zaefferer 1990, 1991; Lin 1996; Dayal 1997; Izvorski 2000a,b; Gawron 2001; see also Lin 1996, Giannakidou and Cheng 2006, Cheng and Giannakidou (to appear) on the conditional nature of similar constructions in Mandarin). The new result I offer here is a way of understanding the interpretation of unconditional adjuncts that treats their composition with the consequent in a way exactly identical to the composition of an "if"-clause with its consequent. The crucial formal tool is a compositional Hamblin semantics for questions (Hamblin 1973; Kratzer and Shimoyama 2002).

I analyze the external semantics of an unconditional adjunct as being identical to that of an "if"-clause. Both are antecedents of conditional structures, with the same semantic function. Their semantic function involves introducing temporary assumptions. Internally, the consequent involves interrogative semantics. Applying a Hamblin semantics for interrogatives leads to the introduction of alternatives into the compositional interpretation of the sentence. Following Hamblin 1973 and Kratzer and Shimoyama 2002 (see also Ramchand 1997; Alonso-Ovalle 2006; Menéndez-Benito 2006 among others), these alternatives compose in a "pointwise" way with the operator in the main clause. (See Alonso-Ovalle 2004, 2006, 2007 for a very

similar analysis of disjunction in "if"-clauses.) That is, the operator is unaware that there are multiple alternatives, and composition happens with each alternative in turn. Since the alternatives involved in unconditional adjuncts exhaust the space of possibilities (a consequence of their interrogative nature), the domain of the operator is, alternative by alternative, restricted to every possibility. Further, the operator for each alternative presupposes that its domain is non-empty, resulting in a combined presupposition unique to an unconditional – that each alternative is a possibility. The truth-conditional meaning involves the conjunction of all these different alternatives, leading to the claim that it doesn't matter which alternative is true.

The chapter is structured in four parts. In the first part, §3.1, I review two discussions from the previous chapters: the semantic and pragmatic facts about unconditionals we want to account for (ch. 1), and the syntactic properties of unconditionals (ch. 2). Following this I start in on the second component of the chapter – the compositional interpretation of unconditionals. I focus first on alternative unconditionals in §3.2, and then extend the analysis to constituent and headed unconditionals in §3.3. In the third part of the chapter, §3.4, I return to the empirical and theoretical issues raised in the chapter 1 and reviewed in the first section of this chapter, discussing how they are accounted for on the analysis. In §§3.5 I discuss the interaction of counterfactuality and unconditionals.

Background I assume as background familiarity with the basic notions of the Montagovian semantic tradition as presented by, e.g., Heim and Kratzer 1998. Denotations are given in a typed lambda calculus, and compose mainly via the rule of Function Application and its Hamblin variant. I use the standard types of e and t (with corresponding domains D_e and D_t to identify individuals and truth values, respectively. The type s in this chapter is the type for worlds, corresponding to the domain D_s, the set of all possible worlds. I will also at one point use lambda abstraction over contexts (where a context in the formal sense is basically a Kaplan-style tuple modeling information that would be provided by a discourse context), and so these have the type c.

The formulation of Hamblin semantics I use in the text, adopted from Kratzer and Shimoyama 2002, does not interfere with the type system, though it does replace the standard Function Application with a new rule (I discuss this when it becomes necessary). Denotations consist of alternative sets of formulas. A singleton set containing some formula corresponds to that formula in a more traditional Montagovian system. Certain meanings are difficult to state compositionally in the Hamblin system, in particular those which manipulate alternatives directly, and I give a precise treatment of such meanings in the appendix, showing one way of integrating a compositional Hamblin semantics with the standard type system. I present the details of Hamblin semantics in particular when I develop the analysis.

The lambda calculus convention I use here for expressing types of variables involves subscripting those variables with their type, and using a "." to separate the function arguments from the body. It is roughly the convention of Heim and Kratzer 1998. So "$\lambda w_s . \phi$" is a function from possible worlds (elements in D_s) to ϕ. "$\lambda p_{\langle st \rangle} . \phi$" is a function from propositions to ϕ.

In certain places I will assume that presuppositions involve denotations being partially defined, either on contexts of evaluation, or on arguments to the denotation, or both. I am not committed to a partial theory of presuppositions in particular; it is merely a convenient representation. Even if such a theory is assumed, the notation I use here radically underspecifies the details (see Beaver and Krahmer 2001 for one way of spelling out a partial theory of presuppositions.) The analysis of unconditionals developed here, though it makes use of presupposition, is largely independent of the choice of a theory of presupposition and presupposition projection. When a denotation is partially defined on an argument, I will use one of two notations, whichever is more typographically convenient: (i) I write some presuppositions underlined after a "s.t." (such that) following the variable and before the function body, as in "λx s.t. $\underline{x \text{ is human}}.x$". This an identity function which is defined only for values of x that are human. The underlining is merely a typographic convention to help the presuppositions stand out from the rest of the denotation. (ii) I write some presuppositions following the denotation as definedness conditions on variables in the denotation.

3.1 Review

This section provides a brief review of some properties of unconditionals discussed in chapters 1 and 2.

3.1.1 Semantic and pragmatic properties

The primary topic of analysis is the indifference implication. The main function of an unconditional is to convey a meaning that can be paraphrased with "it doesn't matter".

(396) Whether Alfonso is great at his job or not, we should fire him.
(implication: it doesn't matter whether he's great)

(397) Whatever we do, we'll lose. (implication: it doesn't matter what we do.)

(398) Whichever way we go, we'll get to the beach eventually.
(implication: it doesn't matter which way we go)

In each of these examples, the speaker expresses a kind of relativized indifference toward the alternatives given in the antecedent. By "relativized", I mean that the indifference claim is not absolute – in (396) it may matter tremendously in a general sense to many people, including the speaker, whether Alfonso is great at his job. The indifference is relativized specifically to the question of whether we are compelled to fire him. For purposes of the modal claim, the choice of alternative doesn't matter.

A closely related semantic fact to the indifference claim is that the consequent seems to be entailed. Along with the indifference claim, unconditional examples convey a plain modal claim corresponding to the consequent. (396) above, for example, conveys that we should fire Alfonso. Other kinds of conditionals have this property – some concessive conditionals involving "even" or a scalar endpoint for instance (Bennett 1982, 2003; Lycan 1991, 2001; Guerzoni

and Lim 2007), but not even all concessive conditionals do. (In particular, concessive conditional of the type Bennett termed "standing-if" conditional do not.) Unconditionals have this property across the board.

Both the indifference implication and the entailment of the consequent are part of the at-issue, truth-conditional content. They are not implicated or presupposed.

Unconditionals do introduce certain presuppositions, however. First, they presuppose that the options introduced by the antecedent are the only ones (in a relativized sense). This presupposition is clearest in alternative unconditionals without negation:

(399) Whether Alfonso or Joanna brings the beer, it will be a good brand.

In (399) the speaker presupposes that either Alfonso or Joanna will bring the beer. A more complicated case is in (400):

(400) Whether Alfonso or Joanna comes to the party, it will be fun.

Here we must be clear that the presupposition is not that Alfonso or Joanna are the only ones who might come to the party. The presupposition is that either Alfonso or Joanna will come – the two alternatives jointly exhaust the possibility space. Each alternative may be compatible with a range of other people coming. This exhaustivity presupposition also provides a point of difference from "if"-conditionals, which resist exhaustivity:

(401) Whether Alfonso goes to the party or doesn't go to the party, he will be bored.

(402) # If Alfonso goes to the party or doesn't go to the party, he will be bored.

The second presupposition is the flip-side of exhaustivity: that the alternatives are viable (non-trivial) options. In (400) the speaker presupposes that it is possible that Alfonso comes, and it is possible that Joanna comes. This presupposition becomes more interesting in cases where there are many options:

(403) Whoever comes to the party, it will be fun

Here, we need the truth-conditions to convey that of the individuals we are considering as potential party-attenders in the antecedent, it is possible that each of them will attend. We do not vacuously consider people who might not attend.

Finally, a major difference between plain "if"-conditionals and unconditionals is that unconditionals have a characteristic use in discourse that "if"-conditionals do not have. This is to avoid taking a stance on an interlocutor's claim.

(404) A: Alfonso is really great at his job.
B: Whether or not he's great at his job, we have to fire him.

B in this dialogue uses an unconditional to move the discourse on without taking a stance on whether Alfonso is great at his job or not. Crucially, the consequent of the unconditional

addresses some issue that is under discussion in prior discourse; it is implicit in this example but we can easily see that for this discourse to make sense, the speakers would have to be discussing whether or not to fire Alfonso.

Previous analyses have each captured some of these properties, but never all of them. The goal here is to capture all of them.

3.1.2 Syntactic ingredients

In this section I briefly review the results of chapter 2. This chapter explores the structure of unconditionals, and as such provides the direct ingredients for a compositional semantics of unconditionals.

Most importantly, I argued that unconditionals function as a kind of conditional – they share various distributional properties with conditionals, and have the same kind of interaction with an operator. It is this interaction with an operator that will be important in the next section.

I also argued that both alternative and constituent unconditionals involve interrogative syntax. In particular, constituent unconditional adjuncts are not free relatives. Alternative unconditionals involve the syntax of an alternative interrogative. This means that there is a [Q] feature, and disjunction. Headed and constituent unconditionals involve interrogative syntax as well, but with a "wh"-item. Headed unconditionals of course have a lexical head, to which we can attribute some meaning. This head is in complementary distribution with "-ever" in constituent interrogatives. Note that (as mentioned before) I will be postponing most discussion of "-ever" and the free choice component of disjunction until chapter 4, which is about unconditionals in the context of free choice.

For non-headed unconditionals (e.g. alternative and constituent unconditionals), I argued that there is no evidence for any unpronounced structure containing a concessive or unconditional component. Such adjuncts are bare CPs straightforwardly adjoined. In other words, there is no evidence for a covert unconditional or concessive morpheme. For headed unconditionals, the issue is less straightforward. The same analysis can apply; the heads stand in the same relation to the clause they select for as "if" does to the clause it selects for. On one (extreme) version of this view, the real function of "if", "no matter", and "regardless of" would be entirely selectional, with "if" selecting for declarative clauses, and the other two selecting for interrogative clauses. However, there does seem to be some meaning component to each of these heads, hard as it may be to pin down; I return to this issue in §3.3 and in ch. 4.

Table 7 summarizes the structural components for the three main kinds of unconditional. Components that are either the same or intuitively seem to serve a parallel function for each kind are in the same row.

3.2 Analysis of alternative unconditionals

The goal now is to derive the empirical facts about the meanings of unconditionals (reviewed above) from the syntax, in a compositional way. One of the main aims of the analysis is to

alternative	constituent	headed
conditional adjunct	conditional adjunct	conditional adjunct
main clause operator	main clause operator	main clause operator
[Q] feature	[Q] feature	[Q] feature
disjunction	*wh*-item	*wh*-item
disjunction / final L^-	*-ever*	*no matter/regardless*

Table 7: Structural ingredients of an unconditional

express the idea that unconditionals are literally a species of conditional in a linguistic sense. This section focuses on alternative unconditionals, and then I turn to the other types in §3.3. Throughout this chapter I focus solely on unconditionals involving modals in the consequent, and in this chapter I focus on future-oriented modals.

The analysis is given in a compositional Hamblin semantics (Hamblin 1973; Kratzer and Shimoyama 2002). In a compositional Hamblin semantics all denotations are alternative sets, rather than simple functions. Hamblin semantics was developed to account for the interpretation of questions (Hamblin 1973; Karttunen 1977a; Hagstrom 1998; Lahiri 2002), and recently has been extended to account for a variety of free choice effects (Kratzer and Shimoyama 2002; Kratzer 2005b; Menéndez-Benito 2006; Alonso-Ovalle 2006 among others). Hamblin semantics in general has a number of technical issues that I do not deal with in the body of this chapter. The main point of these technical issues is that Hamblin semantics in its most straightforward form is not fully compositional, and making it compositional is not entirely trivial. Certain meanings, some of which are important to the analysis, are difficult or impossible to express in the non-compositional form. Some meanings, that interact directly with alternative sets, are expressible only by syncategorematic definition. I address these issues in the appendix to this chapter (3-A).

What is the point of Hamblin semantics? One way of thinking about it involves the relationship between "information" and "issues". Intuitively, information is what you attempt to contribute by making an assertion. The issue/information distinction in a Hamblin semantics plays out directly in root clauses. When considering root clauses, the size of the alternative set corresponds with the pragmatic functions of asserting and questioning. If a root clause's denotation is a singleton set, it functions as an assertion, and if its denotation has a cardinality greater than 1, the clause functions as a question. (Here I do not discuss explicitly the relation of the static Hamblin semantics to the pragmatics, but in chapter 4 I do so.)

Asking a question raises an issue, and a non-singleton alternative set represents an issue. This intuition about what an alternative semantics "means" is clear enough when considering the function of an entire utterance, but it becomes much more confusing when you look inside an utterance. What are the semantic pieces of information and issues? The same linguistic tools are used to build utterances that convey information and raise issues, so it seems that the same semantic units should be able to build both issues and information. We might even expect that pieces of information can make up issues, and pieces of issues can make up information.

The structure of an unconditional realizes this expectation. We find interrogative morphology, something that in principle might be tied solely to the construction of issues, used to do something other than build a clause that raises issues. The presence of an unconditional is independent of whether the utterance it appears in acts as an assertion or question, and the unconditional adjunct does not contribute to question meaning when it is adjoined to an interrogative clause. Rather, the function of interrogative morphology in this case seems to be to contribute to conveying an indifference implication. In many other languages we also find interrogative morphology used in a range of constructions that do not involve the speech act of questioning. For example, indeterminate pronouns in Japanese (Kuroda 1965; Shimoyama 2001; Kratzer and Shimoyama 2002 among others), are used in interrogative constructions analogously to English' "wh"-pronouns, but are also used many other quantificational and free choice expressions. The conclusion is that when we decompose issues and information, we can find some of the same pieces in each. Therefore, we need a semantics that can capture this.

Classic Montagovian semantics is in a way concerned mainly with information. It is designed with declarative structures in mind, and can model questions as-is only by using the provided tools in non-obvious ways (e.g. stipulating particular types as being question denotations). Hamblin semantics builds on this traditional approach by using alternative sets to model issues. These sets, on many implementations of Hamblin semantics, are still made up of traditional Montagovian pieces, which can be thought of as pieces of incomplete information, waiting for saturation. Consequently issues consist partly of pieces of information. The Kratzer and Shimoyama semantics goes a step further, and uses the alternative semantics in a variety of ways for modeling free choice, even when the end result is an assertion – building information out of "incomplete issues". Any denotation that involves an alternative set of non-propositional objects can be thought of as an incomplete issue; for instance, a set of predicates.

The key idea is that a compositional Hamblin semantics allows for incomplete issues to play a role in composition, just as a non-Hamblin semantics builds meanings out of incomplete information. In fact, a Hamblin semantics doesn't really care whether the end goal is to contribute information or raise issues. In my analysis of unconditionals, the compositional role of incomplete (and complete) issues is significant – the antecedent of an unconditional denotes an alternative set, and so represents an issue. Unlike the case of issues in a question act, an unconditional's issue does not get raised or resolved. In fact, an unconditional does something nearly the opposite of raising the issue. It conveys that the consequent explicitly does not resolve the issue. (I explore this idea in detail following the analysis, in §3.4.3, where I show that unconditionals introduce a claim that two issues or *orthogonal* in the sense of Lewis 1988.) It is this idea that Hamblin semantics is useful for implementing. Hamblin semantics can model complex interactions of information with issues, including behaviors other than a normal root question meaning, where a question act raises an issue that is to be resolved by an answer.

The remainder of this section proceeds from the bottom of an alternative unconditional up; this is shown in the diagram in figure 2. I start with the semantics for disjunction in §3.2.1, and then proceed to build on that for the semantics for alternative questions in §3.2.2. From

there I go to the semantics of conditionals (§3.2.3), and then to the operators they restrict (§3.2.4). The key point of this analysis comes when the conditional adjunct composes with the modal via pointwise function application, and this is also discussed in detail in §3.2.4. At this point, the analysis is complete.

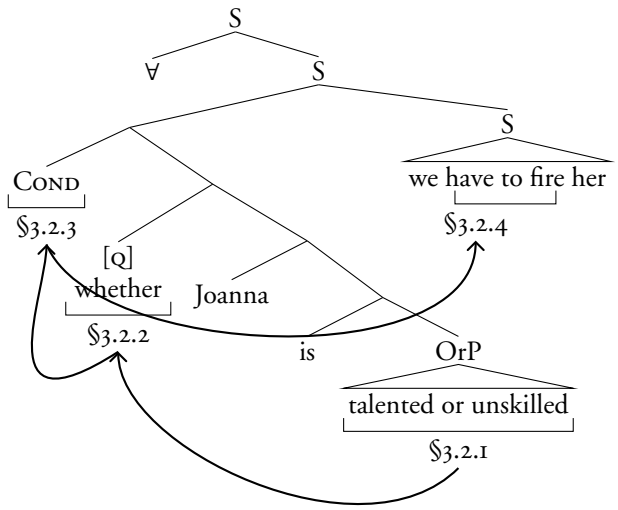


Figure 2: Flow of §3.2

Before proceeding, I want to emphasize an important point about this part of the chapter. I develop an analysis side-by-side with a derivation, but the derivation is not the focus of this section. The reason for this method of developing the analysis is that the resulting semantics for an unconditional follows *entirely* from independently motivated meanings of the pieces. The structure of each section is that I provide the independent motivation, and show how it fits into the semantics of unconditionals.

3.2.1 Disjunction

In the interpretation of an alternative unconditional, disjunction is the starting point. By this, I mean that it is the smallest piece of lexical material that is characteristic of this kind of unconditional. (However, note that order of composition does not matter, and in this system there is no commitment to bottom up composition.) In this section I outline my assumptions about disjunction, and some of the motivation for these assumptions. In the next section I say how these assumptions specifically fit in with the semantics of alternative interrogatives.

Following Alonso-Ovalle 2005; Simons 2005, and at some level of abstraction, Partee and Rooth 1983, I take the interpretation of disjunction to involve the computation of alternatives. The particular formulation I use is in the Hamblin semantics of Kratzer and Shimoyama 2002 (K&S), following Alonso-Ovalle 2005, 2006. A disjunction such as "walk or run" is interpreted

as an alternative set, containing the denotations of each of its disjuncts. More formally, a syncategorematic rule for interpreting disjunction is stated in (405):

(405) $[\![\text{[X or Y]}]\!]^{g,c} \underset{\text{def}}{=} [\![\text{X}]\!]^{g,c} \cup [\![\text{Y}]\!]^{g,c}$

(For a compositional interpretation of disjunction in a Hamblinized grammar, see Appendix 3-A.)

To see how this works, consider again the disjunction "walk or run". Each of these disjuncts, in a non-Hamblinized grammar, would denote a predicate. In a Hamblinized grammar, they simply denote a singleton set containing that predicate:

(406) a. $[\![\textbf{walk}]\!]^{g,c} \underset{\text{def}}{=} \{\lambda x_e . \lambda w_s . x \text{ walks in } w\}$

b. $[\![\textbf{run}]\!]^{g,c} \underset{\text{def}}{=} \{\lambda x_e . \lambda w_s . x \text{ runs in } w\}$

The definition in (405) applies straightforwardly to these singleton sets, giving us

(407) $[\![\text{[walk or run]}]\!]^{g,c} = \{\lambda x_e . \lambda w_s . x \text{ walks in } w, \lambda x_e . \lambda w_s . x \text{ runs in } w\}$

In a Hamblin semantics we must assume that there are operators which then collect alternatives and turn them into more traditional meanings. For disjunction in general, the default operator is the existential operator, $\exists$. This captures the sense in which disjunction has existential force, and can be thought of as corresponding to the scope-closing operation in many analyses of the compositional semantics of disjunction (Larson 1985; Han and Romero 2004). K&S and Alonso-Ovalle assume that Hamblin operators have a syntactic life of their own, at least at LF. I will follow this assumption here. A definition for the existential operator is given in (408):

(408) **Propositional existential operator**

$[\![\exists \alpha]\!]^{g,c} \underset{\text{def}}{=} \left\{\lambda w \in D_s . \exists r \left(r \in [\![\alpha]\!]^{g,c} \wedge r(w) = 1\right)\right\}$

This definition assumes that α is an alternative set of propositions, and from this alternative set builds a singleton set containing a proposition. This proposition is true just in case some alternative in α is true. This is, intuitively, an existential closure operator for alternatives. Given the conceptual setup in the introduction to this section, this can be thought of as the kind of operator that turns issues into information (along with other Hamblin operators). This operator won't play a role in the analysis of unconditionals, but it is important to understanding how classical disjunction plays out in the Hamblin semantics.

The key insight of a Hamblin semantics for disjunction is that there is some disassociation between the disjunctive phrase itself and the way operators interact with the meaning of the disjunctive phrase. This disassociation is in a sense a generalization of the classical view of disjunction in propositional logic, since the classical account falls out as a special case of the Hamblin analysis. (When $\exists$ is the operator collecting alternatives, and no alternative-manipulating items intervene between it and disjunction.) One key reason for generalizing the classical semantics in this way is a property noted by Alonso-Ovalle 2006: the Hamblin

semantics allows, in a restricted way, for the interpretive mechanism to have access to each of the disjuncts during later composition. This is important in analyses of free choice effects in disjunction, where higher items, such as modals, seem to interact with the meaning of each disjunct. It is also important in unconditionals in particular, we will see. The motivation for unconditionals is to avoid what I describe in chapter 1 as the *domain expansion problem*. Many possible analyses of alternative unconditionals fail because a classical approach to disjunction predicts that the alternatives will be collected and closed off to manipulation inside the adjunct. This means that the adjunct will denote an exhaustive proposition, and lead to a vacuous conditional claim. (e.g. $(p \vee q) \rightarrow r$ is equivalent to r for many theories of the $\rightarrow$ operator.)

At this point it is convenient to introduce some further assumptions of the K&S Hamblin semantics. A traditional Montagovian function application rule takes a function, an argument, and applies one to the other. Things are somewhat more complicated in a Hamblin semantics. We may have an alternative set containing several functions, and an alternative set containing several arguments, and wish to put these sets together in an intelligent way. Thus, composition proceeds by what is called "pointwise" function application. (This is one point where the connection to Partee and Rooth 1983 becomes clear; cf. their pointwise $\sqcap$ and $\sqcup$.) Pointwise function application takes every element of the function set and composes each with every element of the argument set, producing a set containing all the combinations. This is something like a Cartesian product operation on sets.

A common case is where one of these sets is a singleton set, and the other a set of size greater than 1. To see how this works, consider (ignoring tense, aspect, and so on) a sentence like "Alfonso walks or runs". Here we have disjunction of predicates that must compose with something of type e. The denotation of a name in a Hamblin semantics is a singleton set containing the classical denotation of that name; e.g. $[\![\textbf{Alfonso}]\!]^{g,c} = \{a\}$. Pointwise function application puts the individual contained in this singleton set together with every element of the set formed by disjoining the predicates. This will give a set of propositional alternatives: $\{\lambda w_s\,.\,a \text{ walks in } w, \lambda w_s\,.\,a \text{ runs in } w\}$.

Another common case involves Pointwise FA operating on two singleton sets. This arises in sentences that lack alternative-introducing items – no disjunction, no "wh"-items, and no indefinite pronouns. In this scenario, Pointwise FA operates in a way isomorphic to a Montagovian FA rule, in putting together the two singleton denotations. It will of course produce another singleton set, which contains the denotation that would be produced by the standard FA rule. For example, if we simply combine $[\![\textbf{Alfonso}]\!]^{g,c}$ with $[\![\textbf{walks}]\!]^{g,c}$, we get $\{\lambda w_s\,.\,\text{Alfonso walks in } w\}$. If we take a Hamblinized grammar where the lexicon contains no alternative introducing or manipulating items, the grammar will be equivalent to a non-Hamblinized grammar, for this reason. (See the appendix for more details.)

More generally, here is the definition for pointwise FA.

(409) **(Hamblin) Pointwise Function Application (FA)** (Kratzer and Shimoyama 2002)
If α is a branching node with daughters β and γ, and $[\![\beta]\!]^{g,c} \subseteq D_\sigma$ and $[\![\gamma]\!]^{g,c} \subseteq D_{\langle\sigma\tau\rangle}$, then $[\![\alpha]\!]^{g,c} \underset{\text{def}}{=} \{a \in D_\tau \mid \exists b \exists c \left(b \in [\![\beta]\!]^{g,w,c} \wedge c \in [\![\gamma]\!]^{g,c} \wedge a = c(b)\right)\}$

For the moment, Pointwise FA is necessary primarily as a tool for understanding how the internals of an unconditional adjunct compose. However, later it will become clear that the pointwise nature of this kind of composition is crucial to the indifference implication.

3.2.2 Alternative interrogatives

The semantics I use for alternative questions, and consequently for alternative unconditional adjuncts, is a straightforward version of a Hamblin semantics for questions. The core of a Hamblin semantics (and many other analyses of questions) lies in what Groenendijk and Stokhof 1997 term "Hamblin's picture" (§4.1 of Groenendijk and Stokhof 1997):

(i) An answer to a question is a sentence, or statement.

(ii) The possible answers to a question form an exhaustive set of mutually exclusive possibilities.

(iii) To know the meaning of a question is to know what counts as an answer to that question.

The compositional Hamblin semantics I am using here is exactly designed to express these ideas, or at least the first and third postulates. The denotation of a question, on this theory, is a set of propositions. Implicit in the first postulate is the idea that answers correspond to propositions. Each of the propositions in the alternative set corresponds to an answer to the question. On this theory, when we know the meaning of a question, we can compositionally compute the alternative set that determines what the possible answers to the question are. I will return to the second postulate shortly, after showing how to compute the denotation of an alternative question.

The core of an alternative interrogative is disjunction. The disjuncts always correspond to possible answers. That is, an alternative question such as (410) always has (at least) answers corresponding to the left and right disjuncts:

(410) Did Alfonso or Joanna bring the salad?

a. Alfonso (brought the salad).

b. Joanna (brought the salad).

The reason these are answers to an alternative question, on the Hamblin account, will be that disjunction compositionally introduces alternatives, which are then supplied to the question operator. Implicit in this idea is that we cannot treat disjunction in an alternative interrogative as a classical disjunction (Karttunen 1977a; Groenendijk and Stokhof 1984; von Stechow 1991; Gawron 2001). In Hamblin terms, it is licensed directly by the Q operator, and not by any covert $\exists$ operator. (If a disjunction is present and licensed by an existential operator, we get a polar question reading.)

This can be captured in the K&S Hamblin semantics straightforwardly by assuming a Hamblin semantics for disjunction, and one version of the [Q] operator that K&S give. This

operator simply lets alternatives through, instead of collecting or manipulating them. For example, on an alternative reading, ⟦Would you like coffee or tea?⟧ gives, roughly, {Hearer would like coffee, Hearer would like tea}. In a root question, the alternatives that are let through go on to serve the pragmatic function of raising an issue. The definition for this trivial Hamblin operator is given in (411).

(411) **Question operator, version 1**
$[\![[\mathbf{Q}\ [\alpha]]]\!]^{g,c} =_{\text{def}} [\![\alpha]\!]^{g,c}$

Obviously, a compositional Hamblin semantics where disjunction is treated in this way makes it very easy to provide a simple and compositional analysis for alternative questions. A Hamblinized denotation for disjunction, a very simple question operator, and pointwise function application are all we need. This analysis is similar also to the one in von Stechow 1991, who proposes that the denotation of an alternative question has a focus semantic value (in the sense of Rooth 1985) that consists of the two alternatives corresponding to the disjuncts. For von Stechow, the question operator converts this focus-semantic value into the question meaning. The Hamblin analysis I am proposing here can be seen as a flattened version of von Stechow's analysis, in the sense that the two dimensions of focus and ordinary semantics are collapsed to one.

K&S discuss a second option for the [Q] operator that is less Hamblin-like. This second operator is based on the Groenendijk and Stokhof 1984 semantics for questions, where an issue denotes a equivalence relation (and therefore a partition) on the set of worlds. Worlds are in the same cell of the partition if they resolve the issue in the same way. Effectively, this alternate denotation converts "issues" from a Hamblin representation, as alternative sets, into a representation as a partition on the set of worlds. What I assume here is that the Groenendijk and Stokhof notion is relevant to the dynamics of question acts – the effect of raising an issue in discourse, whereas the Hamblin notion is relevant to the effect of issues on the compositional semantics. See Groenendijk 1999 for an account of questioning that illustrates the dynamic side of the Groenendijk and Stokhof account. In a sense, the two representations for issues are two sides of the same coin. I develop the dynamic version of this in more detail in chapter 4. For compositional purposes, I will assume that the Hamblin-like denotation for [Q] is what is involved in unconditionals, not the G&S-like version.

Filling out Hamblin's picture: exhaustiveness There is at least one way in which this simple and compositional analysis is not complete; the denotation for the [Q] operator given by Kratzer and Shimoyama 2002 does not fully capture Hamblin's picture, discussed above. In particular, we need to add in an exhaustiveness constraint. We need to do so both for alternative unconditionals, and for alternative questions.

In chapter 1 I discussed certain exhaustivity effects in unconditionals. Unconditionals whose alternatives are not automatically exhaustive are only felicitous if the context makes them exhaustive. In (399) (repeated from earlier), the sentence would only be felicitous if uttered in a context where it is either Alfonso or Joanna who will bring the beer.

(399) Whether Alfonso or Joanna brings the beer, it will be a good brand.

Of course, we might accommodate such a presupposition. There are examples where many speakers find it harder to accommodate exhaustivity; these are cases where an entire scale is not used. Consider the sentences in (412) and (413) in a context where you (the hearer) know nothing about Alfonso's chess-playing skills. The first sentence is exhaustive by virtue of its meaning, and the second one isn't.

(412) Whether Alfonso is good or bad at chess, we have to let him into the club.

(413) # Whether Alfonso is good or mediocre at chess, we have to let him into the club.

In this case, there is a sharp contrast in felicity for most speakers. It is harder to accommodate the exhaustiveness presupposition in this kind of scalar case, and (413) is odd. We can make it felicitous, of course, by explicitly eliminating in conversation the possibility that Alfonso is actually bad at chess. Then, the two alternatives mentioned become the salient ones, and exhaust the possibility space.

My proposal is that the source for this exhaustivity presupposition is from the semantics of alternative questions, and that it is quite general to all such questions. In fact, I take it to be general to questions of all kinds, though its effect will not be so obvious when the alternatives are already exhaustive by virtue of their meaning. I take the question morpheme to be the compositional source of this presupposition, in line with Hamblin's picture. In this proposal I follow the analysis of the presuppositions of questions in Karttunen and Peters 1976.

A more general empirical observation about alternative questions is that they seem to restrict the range of options open to an answerer.

(414) Would you like coffee or tea?

Intuitively, the questioner in (414) seems to be presenting these options as the only ones – even if there is a bottle of whiskey sitting on a nearby shelf, the answerer isn't likely to respond with "whiskey, please". Similarly, in (415), the student is faced only with two options:[52]

(415) (professor asks) Are you going to take the final exam or write a final paper?

If the student didn't already know it, upon hearing (415), they certainly now know that they can't do something other than a final exam or paper in order to pass the class.

Furthermore, it seems like the restriction to the two options is something that the student is already supposed to know – "given" and not new information. Therefore, this restriction seems like a presupposition.

However, it is possible to answer many alternative questions with, e.g. "neither"[53]. In the case of (415) this seems like a smart aleck response, but it does seem more legitimate in the case of (414).

[52] This example is due to Chris Brumwell (p.c.).

[53] I use "neither" to stand in for a host of possible negative or positive responses, and am not attempting to analyze its semantics here beyond assuming that it picks out worlds which would lie outside of either of the two alternatives mentioned in the question.

Given this possible discourse move there are two obvious competing hypotheses about alternative questions: (i) their denotation involves three alternatives, one corresponding to each of the alternatives and one corresponding to the "neither"-type responses, and (ii) their denotation consists of two alternatives, and the "neither"-type responses address a presupposition of the question without answering the question itself.[54] The three-alternative analysis is what has been assumed in one way or another by Karttunen 1977a and Groenendijk and Stokhof 1984, and the two-alternative analysis is what Karttunen and Peters 1976 argues for. (Despite the dates, the Karttunen and Peters paper is an extension of the Karttunen paper, rather than the other way around.) The following summarizes the two possibilities:

(416) **Two-alternative analysis of alternative interrogatives** (Karttunen and Peters 1976)

$$[\![\textbf{Would you like coffee or tea?}]\!] = \left\{ \begin{array}{l} \text{You would like coffee,} \\ \text{You would like tea} \end{array} \right\}$$

Defined only if the hearer must have either coffee or tea, and nothing else.

(417) **Three-alternative analysis of alternative interrogatives** (Karttunen 1977a; Groenendijk and Stokhof 1984)

$$[\![\textbf{Would you like coffee or tea?}]\!] = \left\{ \begin{array}{l} \text{You would like coffee,} \\ \text{You would like tea,} \\ \text{You would like neither coffee nor tea} \end{array} \right\}$$

Note that on the three-alternative analysis, the alternative set will be automatically exhaustive. Any world not present in one of the mentioned alternatives will have to be in the "neither" alternative. Thus there would be no need to state any kind of exhaustiveness presupposition for this data, since exhaustivity is built into the system.

The primary difference between these analyses for root alternative interrogatives is that on the two-alternative analysis, a response like "neither" would not be an answer to the question, but a denial of a presupposition. On a three-alternative analysis it would be a linguistic answer. This by itself is not really useful as an empirical difference, as speakers do not have reliable intuitions about the differences between an answer and a presupposition denial.

The answer/presupposition distinction does lead to various empirical predictions, however. On a three-alternative approach, the "neither"-type response should be generally allowed for any alternative question, but for a two-alternative approach, it will only be allowed insofar as presupposition denials are generally licensed. On this point the two-alternative analysis comes out ahead. I do not know of any real theory for licensing presupposition denials, but it is not surprising that they shouldn't always be good. In particular, the power dynamic in (415) above suggests that it should be difficult for the student to try to deny the presupposition, and in fact a response like "neither" is odd. In the case of the traditional "coffee or tea" example, it is completely unsurprising that this presupposition should be so deniable, as the speaker might be quite wrong in their expectation that the hearer wants something to drink. I take presupposition denials of this kind to be licensed to the extent that they address some

[54] Note that I am ignoring "both"-type answers at the moment. See below.

larger issue that is present in the discourse, or has previously been present in the discourse. The "neither" response to the end-of-the-course question in (415) can be made felicitous if the student goes on to point out that they are not registered in the class, for example.[55]

A second case where predictions of the two analyses differ is in embedded alternative interrogatives under intensional verbs like "wonder", "dream about", "investigate", etc. Attitudes of these kinds generally range over the propositions corresponding to (what would be) possible answers to the embedded question. The two-alternative analysis predicts that the exhaustivity restriction, as a presupposition of the attitude report, should by default be incorporated into the attitude holder's beliefs, desires, etc (Karttunen 1974; Heim 1992). (It further predicts that it might be possible for it to project as well.) The three-alternative analysis predicts that the attitude holder should uniformly wonder (or dream about, investigate, etc.) whether the third alternative is the true one. They cannot do so, and therefore the three-alternative approach fails here; a counterexample follows.

Suppose Alfonso goes to visit his Joanna at her house. He sees a light on in her window, and thinks that she might be at home. He knocks on the door but she doesn't answer. Given the light, it is possible she is just ignoring him, but he notes that it is before 5pm, and therefore she could be at work. Then he starts to think about the possibilities, and realizes that she might well be somewhere else. This scenario cannot be described with the following embedded alternative interrogative:

(418) # Alfonso wondered whether Joanna was at home or at work.

The sentence in (418) inevitably forces us to assume that Alfonso did not consider other options besides home and work. But the three-alternative analysis predicts that Alfonso should also be wondering whether she is at places that are neither home nor work. So evidence from the interpretation of alternative questions under attitude verbs suggests that exhaustivity is a real presupposition.

Finally, once it is accepted that unconditionals are syntactically alternative interrogatives, they themselves provide a piece of evidence for the two-alternative view. If their alternative set included the "neither"-cases, we would really expect them to quantify over these cases. However, alternative unconditionals do not involve considering cases other than those mentioned in the alternatives. The two-alternative analysis predicts that the presupposition that the mentioned alternatives are the only ones should project, and become a presupposition of the whole sentence, and this is again the right prediction. A three-alternative analysis makes the wrong prediction here.

I have called this presupposition an exhaustiveness presupposition because it matches a certain kind of exhaustiveness discussed by Groenendijk and Stokhof 1984. Note that this is *not* the kind of exhaustiveness involved in exhaustifying disjunctive alternatives when calculating scalar implicatures (Fox 2006). Rather it is the kind of exhaustiveness specified by Hamblin's picture, which is different. What "exhaustive" means here is that, given some domain of interpretation, and thinking of the possible answers as propositions, every world in

[55] Thanks to Michael Wagner for pointing this out.

that domain must be a member of some possible answer. (Relative to Hamblin's Picture, the scalar-alternative kind of exhaustiveness might be better called exclusivity.)

What exactly is exhausted? Following the dynamic treatment of questions in Groenendijk 1999, I take the domain of exhaustiveness to be contextually determined. In fact, in Isaacs and Rawlins 2008 we argue extensively for this view, on the basis of the analysis of conditional questions. In particular, we argue there that it is really the context set (in the sense of Stalnaker 1978) that exhaustivity is calculated against. A context set determines what is possible in view of the mutual beliefs of discourse participant; the alternatives introduced by a question in that context set must cover those possibilities. A technical notion of this sense of exhaustiveness (which will shortly form a component of the denotation of [Q]) is given in (419):

(419) $\text{Exh}_D(\alpha) \underset{\text{def}}{=} \forall w \in D : \exists p_{\langle st \rangle} \in \alpha : p(w) = 1\}$

I am assuming that α is an alternative set of propositions, and D is some set of worlds representing the domain.

The definition in (420) adds an exhaustiveness presupposition to the Hamblin question operator given earlier.

(420) **Question operator, version 2** $[\![[\text{Q}\ [\alpha]]]\!]^{g,c} \underset{\text{def}}{=} [\![\alpha]\!]^{g,c}$
defined for g, c only if $\text{Exh}_{cs_c}([\![\alpha]\!]^{g,c}) = 1$

In terms of its at-issue meaning, this operator still trivially passes alternatives through. The denotation of a question clause is the set of alternatives denoted by the sister of the question operator. The presupposition is not trivial, though – it is satisfied only if the alternatives denoted by α cover the domain cs_c at the index world. It is not satisfied if there are worlds in the domain not contained in some alternative – that is, if the contextual domain licenses some options that were not mentioned. Because this domain is the context set, the result is that the mentioned alternatives must include every possibility in the mutual beliefs of discourse participants. The import of this presupposition for alternative questions is that the context set can't include possible worlds where neither of the alternatives introduced by the disjuncts is true.

This question operator can be used as-is in an unconditional adjunct. Is Hamblin's picture compatible with such a move? That is, does it still make sense to think about "possible answers"? One of the compelling facts about Hamblin's picture, as Groenendijk and Stokhof 1997 describe it, is that the concepts involved are actually quite abstract and flexible. In a question embedded under an attitude verb, we can consider what the answers would be to the question, and reason accordingly about the semantics. More concretely, we can think about, instead of answers to a question, resolutions of an issue. The formal machinery will continue to work either way. The same move can be made for an unconditional adjunct. An unconditional takes possible resolutions to the issue supplied by the adjunct, and does something different with them than e.g. a question-embedding verb.

The denotation of an unconditional adjunct up to the question operator, would therefore look as follows (expanding the layers of definition):

(421) Example composition step 1: alternative interrogative CP (exhaustivity only)
$[\![\textbf{whether Alfonso dances with Joanna or Fruela}]\!]^{g,c} =$

$$\left\{ \begin{array}{l} \lambda w_s\,.\text{A. dances with J. in } w, \\ \lambda w_s\,.\text{A. dances with F. in } w \end{array} \right\}$$

defined for c only if $\forall w' \in cs_c : \exists p_{\langle st \rangle} \in \left\{ \begin{array}{l} \lambda w_s\,.\text{A. dances with J. in } w, \\ \lambda w_s\,.\text{A. dances with F. in } w \end{array} \right\} : p(w') = 1$

The presupposition ensures that every world in the context set is a part of some alternative. Since the alternatives involve Alfonso dancing with Joanna or Fruela, the presupposition is that he must dance with one of them. Note that in the case of some alternative interrogatives, e.g. those involving "or not", this presupposition will always be satisfied, as the alternatives involved will carve the complete domain of worlds in half. In the case of the two alternatives above, however, the presupposition is not trivial. There might well be some third person who Alfonso could dance with, given what the discourse participants believe.

While the alternatives exhaust the context set, nothing requires the context set to exhaust the alternatives – there may well be worlds in one alternative or the other that do not appear in the context set. This is exactly what we want. For example there may be worlds where Alfonso dances with Joanna while wearing a top hat, but we have recently been discussing the fact that he hates top hats and won't ever wear one. And so on.

Filling out Hamblin's picture: mutual exclusivity There is one missing piece of Hamblin's picture; this is the idea that possible answers to a question, or in our terms, resolutions of an issue, are mutually exclusive. In fact, nothing I have said so far prevents alternatives from overlapping, and the denotation of an alternative question would consequently involve overlap of alternatives on worlds where both alternatives are true. This, if we are to accept Hamblin's picture, is not what we want.

There are various possible solutions we could take to this problem. One, following Groenendijk and Stokhof 1984, is to exclusify the two mentioned alternatives in the semantics, and add another cell corresponding to "both". That is, in the canonical example ("would you like coffee or tea?") we would generate an alternative that involves only coffee, an alternative that involves only tea, and an alternative that involves both coffee and tea. The difference from the approach up to now is that there is no "only" involved in the way I have computed alternatives. This strategy for dealing with mutual exclusivity is the same as for "neither"-type answers, and we can explore the same lines of reasoning above to see if this is the correct solution for alternative questions. Another approach would be to exclusify alternatives without adding such a partition. Then, the exhaustiveness presupposition will exclude worlds where both alternatives are true. Another strategy might be to exclusify the alternatives in the pragmatics, in the same way as for Gricean accounts of scalar implicatures in disjunction (cf. Sauerland 2004).

I do not wish to take a complete stand on the proper treatment of exclusivity here. What is clear empirically, though, is that it is necessary to have it in the semantics for the interpretation of alternative unconditionals, and we have to take some version that excludes the "both"-worlds from consideration. Consider a scenario where we are planning a potluck, and we need two

more dishes to have enough food, but just one more won't be enough. In this scenario, (422) will be true:

(422) Whether Alfonso brings a salad or an entree, we won't have enough food.

However, if there were a "both" alternative involved in the semantics of the adjunct, we'd expect the sentence to be false in this scenario. For the same reason, if there were no mutual exclusivity at all and the alternatives simply overlapped on worlds where he brought both, we'd expect the sentence to be false as well. Consequently, we must have exclusive alternatives in the semantics, and there must not be an alternative containing those worlds where both alternatives are true. A further consequence is that if one is assuming a pragmatic theory of exclusivity, it must be the kind of theory that "strengthens" implicatures into the presupposed or at-issue content of the clause (Chierchia 2005; Fox 2006).

Here I take the approach of building mutual exclusivity into the meaning of a question as a presupposition. The presupposition is exactly parallel to the exhaustivity presupposition, and also relativized to the same domain.

(423) **Mutual Exclusivity**

$$\text{MutExcl}_D(\alpha) \underset{\text{def}}{=} \forall w \in D : \forall p, q \in \alpha : \begin{pmatrix} p = q \\ \vee \neg(p(w) \wedge q(w)) \end{pmatrix}$$

(424) **Question operator, version 3** $[\![[\mathbf{Q}\ [\alpha]]]\!]^{g,c} \underset{\text{def}}{=} [\![\alpha]\!]^{g,c}$

defined only if (i) $\text{Exh}_{cs_c}([\![\alpha]\!]^{g,c}) = 1$ (*Exhaustivity*)
(ii) $\text{MutExcl}_{cs_c}([\![\alpha]\!]^{g,c,} = 1$ (*Mutual exclusivity*)

The mutual exclusivity presupposition prevents any two propositions in the alternative set from sharing a world, unless of course they are the same proposition.

The denotation for an example alternative interrogative clause, adding on mutual exclusivity, would therefore look as follows. To illustrate the details, I have expanded the Exh and MutExcl operators, though in the future I will tend to leave them unexpanded.

(425) Example composition step 2: alternative interrogative CP (complete)
$[\![\textbf{whether Alfonso dances with Joanna or Fruela}]\!]^{g,c} =$

$$\left\{ \begin{array}{l} \lambda w_s\,.\text{A. dances with J. in } w, \\ \lambda w_s\,.\text{A. dances with F. in } w \end{array} \right\}$$

defined for c only if

(i) $\forall w \in cs_c : \exists p_{\langle st \rangle} \in \left\{ \begin{array}{l} \lambda w_s\,.\text{A. dances with J. in } w, \\ \lambda w_s\,.\text{A. dances with F. in } w \end{array} \right\} : p(w) = 1\}$

(ii) $\forall w' \in cs_c : \forall p, q \in \left\{ \begin{array}{l} \lambda w_s\,.\text{A. dances with J. in } w, \\ \lambda w_s\,.\text{A. dances with F. in } w \end{array} \right\} : p = q \vee \neg(p(w') \wedge q(w'))$

The result of the presuppositions are that all worlds in the context set will be worlds where Alfonso dances with Joanna or Fruela, and no worlds in the context set will be ones where he dances with them both.

On the intonational contour of alternative interrogatives In chapter 2 I discussed the intonational contour of alternative interrogatives. There, the focus was on what properties an alternative interrogative has. Here, we must consider the semantic effect of this intonation contour, if any. Bartels 1999 describes the crucial part of the contour as a final falling tone (L^-) along with pitch accents on each disjunct. Bartels proposes that the pitch accents themselves are not inherently meaningful, but that the falling tone leads to an exhaustiveness presupposition along the lines I have described in the previous section.

The proposal that it is the final falling tone that is imported is supported by Pruitt 2008. Pruitt experimentally varies the pitch contour and finds that the final tone, not the pitch accents, are the cues to disambiguating between a polar and alternative reading of a root question. At the same time, this demonstrates conclusively that the final falling tone is a formal feature of alternative questions. Interestingly, in the typology of speech-act-related intonational contours discussed by Bartels, the final falling tone on alternative questions seems to be by far the most descriptively stable.

This proposal for exhaustiveness being associated with a final L^- pitch was independently made by Zimmermann 2000 for conjunction structures, including disjunction. There, however, Zimmermann treats the exhaustiveness claim as part of the at-issue contribution of the conjunction structures, rather than a presupposition.

Given these proposals for the meaning of a final L^- in disjunction structures, it is possible that my earlier proposal, which builds exhaustiveness into the question operator, is simply a first approximation. This intonational contour is independent in the general case from the question operator, and if it contributes meaning, should contribute it independently. Alternatively, we might imagine that the final falling tone has become lexicalized as a formal marking for alternative questions in particular because they so often express non-trivial exhaustivity, but has no semantic contribution in that can be disentangled from alternative question meanings. I will not try to differentiate these possibilities here, and for purposes of understanding the meanings of alternative unconditionals it does not matter.

These alternatives do seem to make different predictions for other kinds of unconditionals. Associating exhaustiveness with the final falling tone predicts that no such presupposition will be present for constituent unconditionals. However, if such a presupposition is present, its effect will be vacuous in any case, in light of the analysis of "-ever" in chapter 4. There I argue that "-ever" contributes a presupposition that the intensional domain of quantification is wide. Such a presupposition will entail the exhaustiveness claim.

I turn now to the details of the treatment of conditionalization.

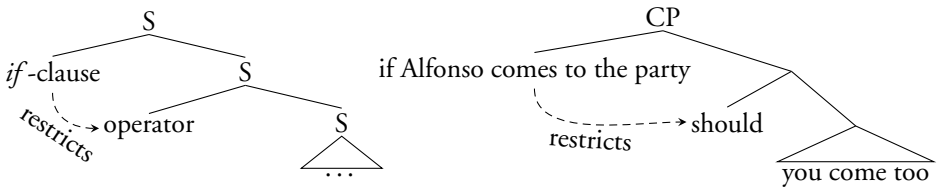
3.2.3 Conditional adjuncts, domain restriction, and modals

What Partee 1991 refers to as the Lewis-Kratzer-Heim (I abbreviate this as LKH) theory of conditionals (Lewis 1975; Kratzer 1977, 1981, 1986; Heim 1982) is this. The traditional theory of conditionals as involving a two-place operator is (as Kratzer 1986 puts it) a syntactic mistake. An "if"-clause is a tool for restricting the domain of an operator, such as a modal or adverb of quantification. Another way of thinking about this is that the "if"-clause serves to introduce

some premise or assumption into the background of the conversation. I will focus on modals here, and use a version of Kratzer's semantics for modals. So an example like "If Alfonso comes to the party, you should come too" considers cases where Alfonso comes to the party and you do what you ought, and says that in all of those cases you come. The general idea is schematized in (427).

(426) If Alfonso comes to the party, you *should* come too.

(427)



In the previous chapter I argue that unconditionals are a species of conditional, in the sense of the LKH theory of conditionals. That is, like "if"-clauses, unconditional adjuncts serve to restrict the domain of some operator. This is not a new idea in semantic analyses of unconditionals. König 1986 argues on morphological and cross-linguistic grounds that unconditionals and conditionals are closely related. Zaefferer 1990, 1991 also argues for a close relation, giving a semantics for unconditionals that differs only from conditionals in terms of its felicity conditions. Lin 1996 treats a closely related construction (sentences with "wulun"-adjuncts) in Mandarin Chinese like a conditional, and Cheng and Giannakidou (to appear) provide further evidence for this view (see also Giannakidou and Cheng 2006). Izvorski 2000a,b argues that constituent unconditionals are "weak adjuncts" in the sense of Stump 1985 – this is a way of saying that they are conditional-like but don't involve "if". Gawron 2001 argues extensively that unconditionals are a species of conditional. The semantic analysis Gawron provides connects unconditional adjuncts with their main clauses by an operation described as a "topic-like" construction, connecting this to the idea of Partee 1991 that in general conditional-like operators might be designed to connect topics with main clauses (see Haiman 1978; von Fintel 1994 for further discussion of the connection between conditionals and topics.) Huddleston and Pullum 2002 also classifies unconditionals as a sub-species of conditional, on the basis of interpretive similarities with "if"-conditionals.

The analysis I present here builds on all of these ideas. It introduces two new properties which I believe are significant. First, I do not differentiate, except as a matter of adjunct-internal syntax, between "if"-conditionals and unconditionals in any way. Their compositional interpretation is the same, and differences follow entirely from the contents of the adjunct. This has been aimed at, particularly by Gawron 2001, but not to my knowledge previously achieved. Second, I derive the semantics in a way that is entirely unsurprising and compositional, given the morphology that is present. The semantics I use for interrogatives is one that could be (and often is) used for an interrogative anywhere. This differs from Gawron 2001, which treats unconditionals as (roughly) an incomplete interrogative that is used to form an NP, and from Zaefferer 1990, which though it derives a very similar interpretation to mine, does not connect the interrogative morphology to the semantic analysis of other interrogative

constructions. Both of these analyses in one way or another give a specific rule of interpretation that applies to unconditionals and only to unconditionals, and this is something that my analysis does not do.

In chapter 2 I also discussed several alternative ways of implementing the LKH theory. There are, roughly, three possibilities. One is that at LF (in one way or another) there is a configuration whereby a conditional adjunct is in a position to compose directly with the operator it restricts, in the manner of the restrictor of a determiner quantifier. The second is that the conditional adjunct binds a variable that composes with the operator, or binds an index on the operator itself. This idea has been pursued by von Fintel 1994 and more recently by Schlenker 2004; Bhatt and Pancheva 2006 in treating "if"-clauses as definite descriptions and correlative adjuncts respectively. Finally, we might imagine that an "if"-clause shifts the context of interpretation so as to add its restricting information into the context. This is in a way the most traditional of these three approaches, as it is basically what Kratzer assumes, and is also most closely in accord with a key conclusion of Isaacs and Rawlins (to appear): that "if"-clauses restrict a speech act operator, not directly a modal operator. I will adopt the third of these possibilities here. However, it does not matter which approach is used – in fact any could be substituted into my analysis with no effect on the interpretation. (See Rawlins 2008b for an implementation of the same analysis in terms of the binding theory.)

On any of these analyses we must have some theoretical notion of what makes an adjunct a conditional adjunct (as opposed to, e.g. a concessive or causal adjunct). In the movement theory, we need some way of formally specifying that the clause is to move (and perhaps, how). Similarly, in the binding theory, we need some way of specifying that the adjunct is a correlative-type adjunct. In the shifting theory, we need some way of specifying that the meaning of the adjunct is the kind of thing that performs a context-shifting operation.

For "if"-conditionals, the obvious answer to the question of what makes an "if"-clause a conditional seems to be the word "if". However, there are several reasons why this isn't satisfactory as a general answer. First, we have seen in chapter 2 that there are many conditional-like structures that don't have the word "if". This reason is of course highly salient to an understanding of unconditionals. Second, "if" is actually an interrogative complementizer, not something specific to the marking of conditional structures. It is very common for languages to use interrogative complementizers in this way, but there are a range of other types of marking (Traugott 1983). (Of course it is perfectly possible to suppose that "if" has become ambiguous; I return to this in chapter 4.)

If not "if", what makes a conditional adjunct conditional? Aside from their structural position, the range of conditional-like adjuncts discussed in chapter 2 lack any unified morphological marking altogether.[56] It is therefore clear that any common property is going to have to be abstract, in the sense of not being morphologically realized in any consistent way.

Here I put the work into an abstract conditional operator. I take the lexical source of this operator to be a feature on complementizers (see chapter 4 for more discussion; here I will

[56]Actually, the unconditional/"if"-conditional system uniformly involves interrogative marking. I develop this idea further in chapter 4. But this is a highly English-specific situation.

generally represent it separately in trees). At LF, the operator takes scope over the clause it appears on. The meaning of this operator is simple and general: it composes with a clause, and restricts a conversational background (supplied by context) with the content of that clause. A conversational background, in Kratzer's work, is a function from worlds to functions that characterize sets of propositions. They represent sets of premises that lurk in the backgrounds of conversations, and are the basic building block of modal reasoning.

How can a feature be an operator? In general in this dissertation I take any feature that is marked as interpretable to in fact be interpretable. That is, such features have a semantics and enter into semantic composition. (I will not always write the "i" when it is obvious that the feature is interpretable.) This raises the question of what happens when one lexical item has multiple features, e.g. iQ and iCond. We therefore need some theory of how such features compose. I will assume in LF representations that such features move to seperate nodes, and in particular that iCond moves to adjoin immediately above its lexical source. There are obviously many details of implementation that this ignores, but by and large they are not relevant.[57]

Intuitively what this operator marks is the semantic function of an adjunct. Any adjunct with the Cond feature will have the function of conditionalization. There are reasons to be suspicious of this kind of analysis. The primary one is that in English there is no consistent marking for the whole class of conditional-like adjuncts, and in fact, I don't know of any language where there is such consistent marking correlating with adjunct function. The generalization, rather, is that there typically seems to be some kind of adjunct that is descriptively identified as the core exemplar of a function, and a bunch of other adjuncts that have the same function but not the same marking. However, it is clear that if there is to be a unified analysis of conditional-like adjuncts at all, at this stage of our understanding of clausal adjuncts, we need some operator of this kind. In a way, the conditional operator I develop here can be thought of as a placeholder for part of a more general theory of clausal adjunct systems. This is similar to the label "weak adjunct" that Stump 1985 used to describe certain conditional-like adjuncts. However, the operator I discuss here is more concrete than the idea of a weak adjunct; it is an independent compositional unit that can be combined in a very general way with a large class of adjuncts. In fact, though I do not demonstrate it here, I believe its meaning to be general to nearly the full range of conditional-like adjuncts. I return to the issue of the conditional operator and semantic function in chapter 4. There, I argue (among other points) that this operator serves not just to lead to the meaning of a range of conditional-like adjuncts, but also to the distribution of these adjuncts. In particular, I use it as the linchpin of a theory of the distributional relationship between interrogative clauses in complement position and in adjunct position.

Now let us proceed to the formal details of the conditional operator. First I build up several auxiliary notions, and give the complete definition of the operator below in (430).

[57] An alternative, which would do just as well, is if the features have some structure internal to the lexical item, and compose to build a complex meaning for the lexical item. The semantics for iQ and Cond would need to be somewhat different that what I assume in the text, but the assumptions that would be needed are quite straightforward.

The conditional operator's job is to introduce assumptions into the background of the conversation. For Kratzer, this background corresponds to the modal base used in the interpretation of modal operators in the scope of the conditional adjunct. What I assume here, following Isaacs and Rawlins 2008, is that the restriction of modal bases is mediated by the context set. That is, the context set is the core notion involved in the background of the conversation.

Consequently, the conditional operator will have to manipulate the context of utterance compositionally. In particular, to implement the conditional operator compositionally, we need to be able to abstract over contexts – the conditional operator modifies the context of its second argument. Assuming a domain of contexts D_c, the appropriate type-shift can be defined as follows:

(428) **Type-shift for a context shifter**
If β's basic type is X, and it would normally be interpreted relative to g and c, then β can also compose as type $\langle cX \rangle$, in which case it is interpreted as
a set $R \subseteq D_{\langle c\langle st\rangle\rangle}$ s.t. $\forall c' \in D_c : \exists f \left(\begin{array}{ll} & f \text{ is a bijection from } [\![\beta]\!]^{g,c'} \text{ onto } R \\ \wedge & \forall p \in \mathrm{Dom}(f) : f(p)(c') = p \end{array} \right)$

This definition is complicated by the fact that we need to refer to the context set in determining what the alternative set denoted by β is. Consequently, simpler attempts that try to directly define the functions in the type-shifted denotation directly will not be coherent.[58] It gives us an alternative set of functions of (non-Hamblin) type $\langle c\langle st\rangle\rangle$, each one of which guarantees that the results of applying a context to that function are identical to the results of computing the denotation of β relative to that context.

With this machinery out of the way, let us return to the denotation of Cond. One option, following Kratzer most directly (Kratzer 1981, 1991), would be to have this conditional operator act directly on the modal base that will be used in the interpretation of the main-clause modal. I assume a more indirect model of domain restriction here, following Isaacs and Rawlins 2008, which in turn follows much work on conditionals in dynamic semantics . On this view, an "if"-clause contributes its restriction to a Stalnakerian context set that forms part of the context.[59] Operators in the scope of the "if"-clause use the modified context set, not the original one, to constrain their domain of interpretation.

To express this, I will first give some convenient notation:

(429) **Context set update (static)**
If $c = \langle ..., cs_c, ... \rangle$, then
$c + p \underset{\text{def}}{=} \langle ..., cs_c \cap p, ... \rangle$

Intuitively, this is a static version of the standard dynamic update procedure.

Finally, these pieces can be put together into a denotation for the conditional operator.

[58] For example, we might try something like $\left\{ r \in D_{\langle c\langle st\rangle\rangle} \mid \exists p \in [\![\beta]\!]^{g,c'} : r = \lambda c'_c \,.\, p \right\}$; but this kind of definition always results in the first instance of c' being unbound.

[59] Equivalently, the restriction could be added as a proposition to the common ground.

(430) $[\![\textsc{Cond}]\!]^{g,c} = \{\lambda p_{\langle st\rangle} . \lambda p'_{\langle c\langle st\rangle\rangle} . \lambda w_s . p'(c+p)(w)\}$

What a conditional operator does is to take the content of a conditional adjunct, and use that content as a contextual restriction for anything in its scope (the consequent). A modal will use the restricted context set to limit the worlds it examines for the modal claim. The type this gives a conditional adjunct of any kind is ⟨⟨c⟨st⟩⟩⟨st⟩⟩, a sentence operator.

Modals The missing piece at this point is an analysis of modals, and an explication of exactly how they interact with the restrictions/background assumptions imposed by conditionals. I assume a version of Kratzer's semantics for modals.

Modals, on Kratzer's account (Kratzer 1977, 1981, 1991) are quantificational operators on possible worlds that are parameterized in two ways. There is a modal base, and an ordering source.

The modal base determines the broad character of the worlds looked at by the modal operator. There are epistemic modal bases, which include all the facts that are known. (For the special case where we are considering publicly known facts, the common ground is effectively a modal base of this kind.) There are circumstantial modal bases, which focus in on particular circumstances that are relevant to the discourse. There are, finally, empty modal bases, where we exclude all sources of external information from consideration. (Empty modal bases, for Kratzer, are only used when there is a conditional adjunct to supply some information internal to the utterance; for counterfactuals, and strict material implication.) The modal base supplies the modal's domain of quantification for Kratzer – we never look outside of it. What I assume here is that the modal base is always intersected with the context set. This means that we always focus in on the part of the modal base that is compatible with the mutual public beliefs of discourse participants.[60]

The ordering source is used to rank information in the modal base in certain ways. For instance, a deontic ordering source orders worlds according to how close they come to some deontic ideal – what some code of laws says. A bouletic ordering source does something quite similar, except with an individual's wishes as the guide.

An intuitive definition for a modal like bouletic "should" given these parameters, then, is that all those worlds that are closest to the speaker's wishes, drawn from some circumstantial modal base, make the proposition in the scope of the modal true. Unfortunately, things are not quite so simple – we cannot assume that there is a well-defined set of *the* closest worlds. In Lewis's 1973 terms, we cannot make the Limit Assumption. The necessary definitions, taken from Kratzer 1981, are given here.

(431) **Ordering of worlds** ($\leq_A$)
For all worlds w and $z \in \mathcal{W}$:
$w \leq_A z$ if and only if $\{p : p \in A \text{ and } z \in p\} \subseteq \{p : p \in A \text{ and } w \in p\}$

[60] Something more must be said for counterfactuals. I follow von Fintel 2001b in assuming that the "modal horizon" is expanded when we consider counterfactuals, to introduce worlds into the domain that are compatible with the counter-to-fact assumption in the antecedent. See also Isaacs and Rawlins 2008 for explication of this idea.

(432) **Human necessity**

A proposition p is a human necessity in a world w with respect to a modal base f, and an ordering source g if, and only if, the following condition is fulfilled:

For all $u \in (\bigcap f(w))$ there is a $v \in (\bigcap f(w))$ such that

(i) $v \leq_{g(w)} u$

and

(ii) for all $z \in (\bigcap f(w))$: if $z \leq_{g(w)} v$, then $z \in p$

The notion of "human necessity" in (432) expresses the closeness idea without assuming that we can identify the closest worlds. Given this, we would say that bouletic "should" expresses human necessity with respect to a circumstantial modal base, and a bouletic ordering source.

For Kratzer, the domain of quantification for modals is entirely provided by the modal base. Here I am also taking the context set to limit the domain of quantification. What this means technically is that we must modify the denotation above slightly to take it into consideration. What I will do here is give the general notion of human necessity in terms of a domain, instead of a modal base. The fact is, that on Kratzer's definition, the contents of the modal base viewed as a set of propositions are not needed – only their intersection is used. Below I will then supply the domain as $cs_c \cap \bigcap f_c(w)$ for the domain D.[61]

(433) **Human necessity (version 2)**

A proposition p is a human necessity in a world w with respect to a set of worlds D, and an ordering source g if, and only if, the following condition is fulfilled:

For all $u \in D$ there is a $v \in D$ such that

(i) $v \leq_{g(w)} u$

and

(ii) for all $z \in D$: if $z \leq_{g(w)} v$, then $z \in p$

There is a further addition to this familiar picture that I would like to suggest, and that is that modals presuppose that their domain of quantification is non-empty. For universal modals, it effectively amounts to a ban on vacuous quantification. A universal should not be true in virtue of its domain being empty. Since conditional adjuncts contribute to the domain, they will have an effect on this presupposition. For "if"-conditionals (barring familiar paradoxes that are best solved by amending the semantics of conditionals in other ways), this will have a positive effect that seems so obvious as to hardly need stating. In fact, it is really a restatement of appropriateness conditions for indicative conditionals suggested by Stalnaker 1975: "It is appropriate to make an indicative conditional statement or supposition only in a context which is compatible with the antecedent." In the wake of the LKH theory, this appropriateness condition is best displaced to the modal. The presupposition will not be met

[61] One interesting possibility is that we might do away altogether with the distinction between a modal base and the context set. The way they are used here, there is a significant overlap in function. The use of circumstantial modal bases does allow us to focus in on parts of the context set if necessary, without changing the context set itself, but perhaps a more articulated theory of discourse context would also allow us to do this.

when the "if"-clause's content is contradictory with itself or preceding assumptions. The non-triviality presupposition (or Stalnaker's appropriateness condition) is empirically justified, as it makes no sense to have a contradictory "if"-clause (setting aside counterfactuals). This can be seen from the following incoherent discourse:

(434) Alfonso is tall. #If Alfonso isn't tall, he shouldn't play basketball.

The modal "should" takes a circumstantial or epistemic background, and because of the structure of discourse, the content of the first sentence will contribute to this background. It is taken for granted in our premises that Alfonso is tall. The "if"-clause then attempts to assume the opposite, and makes no sense.

In the case of an unconditional, however, this presupposition becomes important. This is because composition with the main clause proceeds in a pointwise way, as the next section discusses. First, here is a complete denotation for a modal. I have underlined the non-triviality presupposition:

(435) Example composition step 3: denotation for "should"
$[\![\textbf{should}]\!]^{g,c} =_{\text{def}}$
$\left\{ \lambda p_{\langle st\rangle} . \lambda w \text{ s.t. } \underline{cs_c \cap \bigcap f_c(w) \neq \emptyset} . \right.$
$\left. \qquad p \text{ is a human necessity in } w \text{ with respect to } (cs_c \cap \bigcap f_c(w)), \text{ and } g_c \right\}$
defined only if f_c is a circumstantial conversational background and g_c is a deontic conversational background.

I am using $\bigcap f_c(w)$ here as a convenience notation for $\{w' | \exists p \in f_c(w) \text{ s.t. } p(w')\}$, as Kratzer does – in the context of Hamblin semantics it is more important to think of this as a convenience of notation.[62] The basic idea is that the argument to "should" follows from the premises given by f_c. There are two presuppositions, the non-triviality presupposition (underlined) given by making the resulting denotation partially defined on w, requiring the intersection of the premises to be non-empty, and the second restricting the kinds of conversational background the conversation can provide.

Given a sentence, we can compute the complete consequent of an unconditional as follows:

(436) Example composition step 4: complete main clause
$[\![[\textbf{should } [\textbf{Alfonso be polite}]]]\!]^{g,c} =$
$\left\{ \lambda w \text{ s.t. } \underline{cs_c \cap \bigcap f_c(w) \neq \emptyset} . \left(\begin{array}{l} (\lambda w' . \text{Alfonso is polite in } w') \\ \qquad \text{is a human necessity in } w \\ \qquad \text{with respect to } (cs_c \cap \bigcap f_c(w)), \text{ and } g_c \end{array} \right) \right\}$
defined only if f_c is a circumstantial c.b. and g_c is a deontic c.b.

The denotation of a sentence like "Alfonso should be polite" is a singleton set containing a partially defined proposition – defined only for worlds and contexts relative to which the

[62] Alternatively, conversational backgrounds could be thought of as functions from worlds to alternative sets. In the notation of the appendix, then, they would be objects of type $\langle s \boxed{\langle st\rangle t} \rangle$, instead of type $\langle s\langle\langle st\rangle t\rangle\rangle$.

universal quantification inherent in the modal will not be vacuous. It states that for all closest worlds to the deontic ideal that are compatible with the premises in the context set and f_c, Alfonso is polite.

It is easy to see how the meaning of in "if"-clause with the COND feature interacts with a modal. The "if"-clause denotes a singleton set context shifter, that reduces the context set to worlds where the content of the adjunct is true. The main clause denotes a singleton set proposition. Since it combines with the conditional adjunct, it will be type-shifted and interpreted relative to the shifted context. The modal in the main clause will also therefore see only the shifted context, and take the assumptions in the "if"-clause into account.

3.2.4 Pointwise composition

In the case of an "if"-clause composing with its main clause, we have two singleton alternative sets. Consequently, though composition happens via pointwise function application (see §3.2.1), it is equivalent to composition via a regular FA operation in a non-Hamblinized grammar.

The situation with unconditionals is more complicated, because we do not have singleton sets. The pieces already given make the right prediction, though. Importantly, the conditional operator is not "alternative-aware": it is a normal singleton set denotation that does not manipulate or create alternatives in any way. So when it composes with an alternative set, it does so via pointwise FA. And when the result composes with the main clause it also does so via pointwise FA.

Let me briefly review the pointwise function application operation, since it governs composition of items that are not alternative-aware. The idea, again, is that an alternative set can compose with a singleton set by composing once for each alternative, and generating a new alternative set. See Alonso-Ovalle 2004, 2006, 2007 for a similar treatment of disjunction in "if"-clauses. The technical definition for pointwise FA is repeated from above:

(409) **(Hamblin) Pointwise Function Application (FA)** (Kratzer and Shimoyama 2002)
If α is a branching node with daughters β and γ, and $[\![\beta]\!]^{g,c} \subseteq D_\sigma$ and $[\![\gamma]\!]^{g,c} \subseteq D_{\langle\sigma\tau\rangle}$, then $[\![\alpha]\!]^{g,c} \underset{\text{def}}{=} \{a \in D_\tau \mid \exists b \exists c \left(b \in [\![\beta]\!]^{g,w,c} \wedge c \in [\![\gamma]\!]^{g,c} \wedge a = c(b)\right)\}$

What this means is that the conditional operator will apply pointwise to each alternative introduced in the unconditional adjunct. From each alternative we build a new alternative of a higher type, a sentence modifier. So:

(437) Example computation step 5: complete unconditional adjunct (with COND)
$[\![$[COND [**whether Alfonso dances with Joanna or Fruela**]]$]\!]^{g,c}$ =

$$\left\{ \begin{array}{l} \lambda p'_{\langle c\langle st\rangle\rangle}.\lambda w_s.\, p'(c + (\lambda w'_s.\text{A. dances with J. in } w'))(w), \\ \lambda p'_{\langle c\langle st\rangle\rangle}.\lambda w_s.\, p'(c + (\lambda w'_s.\text{A. dances with F. in } w'))(w) \end{array} \right\}$$

defined only if

(i) $\text{Exh}_{cs_c}(\left\{ \begin{array}{l} \lambda w_s\,.\text{A. dances with J. in } w, \\ \lambda w_s\,.\text{A. dances with F. in } w \end{array} \right\}) = 1$, and

(ii) $\text{MutExcl}_{cs_c}(\left\{ \begin{array}{l} \lambda w'_s\,.\text{A. dances with J. in } w', \\ \lambda w'_s\,.\text{A. dances with F. in } w' \end{array} \right\}) = 1$

The complete denotation of an unconditional adjunct is an alternative set of context shifting sentence operators.

The main clause is also not alternative-aware, and so this denotation (and the type-shift) will take the main clause as its argument in a pointwise way. The result is that the context will be shifted in different ways, once for each alternative. Effectively, this results in one conditional domain restriction for each alternative. To see how this works, suppose that we want to compose the denotation in (437) with the denotation of "Alfonso should be polite". The operation is shown schematically in figure 3.

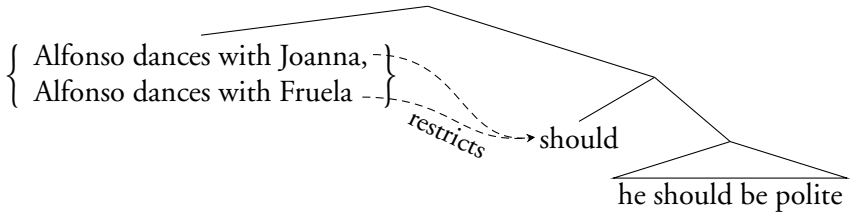


Figure 3: Pointwise domain restriction

The formal denotation for this consequent is repeated here from (436) in the previous section:

(436) Complete main clause (repeated from earlier)
$[\![[\textbf{should}\ [\textbf{Alfonso be polite}]]]\!]^{g,c}=$
$$\left\{ \lambda w \text{ s.t. } \underline{cs_c \cap \bigcap f_c(w) \neq \emptyset}\,. \left(\begin{array}{l} (\lambda w'\,.\text{Alfonso is polite in } w') \\ \qquad\qquad \text{is a human necessity in } w \\ \qquad\qquad \text{with respect to } (cs_c \cap \bigcap f_c(w)), \text{ and } g_c \end{array} \right) \right\}$$
defined only if f_c is a circumstantial c.b. and g_c is a deontic c.b.

Given the types, the main clause will be an argument to the conditional adjunct. What we have to do first is perform the type-shift to abstract over the context. Though the technical details of this type-shift may be unclear (see the appendix for a precise version), the idea should be clear. The type-shift will produce (for the at-issue content):

(438) Example composition step 6: type-shifted main clause
$$\left\{ \lambda c'_c\,.\lambda w \text{ s.t. } \underline{cs_{c'} \cap \bigcap f_{c'}(w) \neq \emptyset}\,. \left(\begin{array}{l} (\lambda w'\,.\text{Alfonso is polite in } w') \\ \qquad\qquad \text{is a human necessity in } w \\ \qquad\qquad \text{with respect to } (cs_{c'} \cap \bigcap f_{c'}(w)), \text{ and } g_{c'} \end{array} \right) \right\}$$

The context has been abstracted over, and all instances of c that would previously refer to the context of utterance have been replaced by the shifted context, c'. This is now an alternative set of type $\langle c\langle st\rangle\rangle$, the perfect argument for the conditional adjunct. Again, composition proceeds pointwise – this denotation is an argument once for each alternative. This gives (after various substitutions) the combined meaning in (439), with the internal presupposition once again underlined:

(439) Example composition step 7: combination of unconditional adjunct and main clause

Let p_0 be a shorthand for: $\lambda w''_s$.Alfonso is polite in w'', (the consequent)
p_1 be a shorthand for: $\lambda w''_s$.Alfonso dances with Joanna in w'' , (one alt.)
p_2 be a shorthand for: $\lambda w''_s$.Alfonso dances with Fruela in w'' (the other alt.)

Then:

$[\![$[**Cond** [**whether Alfonso dances with Joanna or Fruela**]], [**should** [**he be polite**]]$]\!]^{g,c}$

$$= \left\{ \begin{pmatrix} \lambda w \text{ s.t. } \underline{(cs_c \cap p_1) \cap \bigcap f_c(w) \neq \emptyset}. \\ \qquad\qquad p_0 \text{ is a human necessity in } w \text{ w.r.t. } ((cs_c \cap p_1) \cap \bigcap f_c) \text{ and } g_c \end{pmatrix}, \right.$$
$$\left. \begin{pmatrix} \lambda w \text{ s.t. } \underline{(cs_c \cap p_2) \cap \bigcap f_c(w) \neq \emptyset}. \\ \qquad\qquad p_0 \text{ is a human necessity in } w \text{ w.r.t. } ((cs_c \cap p_2) \cap \bigcap f_c) \text{ and } g_c \end{pmatrix} \right\}$$

defined only if

(i) $\text{Exh}_{cs_c}(\left\{ \begin{matrix} p_1, \\ p_2 \end{matrix} \right\}) = 1$

(ii) $\text{MutExcl}_{cs_c}(\left\{ \begin{matrix} p_1, \\ p_2 \end{matrix} \right\}) = 1$

(iii) f_c is a circumstantial c.b.

(iv) g_c is a deontic c.b.

The alternative set now contains two propositions that might be describe as conditional propositions. Each could well be the product of an individual "if"-conditionalization. Consequently this analysis directly realizes the intuition that alternative unconditionals can be paraphrased with a list of conditional claims (König 1986; Lin 1996). The denotation is not exactly the same as what we'd get with a sequence of conditional propositions, though; not only is the information packaged into one set of propositions, but we also end up with exhaustivity and mutual exclusivity presuppositions.[63]

The non-triviality presupposition is now clearly less trivial in its effect – since it too appears twice. What this guarantees is that the context set (as well as the circumstantial background) prior to utterance contains at least one world for each alternative. I return to this later.

It is easy to see how to simplify the exhaustivity and mutual exclusivity presuppositions given the alternative set in the above example. Exhaustivity will require every world in the context set to be one where Alfonso dances with Joanna, or he dances with Fruela. Mutual exclusivity will require that every world in the context set exist in exactly one of these alternatives and no more. Together, they lead to the presupposition that the discourse participants believe

[63]Of course, through pragmatic processes, we might end up with similar inferences with multiple "if"-conditionals.

Alfonso will dance with one or the other, and not both. This is exactly the effect we want to derive for an unconditional sentence.

Collecting alternatives The denotation of an unconditional sentence, up to this point, is not exactly complete; the reason is that it is a set of alternatives. In a Hamblin semantics, by default a root clause whose denotation is a set of alternatives is treated pragmatically as a question. It is clear empirically that an unconditional adjunct does not lead to a question interpretation for the clause that it appears in. There is a technical mismatch between this default assumption and the facts – what it takes for a sentence to be interpreted as a question is a root question operator. In a declarative unconditional there is no such operator, and so we should not predict a question interpretation. Therefore, to complete the analysis, something must happen to the alternatives.

In the compositional Hamblin semantics developed by Kratzer and Shimoyama 2002; Kratzer 2005b, items that introduce alternatives are associated with particular operators. Another way to think about this is that the alternatives themselves are associated with particular operators. In this case, the alternatives are associated with a question operator in the adjunct. Because the question operator compositionally serves to let alternatives through, at the current stage of composition there is no higher operator associated with the alternatives. However, because the root clause is not a question, we must do something with these alternatives. Menéndez-Benito 2006 (§3.7) has proposed that the default Hamblin operator in such cases is the universal operator. Menéndez-Benito's 2006 reasons for this proposal are for a fairly different case than the one under discussion here; they are to deal with Dayal-type examples (without generic aspect) such as (440):

(440) Cualquier estudiante podría haber estado aquí ayer.
Any student could have been here yesterday.

This is another case where, if no default operator stepped in, alternatives would be left uncollected (on Menéndez-Benito's 2006 analysis), leading to a spurious question interpretation.

The default operator is shown in (441):

(441) $[\![\forall \alpha]\!]^{g,c} \underset{\text{def}}{=} \{\lambda w . \forall p \in [\![\alpha]\!]^{g,c} : p(w) = 1\}$

This operator simply collects alternatives and claims that they are all true; it is the same kind of operator as the Hamblin existential operator presented earlier, but with different quantificational force. In the present case, it collects alternative conditionalized propositions, and asserts each of them to be true. This is exactly the kind of meaning we need in this position, to put together the set of conditionalized claims. To see how this works I will quickly sketch the results for the example that is being derived, and then return to the justification.

The denotation we end up with can be paraphrased as a conjunction of conditionals – "if Alfonso dances with Joanna he should be careful, and if he dances with Fruela he should be careful." Lin 1996 also discusses this kind of paraphrase of "wulun" ("no matter") conditionals

in Mandarin Chinese. This paraphrase does not of course capture the exhaustiveness presupposition, that Joanna and Fruela are the only possible dance partners made available in the context.

(442) Example composition step 8: complete unconditional sentence

Let p_0 be a shorthand for: $\lambda w'_s$. Alfonso is polite in w', (the consequent)
p_1 be a shorthand for: $\lambda w'_s$. Alfonso dances with Joanna in w', (one alt.)
p_2 be a shorthand for: $\lambda w'_s$. Alfonso dances with Fruela in w' (the other alt.)

Then:

$[\![$[Cond [**whether Alfonso dances with Joanna or Fruela**]], [**should** [**he be polite**]]$]\!]^{g,c} =$

$$\left\{ \lambda w''_s . \forall p \in \left\{ \begin{array}{l} \lambda w \text{ s.t. } \underline{(cs_c \cap p_1) \cap \bigcap f_c(w) \neq \emptyset}. \\ \qquad \left(\begin{array}{l} p_0 \text{ is a human necessity in } w' \\ \quad \text{w.r.t. } ((cs_c \cap p_1) \cap \bigcap f_c) \text{ and } g_c \end{array} \right), \\ \lambda w \text{ s.t. } \underline{(cs_c \cap p_2) \cap \bigcap f_c(w) \neq \emptyset}. \\ \qquad \left(\begin{array}{l} p_0 \text{ is a human necessity in } w \\ \quad \text{w.r.t. } ((cs_c \cap p_2) \cap \bigcap f_c) \text{ and } g_c \end{array} \right) \end{array} \right\} : p(w'') = 1 \right\}$$

defined only if

(i) $\text{Exh}_{cs_c}(\left\{ \begin{array}{l} p_1, \\ p_2 \end{array} \right\}) = 1$

(ii) $\text{MutExcl}_{cs_c}(\left\{ \begin{array}{l} p_1, \\ p_2 \end{array} \right\}) = 1$

(iii) f_c is a circumstantial c.b.

(iv) g_c is a deontic c.b.

Together, the conjunctive truth conditions with the distribution and exhaustiveness presuppositions make up the indifference implication. The choice of alternative does not matter, because none of the possible choices could change the truth of the modal statement.

The natural question is what happens when an unconditional appears adjoined to a root interrogative clause. The naive prediction, given the way I have presented the universal operator above, might be that the unconditional adjunct contributes to the question meaning (in the sense of contributing its alternatives to the set of possible answers). This is not what happens, and what does happen is complicated.

Unconditionals cannot be adjoined to most questions. There is quite a bit of difficulty in some of the following judgments, and it is not clear that everything is equally bad, but nearly all cases of such adjunction are somewhat marked. The judgment is quite sharp for left-adjoined unconditionals:

(443) # Whether the party is at Alfonso or Joanna's house, will it last a long time?

(444) # Whoever comes to the party, will it last a long time

(445) # No matter who comes to the party, will it last a long time?

(I have used a # because it is not clear that these are ungrammatical per se, but it is also not clear that they are infelicitous in the usual sense.)

Right-adjoined examples are better, but most are still not perfect, and speakers vary quite a bit in judging these. The one exception is that it does seem possible to right-adjoin some types of unconditionals to polar interrogatives:

(446) Will the party last a long time whoever comes to it?

(447) Will the party last a long time no matter who comes to it?

(448) ? Will the party last a long time whether it's at Alfonso or Joanna's house?

Note that a potential confound with respect to right-adjoined alternative unconditionals is that the intonational pattern of the adjunct isn't exactly compatible with the rise on the entire sentence. It does seem possible to pronounce this coherently, but it is a little tricky.

It is not generally good to right-adjoin an unconditional to other types of questions:

(449) ?? Who will Alfonso talk to whether he's in a bad mood or not?

(450) ?? Will Alfonso talk to his mother or his sister whether he's in a bad mood or not?

Some speakers judge similar sentences better when the gap or disjunction is in subject, not object position. However, I haven't found these judgments to be reliable and I will not make anything of them here. (An experimental study is called for.)

All of this data contrasts with "if"-conditionals, which are fine left or right adjoined to any type of interrogative clause (Isaacs and Rawlins 2008).

(451) If Alfonso comes to the party, will it last a long time?

(452) Will the party last a long time if Alfonso comes to it?

(453) If Alfonso comes to the party, who will he bring?

(454) Who will Alfonso bring to the party if he comes?

It is clear that more work needs to be done to disentangle the particular pattern found in unconditional questions; speakers are not really reliable enough to rely on anything short of experimental work here, and I have not done this. But the effects we see are strikingly like intervention effects. That is, the alternatives involved in the interpretation of the main clause question "clash" with the alternatives involved in the interpretation of the unconditional. This is what we'd expect if the main clause question operator required alternatives that were associated with it in some way. The possibility of unconditionals right-adjoining to polar questions further substantiates this. In chapter 2 I made a proposal for the semantics of polar questions in a compositional Hamblin semantics. The proposal (roughly following Karttunen's 1977a analysis) is that a polar question complementizer introduces its own alternatives, and then combines with them. That is, there is no compositional step between the introduction of polar alternatives and the combination with the operator they interact with, and so no place under the scope of the polar complementizer for intervention effects to take place. The fact that unconditionals can't left-adjoin to polar questions is unsurprising as this would lead to "interference" of the main clause' questioning alternatives, and the alternatives introduced by

the unconditional. I will leave for the future a formalization of this idea; it is not clear that any of the current ways of thinking about intervention effects and alternatives will do.

Let us return now to the issue of the universal operator. The naive prediction was that alternatives introduced in the adjunct would contribute to the alternative structure of the main clause question. In most cases, this simply does not happen, for (apparently) independent reasons – the two types of alternatives do not appear to be compatible. The one case that we can investigate is unconditionals right-adjoined to polar questions. When considering (455) earlier, I was considered simply with its acceptability, but now its meaning becomes interesting.

(455) Will the party last a long time no matter who comes to it?

The meaning can be probed with "yes" and "no" answers. These can be paraphrased with (456) and (457) respectively:

(456) The party will last a long time no matter who comes to it.

(457) The party will not last a long time no matter who comes to it.

Therefore, the unconditional scopes under the question operator, and its alternatives do not contribute to the polar question's alternative structure. On the analysis I have developed here, this must be because a Hamblin universal operator intervenes in the LF. This is exactly what we'd expect to happen on Menéndez-Benito's 2006 treatment of default ∀ operators: they are inserted up to interpretability. Assuming any mechanism for dealing with the intervention effects catalogued above, the sentence would simply not be interpretable if a universal operator were not inserted in the LF under the main-clause question operator. This scenario would lead to an intervention effect, with alternatives introduced in the unconditional adjunct reaching a question operator that they do not match.

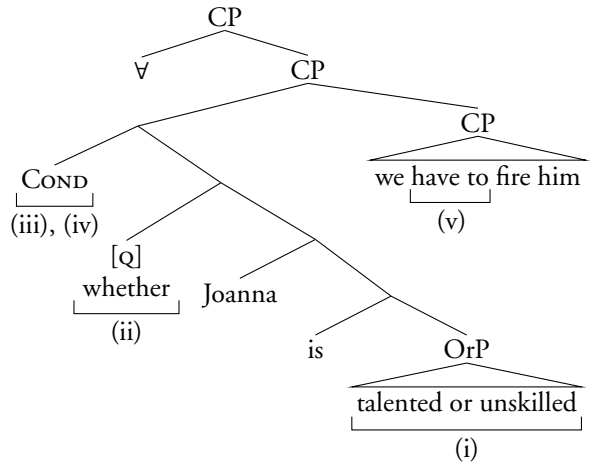
In summary, I follow Menéndez-Benito 2006 in taking the default operator in Hamblin semantics to be a universal operator, inserted up to interpretability. This is further motivated by an account of the apparent intervention effects in unconditional questions, and the possibility of right adjunction to polar questions. A full formalization of the unconditional question facts awaits future research, both in the empirical facts, and what would be needed to modify existing alternative semantics to account for such alternative-operator matching.

3.2.5 Summary

In the previous sections I have presented in detail a compositional analysis of unconditionals. The analysis has many parts. However, each part is simple and independently motivated. The interrogative morphology licenses the alternatives and provides the exhaustiveness presupposition. The interpretation of a conditional (which is general to any kind of conditional) puts the alternatives together with the modal; because composition is pointwise, this leads to the projection of a distribution presupposition.

The following diagram summarizes all of these parts.

(458) **Anatomy of an alternative unconditional**



(i) Disjunction introduces alternatives.

(ii) The question operator introduces an exhaustiveness presupposition.

(iii) A conditional adjunct (whatever its content) restricts the domain of a main clause modal.

(iv) Alternatives compose pointwise with the main clause via Hamblin pointwise function application – one modal claim for each alternative.

(v) The modal imposes an existence presupposition on its conversational background – leading to a distribution presupposition.

The next task is to extend the analysis to other kinds of unconditionals.

3.3 Extension to constituent and headed unconditionals

This analysis of disjunctive adjuncts can be straightforwardly extended to both constituent and headed unconditionals, for a large segment of the data. The main difference between the two constructions is the source of alternatives; the similarities are the interrogative morphology, the conditional meaning, and the main-clause operator. What we need to assume is that "wh-ever" items are indefinite pronouns in the sense of the Kratzer and Shimoyama Hamblin semantics. In this chapter I largely set aside the question of what "-ever" contributes, and return to it in chapter 4. There is a segment of data where the analysis I present in this chapter goes wrong, because we do not yet have a worked out theory of "-ever". I will turn to this data in the next chapter as well. This is data involving past non-episodic unconditionals, and to a lesser extent, episodic unconditionals. Here I will focus on data involving, roughly, future orientation.

Hamblin's semantics was of course originally intended to deal with "wh"-items, and it is no surprise that it is a natural fit here. A "wh"-item in a Hamblin semantics denotes an alternative set containing individuals: all the individuals that the item could possibly refer to. This contrasts with a name, for instance, which denotes a singleton set containing just the

individual that the name picks out. The alternative set composes in a pointwise way, and thus the alternative set percolates up the tree. The main difference from denotations of alternative interrogatives is simply that there are typically more alternatives introduced by a "wh-" item than by disjunction.

Some rudimentary denotations for "wh-ever" items are given below. (These will be revised in chapter 3, where I separate out the semantic effect of "-ever".)

(459) $[\![\textbf{whoever}]\!]^{g,c} \underset{\text{def}}{=} \{x_e : x \text{ is human}\}$

(460) $[\![\textbf{whatever}]\!]^{g,c} \underset{\text{def}}{=} \{x_e : x \text{ is non-human}\}$

An interrogative clause like "whatever Alfonso is good at" will then denote an alternative set of propositions, one proposition for any thing that Alfonso might be good at:

(461) $[\![[\textbf{whatever } [\textbf{Alfonso is good at } t]]]\!]^{g,c} =$

$$\left\{ \begin{array}{l} \lambda w_s\,.\,\text{Alfonso is good at chess in } w, \\ \lambda w_s\,.\,\text{Alfonso is good at web design in } w, \\ \lambda w_s\,.\,\text{Alfonso is good at placating management in } w, \\ . \\ . \\ . \end{array} \right\}$$

The compositional details needed to derive this are nearly straightforward. There is one wrinkle in how traces left by indefinite pronouns are interpreted; I suggest below that the alternative-introducing property of indefinite pronouns must "reconstruct" to the trace site so as to be in the scope of the Q operator. This turns out to be necessary to make the right predictions about the presuppositions of a question. Below I go through how this sentence would be interpreted in detail. Note that an important issue this theory doesn't settle by default is what the domain of the alternative set is – I argue in chapter 4 that "-ever"'s main effect is to mark that this domain is wide, and that even the most remote possibilities must be considered.

If a constituent interrogative clause appears as an adjunct (in combination with the COND operator), its alternative set denotation will act just as an alternative interrogative adjunct. In particular, the set will compose pointwise with the modal operator. Therefore, we will get the same distribution presupposition – but with many more instances. The presupposition will say that any of these alternatives is a possibility relative to the context set. This, in combination with the conjunctive interpretation of the final alternatives, derives the indifference implication for constituent unconditionals. The final interpretation of an example like "Whatever Alfonso's good at, we have to transfer him" could be paraphrased as "If he's good at chess we have to transfer him, and if he's good at web design we have to transfer him, and if he's good at placating management we have to transfer him, and so on..." The choice of alternative doesn't matter, because the main clause proposition will be necessary given any of these assumptions. We can't pick any skill of Alfonso's and get out of having to fire him. The pointwise interaction of an alternative interrogative adjunct and a modal main clause is illustrated schematically in figure 4.

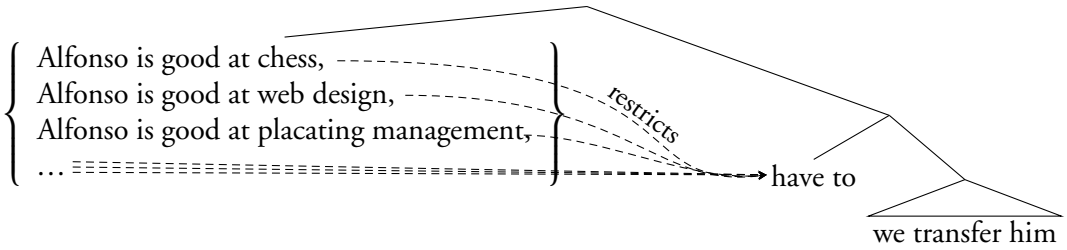


Figure 4: Pointwise domain restriction in constituent unconditionals

This analysis carries straightforwardly over to headed unconditionals as well. The missing piece is some assumption about what, if anything, "no matter" and "regardless of" contribute to the interpretation. One possibility is that they contribute nothing, beyond the consequences of syntactically selecting for an interrogative. This matches up with the theory that "if" is little more than a formal/morphological marker of "if"-conditionalization. Another (more plausible) possibility is that they contribute roughly the same meaning as "-ever". The reason to think this is that they are to some extent in complementary distribution:

(462) Whoever Alfonso talks to, he gets bad advice.

(463) No matter who Alfonso talks to, he gets bad advice.

(464) * No matter whoever Alfonso talks to, he gets bad advice.

For present purposes, since I am treating "-ever" as effectively vacuous, the meaning of "no matter" and "regardless" can be treated as vacuous in the same way. The one difference is that they do need to carry the COND feature, or have a lexical semantics that amounts to the same meaning. With these assumptions, composition of a headed unconditional proceeds nearly identically to composition of a constituent unconditional. The analysis of "-ever" that I give in chapter 4 can be applied to these items as well.

The scope-of-alternatives problem Working on the adjunct from the bottom up, the first interesting thing to consider is the trace. To interpret the trace, I will make an assumption that is different from the treatment of variables in Kratzer and Shimoyama 2002. They assume that a variable is interpreted as a singleton set containing the result of applying the index to the assignment function. Here is their pronoun denotation applied to traces:

(465) **Trace interpretation (K&S version; un-Hamblinized)**
$[\![t_i]\!]^{g,c} \underset{\text{def}}{=} \{g(i)\}$

Another way of thinking about this is that the assignment function has not been "Hamblinized" in any way – it maps indices to classical entities. The structure being interpreted here provides a complication. The trace is left by a "wh"-item, which I am taking to be an indefinite pronoun. In other words, it is an item whose denotation is not a singleton set. The question

is whether, using pointwise function application in combination with e.g. the theory of movement and traces in Heim and Kratzer 1998, this denotation for a trace can serve. The answer, unfortunately, is negative. The relative scope of the interrogative pronoun and the presupposition involved in the Q operator lead to a problem. (The at-issue content is in fact derived correctly.) This presupposition (exhaustivity & mutual exclusivity) is about the alternative set of the complement of Q. For the presupposition to be coherent, it needs to see the fully expanded alternative set resulting from the indefinite pronoun. A straightforward combination of the Hamblin semantics with a Heim and Kratzer semantics for variable binding predicts that the presupposition will be fully formed before the indefinite pronoun has expanded the alternative set. That is, the node headed by the lambda operator in a tree like the one in (472) has a denotation that will be a singleton set. It will be, simplifying: $\{\lambda x . \lambda w . x$ comes to the party in $w\}$. This denotation combines with the interrogative pronoun in its surface position via pointwise FA. Because we are combining a singleton set with the non-singleton set of humans, for each human there will be one alternative proposition for each person in this set coming to the party. This is the right alternative set, but it is generated too late. Because it is generated *after* the question operator, the presupposition for the question operator cannot see the full alternative set. Instead, it sees a singleton set of the form $\{\lambda w . g(2)$ comes to the party in $w\}$. We know that it has to be a singleton set because the K&S-style denotation for the trace guarantees that that node is a singleton set. Therefore we get a presupposition that this singleton alternative must exhaust the domain and exclude all alternatives – in other words, that it covers the entire context set. Because of pointwise FA, this presupposition will project once for each of the alternatives generated at the next stage of composition. The resulting set of presuppositions will never be jointly satisfiable, and won't be anything like what we want.

In general, we will find a problem with structures like $[\alpha_i$ ... $[\beta$ [... t_i ...]]], where α_i does not denote a singleton set, and β is a Hamblin operator that closes off the alternative set denoted by its sister in some way. Q does this as part of its presupposition, but many Hamblin operators do so as part of their at-issue contribution. For instance, if we moved an indeterminate pronoun over an existential operator and interpreted it at its surface position, the result would be a set of existential claims about singleton sets – taken jointly, a universal, not existential claim.

There are (at least) three possible solutions to this technical problem. One is to assume that the Q operator scopes over the LF position of the "wh"-items. I don't know of any empirical reason to assume this for English, especially given the assumption that Q is a feature in C.[64] The second approach would be to simply take "wh"-items to appear in their base position at LF. There are, of course, many problems with this to do with the scope of "wh"-items in examples that are more complicated than the ones I am addressing here, such as pair-list readings for multiple-"wh" questions. However, there are also many reasons to assume that some aspects of the interpretation of "wh"-phrases can reconstruct into the base position, so there is also something attractive about this second idea. The third solution, which I view as a semantic way of spelling out the reconstruction idea, is that the assignment function

[64] However, see Caponigro 2003 ch. 6, and Cable 2007.

contains Hamblinized semantic objects, not traditional semantic objects. That is, instead of transmitting each member of the alternative set pointwise down to the trace site via the assignment function, a "wh"-item transmits the whole alternative set. I will adopt the third solution here. It is not clear that any of these solutions are ideal; as this does seem to be a problem about reconstruction, ideally a solution would follow without stipulation from a general theory of reconstruction.

(466) **Reconstruction generalization**
Alternative-introducing items that A'-move reconstruct to their base positions for purposes of alternative introduction.

The technical implementation requires giving up the assumption that traces denote singleton sets of individuals. This assumption was, of course, simply a convenience for making compositions easier to write, since the composition operations assume nothing about the size of any set. We also most change the range of the assignment function:

(467) **Trace interpretation (Hamblinized)**:
$[\![\mathbf{t}_i]\!]^{g,c} \underset{\text{def}}{=} g(i)$

(468) **Assignment functions (Hamblinized)**:
An assignment function g is a function with the set of natural numbers as its domain, and $\mathscr{P}(D_e)$ as its range.

The implementation of the semantic reconstruction of alternatives also requires abstracting over alternative sets, rather than over individuals; this requires a more substantive technical revision that I will only make in the appendix. For present purposes I will use an intuitive, but not well-defined notation, where the lambda operator sits outside the alternative set:

(469) $\lambda X . \{\ldots X \ldots\}$

In general:

(470) **Lambda operator**
$[\![\lambda_i\ [\ \alpha\ ]]\!]^{g,c} \underset{\text{def}}{=} \lambda X . [\![\alpha]\!]^{g/i \to X, c}$

This kind of abstraction is specifically defined so that if X introduces alternatives, the alternatives are introduced any time $g(i)$ is invoked.[65] It will work for DPs that denote singleton set as well – here the behavior reduces to the normal behavior.

[65] This actually leads to problems that I will not deal with here, in cases where a "wh"-pronoun binds a pronoun:

(i) Which$_3$ student t_3 dislikes his$_3$ TA?

The unfortunate prediction here is a lack of co-reference. This prediction is not made by the more standard implementation I am rejecting, nor by the approach that scopes the Q operator over the interrogative pronoun. However, I think that this problem is an instance of a more general problem:

(ii) Who$_3$ were you just meeting with? I think he$_4$ left his notebook here.

In the remainder of this section I will illustrate the composition of a constituent unconditional with an example. This section could be skipped without loss of profit; but it does go through all the details.

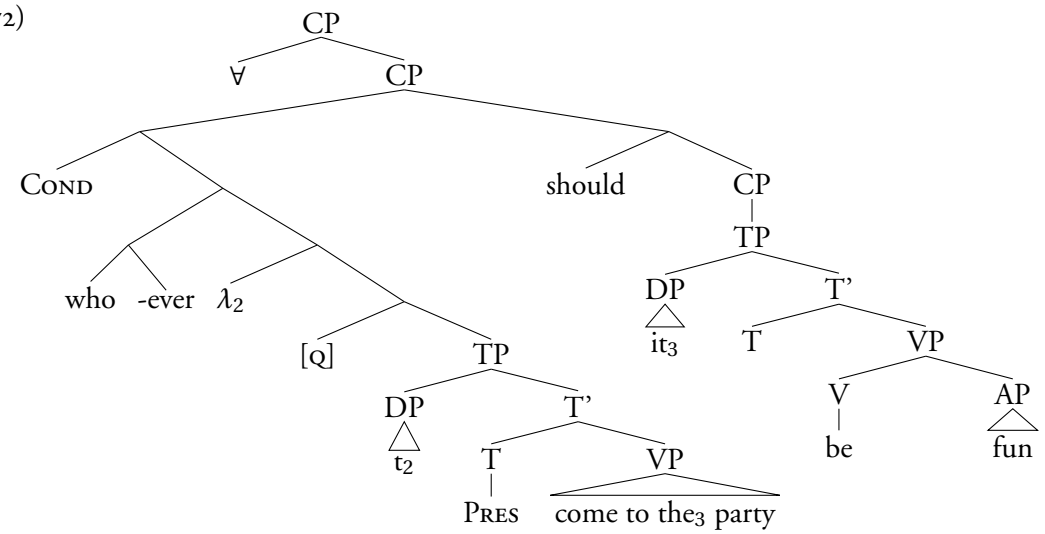
3.3.1 Example composition of a constituent unconditional

In this section I will go through the composition of a prototypical constituent unconditional:

(471) Whoever comes to the party, it should be fun.

The LF I will be assuming for this sentence is shown in (472).

(472)



I take this instance of "should" to be a straightforward circumstantial necessity modal. Therefore, its denotation differs from previous instances only in how it is parameterized:

(473) Example composition step 1: main clause modal
$[\![\textbf{should}]\!]^{g,c} =_{\text{def}}$
$\left\{ \lambda p_{\langle st \rangle} . \lambda w \text{ s.t. } \underline{cs_c \cap \bigcap f_c(w) \neq \emptyset} . \right.$
$\left. \qquad\qquad\qquad\qquad\qquad\qquad p \text{ is a human necessity in } w \text{ with respect to } (cs_c \cap \bigcap f_c(w)), \text{ and } g_c \right\}$
defined only if f_c is an epistemic conversational background and g_c is a circumstantial conversational background.

Here the pronoun should be anteceded in discourse by the alternative set denotation of "who", and we might not expect co-reference except in terms of the entire set. But what happens is that "he" has something like an E-type meaning: "the student you were just meeting with." In general it seems that when considering discourse segments with pronouns anteceded by an alternative set in any configuration, we make sure that whatever member of the alternative set is being considered in the pointwise we, that member is also used for the pronoun's referent. I will leave this problem without a technical solution here.

In all the closest worlds (ordered by how well they match the contextually determined circumstances) compatible with what we know, the proposition p must be true. This denotation, of course, does not capture the future orientation of this instance of "should", which would state that the proposition must come true in the future. I abstract away from this issue here.

The sister of "should" has a straightforward denotation:

(474) Example composition step 2: main clause
$[\![\textbf{it}_3\ \textbf{be fun}]\!]^{g,c} = \{\lambda w_s\,.\,g(3) \text{ is fun in } (w)\}$

Putting the two together gives us:

(475) Example composition step 3: complete main clause
$[\![\textbf{should}\ [\textbf{it}_3\ \textbf{be fun}]]\!]^{g,c} =$

$$\left\{ \lambda w \text{ s.t. } \underline{cs_c \cap \bigcap f_c(w) \neq \emptyset}\,. \quad \begin{array}{l} (\lambda w'_s\,.\,g(3) \text{ is fun in } w') \\ \text{is a human necessity in } w \\ \text{with respect to } (cs_c \cap \bigcap f_c(w)), \text{ and } g_c \end{array} \right\}$$

defined only if f_c is an epistemic conversational background and g_c is a circumstantial conversational background.

In other words, it must be true, given the circumstances, that the party is fun. The circumstances here will be constrained by the unconditional adjunct, so I proceed to that next.

I will start with the denotation of the trace. Recall that I have adopted a non-standard way of interpreting traces, sketched above – they may denote alternative sets. A consequence is that we can't be sure until we get to the binder of the trace whether the trace denotes a singleton or non-singleton set. We must therefore assume the more general description of pointwise FA, rather than the simple case of singleton sets, until we find out. The trace will denote a Hamblin object of type e – a set of individuals. Therefore, we get a denotation for the TP containing the trace as follows:

(476) Example composition step 4: adjunct TP
$[\![t_2\ \textbf{come to the}_3\ \textbf{party}]\!]^{g,c} = \{p_{\langle st\rangle} \mid \exists x_e \in g(2) : p = \lambda w_s\,.\,x \text{ comes to } g(3) \text{ in } w\}$
defined only if $g(3)$ is a singleton set containing the unique salient party.

I have glossed over the definite description, which isn't important here. This denotation is an alternative set containing all the propositions that correspond to someone in $g(2)$ coming to the unique party. If it were to turn out that $g(2)$ is a singleton, this would just give as a singleton set. (This isn't what will happen in the present example, of course.

In combination with the Q operator, we get the same alternative set and add in a presupposition about it:

(477) Example composition step 5: adjunct C'
$[\![\textbf{Q}\ [t_2\ \textbf{come to the}_3\ \textbf{party}]]\!]^{g,c} = \{p_{\langle st\rangle} \mid \exists x_e \in g(2) : p = \lambda w_s\,.\,x \text{ comes to } g(3) \text{ in } w\}$
defined (for g, c) only if

(i) $\text{Exh}_{cs_c}\left(\{p_{\langle st\rangle} \mid \exists x_e \in g(2) : p = \lambda w_s\,.\,x \text{ comes to } g(3) \text{ in } w\}\right) = 1$
(ii) $\text{MutExcl}_{cs_c}(\{p_{\langle st\rangle} \mid \exists x_e \in g(2) : p = \lambda w'_s\,.\,x \text{ comes to } g(3) \text{ in } w'\}) = 1$
(iii) $g(3)$ is a singleton set containing the unique salient party.

The next step is lambda abstraction. Here, as with the context-abstraction type-shift, we run into a difficulty of representation. The problem is that if lambda abstraction is really to take a complete alternative set as an argument and abstract over it (the solution I adopt for the scope mismatch problem discussed above), it really needs to be a Hamblin operator. That is, it must be "outside" the Hamblin system in a way, like the other Hamblin operators. Therefore, in the K&S system, there is no easy way to represent it compositionally. Again, the tools in the appendix provide a formalism for doing this; here we will just have to ignore the odd aspect of the denotation below. The idea, at any rate, is that the denotation of the phrase with the lambda operator as the highest daughter takes an alternative set of individuals, and gives back an alternative set of propositions. We can intuitively represent this by placing the lambda operator outside the alternative set. (In the notation of the appendix, this constituent would be of type $\boxed{\boxed{et}\boxed{\langle st\rangle t}}$, and composes with regular function application, not pointwise FA. I have used X as a variable over Hamblin sets for present purposes.)

(478) $[\![\lambda_2\ [\ \textsc{q}\ [t_2$ **comes to the**$_3$ **party** $]]]\!]^{g,c} = \lambda X\,.\,[\![[\ \textsc{q}\ [t_2$ **comes to the**$_3$ **party**$]]\!]^{g/2\to X,c}$
defined for X, g, c only if $[\![[\ \textsc{q}\ [t_2$ **comes to the**$_3$ **party**$]]\!]^{g/2\to X,c}$ is defined.

Substituting, this gives us:

(479) Example composition step 6: abstracted C'
$[\![\lambda_2\ [\textsc{q}\ [t_2$ **come to the**$_3$ **party**$]]]\!]^{g,c} =$
$\lambda X\,.\,\{p_{\langle st\rangle} \mid \exists x_e \in X : p = \lambda w_s\,.\,x \text{ comes to } g(3) \text{ in } w\}$
defined (for g, c) only if
(i) $\text{Exh}_{cs_c}\left(\{p_{\langle st\rangle} \mid \exists x_e \in X : p = \lambda w_s\,.\,x \text{ comes to } g(3) \text{ in } w\}\right) = 1$
(ii) $\text{MutExcl}_{cs_c}(\{p_{\langle st\rangle} \mid \exists x_e \in X : p = \lambda w'_s\,.\,x \text{ comes to } g(3) \text{ in } w'\}) = 1$
(iii) $g(3)$ is a singleton set containing the unique salient party.

The denotation of "whoever" is the set of people (see the next chapter for more on this):

(480) Example composition step 7: "wh-ever" pronoun
$[\![\textbf{whoever}]\!]^{g,c} = \{x \mid x \text{ is human}\}$

This gets substituted in for X in the above formula:

(481) Example composition step 8: adjunct CP
$[\![\textbf{whoever}\ \lambda_2\ [\ \textsc{q}\ [t_2$ **comes to the**$_3$ **party**$]]]\!]^{g,c} =$
$\{p_{\langle st\rangle} \mid \exists x_e \in \{x \mid x \text{ is human}\} : p = \lambda w_s\,.\,x \text{ comes to } g(3) \text{ in } w\}$
defined (for g, c) only if
(i) $\text{Exh}_{cs_c}\left(\{p_{\langle st\rangle} \mid \exists x_e \in \{x \mid x \text{ is human}\} : p = \lambda w_s\,.\,x \text{ comes to } g(3) \text{ in } w\}\right) = 1$
(ii) $\text{MutExcl}_{cs_c}(\{p_{\langle st\rangle} \mid \exists x_e \in \{x \mid x \text{ is human}\} : p = \lambda w'_s\,.\,x \text{ comes to } g(3) \text{ in } w'\}) = 1$
(iii) $g(3)$ is a singleton set containing the unique salient party.

The at-issue content is the set of propositions of people coming to the party, one for every person. The presupposition is that for every world in the contextually specified domain, one of these party-attending propositions makes that world true. That is, the domain f_c (at the index world) exhausts the alternative set. I have left unrepresented here the possibility that the denotation of "whoever" might be contextually constrained itself. This is certainly a possibility, and one I will discuss when I turn to the meaning of "ever".

The next steps proceed exactly like the interpretation of an alternative unconditional. The Cond operator introduces abstraction over contexts:

(482) Example composition step 9: full unconditional adjunct (CP with Cond)
$[\![$**Cond [whoever** λ_2 [**Q** [t_2 **come to the**$_3$ **party**]]]$]\!]^{g,c}=$

$$\left\{ A \in D_{\langle\langle c\langle st\rangle\rangle\langle st\rangle\rangle} \;\middle|\; \exists x'_e \in \{x \mid x \text{ is human}\} : \exists p_{\langle st\rangle} : \left(\begin{array}{ll} & p = \lambda w_s \,.\, x \text{ comes to } g(3) \text{ in } w \\ \wedge & A = \lambda p'_{\langle c\langle st\rangle\rangle} \,.\, \lambda w'_s \,.\, p'(c+p)(w') \end{array} \right) \right\}$$

defined (for g, c) only if

(i) $\text{Exh}_{cs_c}\left(\{p_{\langle st\rangle} \mid \exists x_e \in \{x \mid x \text{ is human}\} : p = \lambda w_s \,.\, x \text{ comes to } g(3) \text{ in } w\}\right) = 1$
(ii) $\text{MutExcl}_{cs_c}(\{p_{\langle st\rangle} \mid \exists x_e \in \{x \mid x \text{ is human}\} : p = \lambda w'_s \,.\, x \text{ comes to } g(3) \text{ in } w'\}) = 1$
(iii) $g(3)$ is a singleton set containing the unique salient party.

Though hard to read, the alternative set here is exactly the same kind of alternative set seen with the alternative unconditional in (437). The difference in readability comes from the fact that here, we cannot easily write out the list of alternatives. The idea is the same – we have an alternative set of context shifters, each of which puts a proposition about some particular person attending the party into the conversational background that is used as the domain of the main clause operator.

In the formula above, the main clause denotation gets plugged in for p' by pointwise function application. The main clause denotation is repeated here from (475) above

(483) Example composition step 3 (repeated): complete main clause
$[\![$**should [it**$_3$ **be fun**]$]\!]^{g,c}=$

$$\left\{ \lambda w \text{ s.t. } \underline{cs_c \cap \bigcap f_c(w) \neq \emptyset} \,. \begin{array}{r} (\lambda w'_s \,.\, g(3) \text{ is fun in } w') \\ \text{is a human necessity in } w \\ \text{with respect to } (cs_c \cap \bigcap f_c(w)), \text{ and } g_c \end{array} \right\}$$

defined only if f_c is an epistemic conversational background and g_c is a circumstantial conversational background.

This singleton set composes (following abstraction over the context parameter) with the unconditional adjunct. The result is a set of propositions:

(484) Example composition step 10: full unconditional (before $\forall$)
Let $p_{\text{consequent}}$ stand for

$$\lambda w \text{ s.t. } \underline{cs_c \cap \bigcap f_c(w) \neq \emptyset} \,. \left(\begin{array}{r} (\lambda w'_s \,.\, g(3) \text{ is fun in } w') \text{ is a human necessity in } w \\ \text{with respect to } (cs_c \cap \bigcap f_c(w)), \text{ and } g_c \end{array} \right)$$

Then,
$[\![$[**Cond [whoever** λ_2 [**Q** [t_2 **come to the**$_3$ **party**]]]], [**should [it**$_3$ **be fun**]]$]\!]^{g,c}=$

$$\left\{ p \in D_{\langle st \rangle} \;\middle|\; \exists x'_e \in \{x \mid x \text{ is human}\} : \exists p'_{\langle st \rangle} : \left(\begin{array}{ll} & p' = \lambda w_s \,.\, x \text{ comes to } g(3) \text{ in } w \\ \wedge & p = p_{\text{consequent}} \end{array} \right) \right\}$$

defined (for g, c) only if

(i) $\text{Exh}_{cs_c}\left(\{p_{\langle st \rangle} \mid \exists x_e \in \{x \mid x \text{ is human}\} : p = \lambda w_s \,.\, x \text{ comes to } g(3) \text{ in } w\}\right) = 1$

(ii) $\text{MutExcl}_{cs_c}(\{p_{\langle st \rangle} \mid \exists x_e \in \{x \mid x \text{ is human}\} : p = \lambda w'_s \,.\, x \text{ comes to } g(3) \text{ in } w'\}) = 1$

(iii) $g(3)$ is a singleton set containing the unique salient party.

This is an alternative set of conditional propositions involving a necessity modal. There is one such proposition for every person in the (extensional) domain, telling us that, if that person comes to the party, it should be fun. Each of these propositions presupposes that the set of worlds in the domain of quantification is non-empty, i.e. that it is possible (perhaps quite remotely) that that person comes to the party.[66]

Finally, we collect all of these propositions together with the ∀ operator. I won't illustrate this here, since the result is straightforward: a singleton set of type ⟨st⟩, containing the proposition that conjoins all of the propositions in the denotation in (484).

3.3.2 Summary

Constituent and headed unconditionals, so far, have turned out to involve a simple extension to the semantics for alternative unconditionals. Two additional assumptions were necessary: (i) that "wh-ever" phrases denote alternative sets of individuals (following Hamblin), and (ii) that alternative-introducing elements reconstruct to their base position for purposes of introducing alternatives. This second assumption I implemented by revising the way the assignment function is integrated with Hamblin semantics.

Where constituent and headed unconditionals become less simple is in non-episodic examples involving present or past, with concrete times, and with episodic examples.

(485) Last year, whoever Alfonso dated, he had a bad time.

(486) Whoever Alfonso is talking to (over there), she is getting mad.

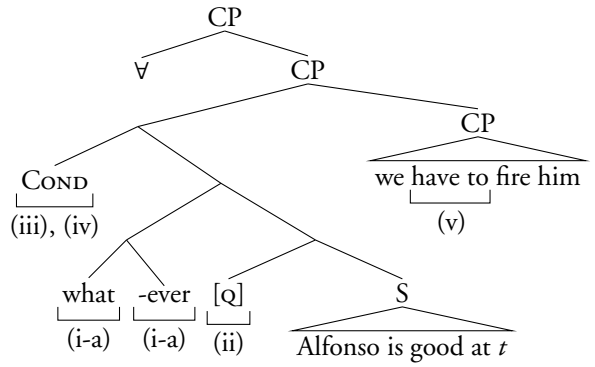
In the first example, we learn that for every person that Alfonso dated last year, he had a bad time. In the second, we learn that the speaker does not know who Alfonso is talking to. The semantics I have developed in this chapter does not yet account for these examples. The puzzle they raise is this: what constrains the alternative set introduced by the antecedent? In each case, the alternative set produced by the semantics so far is too wide. It includes one proposition for every person in the domain. In the first example, we want to constrain this to people who Alfonso did date. (However, such examples do sometimes give rise to counterfactual inferences about even people he didn't date.) In the second, we want to constrain this to people who Alfonso could be talking to. I will set aside these puzzles for the moment, and return to them

[66] Here I treat the domain of individuals as a set of atoms, for purposes of simplification. Obviously, unconditionals can also quantify over plural individuals, and any algebraic theory of plurality (cf. Link 1983) could be overlaid on the domains picked out by "wh"-pronouns.

in the next chapter. The explanation will come from a combination of tense, the contribution of "-ever", and the domain of quantification used by "wh"-words.

The following diagram summarizes the parts of a constituent unconditional:

(487) **Anatomy of a constituent unconditional**



(i) a. The "wh-item" introduces alternatives.
b. "-ever" widens the alternative set (see ch. 4)

(ii) The question operator introduces an exhaustiveness presupposition.

(iii) A conditional adjunct (whatever its content) restricts the domain of a main clause modal.

(iv) Alternatives compose pointwise with the main clause via Hamblin pointwise function application – one modal claim for each alternative.

(v) The modal imposes an existence presupposition on its conversational background – leading to a distribution presupposition.

I won't give a diagram for headed unconditionals but it would look quite similar. The overall conclusion is that constituent unconditionals work exactly like alternative unconditionals; the difference is in how the alternatives are introduced.

3.4 Results and consequences

3.4.1 The problem of compositionality and conditional structure

One of my major criticisms of previous analyses is that to greater or lesser degrees they are not fully compositional. That is, many previous analyses have given a procedure to translate unconditionals into a logical language that does not decompose the parts. Zaefferer 1990 does not decompose anything, and simply assigns translations to English conditional sentences of various types (into different types of infons). Gawron 2001 decomposes the internal structure of unconditional antecedents, but the way in which the unconditional composes with the main clause is stipulated in a construction-specific rule. Consequently, neither of these analyses make

any linguistic connection between unconditionals and "if"-conditionals. It is accident that the two have such closely related interpretations. (For Zaefferer 1990, it is even an accident that different kinds of unconditionals have closely related interpretations.)

The analysis I have given here is completely compositional. Following Gawron 2001, the decomposition of the unconditional antecedent is based on a semantics for questions. Unlike Gawron 2001, I have treated unconditional adjuncts as interrogative clauses (based on the evidence in chapter 2) and used a very uniform semantics for questions. It is the use of pointwise function application that enables this.

The ways in which unconditionals and "if"-conditionals are interpreted, modulo the use of pointwise function application, is exactly the same. Each serves to provide domain restrictions to operators in its scope.

The one assumption that has enabled this is that conditional adjuncts are formally marked with a semantic function in a way that is independent of particular morphology such as the word "if". I argued in chapter 2 that this is necessitated in a very general way by a large class of conditional-like adjuncts that are not consistently marked. Here, this marking takes the form of a feature [cond], which introduces the domain-restriction semantics. Some analogous marking would be necessitated on any compositional semantics of conditionals that hopes to account for the full range of conditional-like structures introduced in chapter 2. For instance, on an account where conditionals are treated as a kind of correlative structure (Geis 1985; Iatridou 1991; von Fintel 1994; Schlenker 2004; Bhatt and Pancheva 2006), we would need to assume some way of marking which clausal adjuncts are correlatives and which are not. I explore this assumption in much more detail in chapter 4; I argue there that for many reasons it is unavoidable, as well as desirable.

The complete decomposition of meaning involved in the analysis developed in this chapter is the main improvement on previous analyses of unconditionals. I now turn to some distinctions between the two kinds of conditionals.

3.4.2 Unconditionals, *if*-conditionals, and iffiness

In chapter 1 I highlighted two key differences between unconditionals and "if"-clause conditionals. These were that unconditionals always entail their consequent, and that unconditionals always carry an indifference implication. The analysis developed in this chapter explains both of these phenomena. The indifference implication is the main effect of the analysis – that all ways of conditionalizing the consequent lead to the same conclusion.

Consequent entailment follows basically for the same reason. An "if"-clause condition typically does not entail its consequent because the domain of the modal is restricted to some subset of the possibilities – some temporary premise is introduced into the modal reasoning. The same is true in unconditionals, but multiple premises are considered. In fact every premise that could be true is considered, and the modalized proposition is found to follow from any of these. Therefore, the consequent is guaranteed to be true. This reasoning is basically the same

reasoning that allows us to conclude from "if p, q" and "if not p, q" that "q".[67] Consequent entailment is effectively a side-effect of the indifference implication.

A key observation about the analysis presented here is that the mechanism for conditionalization is identical between unconditionals and "if"-clause conditionals. Though I have implemented this using the mechanism of context shifting, the details don't matter – it would be identical if we had a conditional adjunct bind a domain variable, or if we had it move into the restrictor of the operator. The differences follow entirely from the internals of the conditional adjunct. The exhaustive set of alternatives leads to a meaning not found with an "if"-clause conditional.

"If"-clause conditionals are occasionally described as being characteristically "iffy." (This way of putting things goes back at least to Austin 1956b.) However, the notion of iffiness is difficult to pin down in a precise way, especially in versions of the LKH theory that attribute no meaning whatsoever to the word "if" (see e.g. von Fintel 1994; von Fintel and Iatridou 2002; Gillies 2007 for discussion). Even without a firm notion iffiness, the intuitive concept leads to the question of whether unconditionals are iffy in any sense. It also leads to the idea of using unconditionals as a probe for exploring iffiness. Any characteristics specific to "if"-conditionals might be what should really be referred to as iffiness, and properties general to all kinds of conditionals absorbed into general properties of the LKH theory (or any theory of conditionalization).

Unconditionals do share some properties with "if"-clause conditionals. They both involve temporarily introducing new premises – i.e. assuming or supposing that some proposition or propositions are true for a short discourse span, and exploring what follows from the premises. With an "if"-clause conditional, we temporarily assume the antecedent, and see whether the consequent follows from that. This property is roughly what Gillies calls "shiftiness", and it is most noticeable in dynamic accounts of conditionals (see Isaacs and Rawlins (to appear) for discussion). In the LKH theory this is implemented by taking the antecedent to restrict the domains of following operators. The same temporary assumption of premises is involved in an unconditional – the difference is now that the premises are exhaustive.

A further distinction noted earlier is that "if"-clause conditionals are different from unconditionals in that they resist exhaustiveness (there is an "anti-exhaustiveness" effect). So an example like (402), repeated from earlier, is infelicitous.

(402) # If Alfonso goes to the party or doesn't go to the party, he will be bored.

This distinction does not follow from my analysis – since it does not follow from the LKH theory of conditionals. What does of course follow is that unconditionals involve an exhaustive set of domain restrictions, but nothing prevents an "if"-clause from also exhausting the domain. We might expect it to be pragmatically odd to use an exhaustive restriction in an "if"-clause, since the function of an "if"-clause conditional is to *restrict* a domain, and an exhaustive proposition doesn't do any restriction (cf. the domain expansion problem discussed

[67] Of course, unlike the classical reasoning this parallel suggests my analysis does not rely on the law of the excluded middle, in that the presuppositions involved in the unconditional construction will force the worlds to be arranged so that this law holds, even if it isn't guaranteed in all cases.

below). However, if it is accepted that unconditionals are conditionals, this explanation might seem odd – they characteristically provide exhaustive restrictions. There are two possible ways of explaining this; I don't currently know of any empirical ways of deciding between them.

The first way rests on the observation that, on my analysis, no single restriction is exhaustive. In aggregate we see exhaustiveness, but not alternative by alternative. So unconditionals would not trigger any prohibition against exhaustive domain restriction. This explanation requires us to assume that disjunction in an "if"-clause does not work like disjunction in an unconditional. In particular, it would have to be classical, and the Hamblin existential operator would obligatorily appear within the clause. This makes perfect sense, since disjunction in unconditionals is licensed by the question operator, not by an existential operator, and there is no such question operator in an "if"-clause. However, this leads to difficulties if we wish to adopt recent analyses of disjunctive antecedents of "if"-conditionals. In particular, it is not compatible with the analysis of Alonso-Ovalle 2006, 2007. (See below for discussion of further incompatibilities with this analysis.)

The second explanation for the oddness of (402) involves pragmatic blocking. An unconditional has an exhaustiveness presupposition, and therefore is specifically designed to perform the function of exhaustive domain restriction. An "if"-clause, however, introduces no such presupposition. As a conditional adjunct with a more specific purpose, we would therefore expect a similar "whether"-unconditional to block an "if"-clause with exhaustive disjunction. This analysis would also lead to capturing the intuitively natural idea that "if"-clauses are the least marked kind of conditional in English.

Regardless of the explanation, the distinction in exhaustiveness seems to be the main "if"-conditional vs. unconditional distinction. In this respect the analysis developed here follows Zaefferer 1990; the difference is that I have provided an explanation of the source of the exhaustiveness presupposition.

3.4.3 Orthogonality

Lewis 1988 defines a notion of orthogonality for "subject matters". A subject matter, for Lewis, is an equivalence relation on possible worlds, or a partition of those worlds:

> Two subject matters M_1 and M_2 are orthogonal iff, roughly, any way for M_1 to be is compatible with any way for M_2 to be. If we think of subject matters as equivalence relations, orthogonality means that for any worlds w and v there is a world u such that $M_1(u, w)$ and $M_2(u, v)$. If we think of subject matters as partitions, orthogonality means that M_1 and M_2 cut across each other: each cell of M_2 intersects each cell of M_2.

One interpretation Lewis suggests for the notion of a subject matter is as a question. In the terms I have used here, what this really means is that an issue is a kind of subject matter. Intuitively, we might expect unconditionals to make a statement that one issue is orthogonal to another. It can be shown that they do; this is one way of thinking about what the indifference implication amounts to. The question is what exactly the issues involved are.

Because I have imposed exhaustiveness and mutual exclusivity on the alternative set denoted by the unconditional adjunct, it is straightforward to think of this alternative set as a partition or equivalence relation, relative to the domain of these presuppositions. Call this alternative set of propositions Q, and the corresponding equivalence relation Q_e. The domain of this relation will be the context set cs_c.

It is a little less straightforward to see what issue is derived from the main clause. I consider here only the special case where the main clause contains a necessity modal; that is the clause has the form $\Box p$. First, take the issue corresponding to just this proposition p – that is, the equivalence relation over the set of worlds in that proposition that is completely connected. As a subject matter this is very uninteresting, because it settles the subject matter entirely, but it is still can be thought of as a valid sort of subject matter (or issue).[68]

Now the question is what is the domain with which we must examine these two issues. That we must address orthogonality relative to a domain can be seen by the fact that all of the conditions that allow us to map the alternative set to an equivalence relation are only true relative to a restricted domain. The exhaustiveness and mutual exclusivity presuppositions are relative to the context set, cs_c. The domain over which the modal claim is calculated is the context set intersected with the modal base at some world, intersected with the proposition from the antecedent we are currently looking at. For each domain restriction (proposition in Q), we check the truth of p at all closest worlds in that restriction. For each of these propositions given by Q, the modal $\Box$ guarantees that there will be worlds in that intersection that make p true.

All told we will examine the part of the modal base that intersects with cs_c. Relative to this set, an unconditional sentence entails that the two issues defined above will be orthogonal to each other. That is, the proposition in the scope of the necessity modal completely cross-cuts the alternatives in the antecedent, relative to this intersection. Since we have guaranteed that both issues are partitions relative to the entire context set, not just the context set intersected with the modal base, we know that they will cross-cut each other relative to the entire context set as well.

Since an unconditional sentence entails its consequent, following its assertion, the alternatives will cross-cut a more interesting issue. That is, since we know that the negation of the consequent proposition p is false (not just that the domain is artificially small), the alternatives are orthogonal (in discourse) to the issue of "whether" p, not just the proposition "that" p. That is, they trivially cross-cut the negative alternative as well as the positive alternative.

3.4.4 Unconditionals vs. plain sentences

When distinguishing unconditionals and plain modal sentences, the indifference implication is again the key. A plain modal sentence, even uttered against the right background, never has any kind of explicit indifference implication. The difference results in large part from the

[68] Lewis in fact bans this kind of subject matter as trivial, but this ban is for somewhat different purposes (the formalization of relevant logic).

distribution presupposition – that all the alternatives are a possibility. The crucial contrast is repeated from earlier:

(488) Whether Alfonso dances with Joanna or Fruela, he will make a fool of himself.

(489) Alfonso is going to dance with someone, and it's either Joanna or Fruela. He will make a fool of himself.

In (488) there is an explicit linguistic presupposition that either Joanna or Fruela is a possible dance partner. This is what I have referred to as the distribution presupposition – alternatives are distributed over the possibility space. In the last sentence of (489) there is no such presupposition, though presumably in this context the speaker takes this for granted. This accounts in for the intuition that the two utterances convey different things. The speaker in (489) does not explicitly guarantee any kind of distribution of alternatives, whereas the one in (488) does.

Another place where the interpretations potentially differ is in the domains of quantification. In the unconditional, the modal "will" is restricted twice, once with the assumption that Joanna is the partner, and once with the assumption that Fruela is the partner. There is only one domain restriction in the plain modal sentence, and it is provided entirely by context. On the most straightforward way of filling in these domain restrictions from context, we might expect the end result to be completely identical. However, domain restriction is well known to be a vague process, and given the context sensitivity it would be entirely unsurprising if the vagueness were resolved in completely different ways depending on the domain. There is no reason to expect that the domain restriction for "will" in the plain modal sentence is identical to the union of the two domain restrictions involved in the unconditional. Intuitively, when we specifically advance the premise of e.g. Joanna being the dancer, we seem to inevitably bring in premises about Joanna that might well be ignored when interpreting the plain modal sentence.

Earlier I noted that a negated unconditional (using e.g. "it is not true that") negates the indifference implication, and not the consequent. This follows straightforwardly from my analysis.

(490) Let p_0 be a shorthand for: $\lambda w''_s$.Alfonso is polite in w'', (the consequent)
p_1 be a shorthand for: $\lambda w''_s$.Alfonso dances with Joanna in w'', (one alt.)
p_2 be a shorthand for: $\lambda w''_s$.Alfonso dances with Fruela in w'' (the other alt.)

Then:

$[\![$[**it's not true that** [$\forall$[**Cond** [**whether Alfonso dances with Joanna or Fruela**]], [**should** [**he be polite**]]]]$]\!]^{g,c}$ =

$$\left\{ \lambda w'''_s . \neg \forall p \in \left\{ \begin{pmatrix} \lambda w' \text{ s.t. } \underline{(cs_c \cap p_1) \cap \bigcap f_c(w') \neq \emptyset .} \\ p_0 \text{ is a human necessity in } w' \\ \text{w.r.t. } ((cs_c \cap p_1) \cap \bigcap f_c) \text{ and } g_c \end{pmatrix}, \begin{pmatrix} \lambda w' \text{ s.t. } \underline{(cs_c \cap p_2) \cap \bigcap f_c(w') \neq \emptyset .} \\ p_0 \text{ is a human necessity in } w' \\ \text{w.r.t. } ((cs_c \cap p_2) \cap \bigcap f_c) \text{ and } g_c \end{pmatrix} \right\} : p(w''') = 1 \right\}$$

(further presuppositions omitted)

Negation takes scope over the entire unconditional clause, including the ∀ operator. The negated universal is still compatible with some of the alternatives being true, and requires that at least one alternative not be true (e.g. ¬∀ = ∃¬). This negates the claim that every single alternative leads to the consequent being true, and therefore negates the indifference implication. As we want, the distribution presupposition will project, as will the other presuppositions that I have left off here.

3.4.5 Unconditionals in discourse

In chapter 1, I introduced a peculiar property of unconditionals in discourse. Unlike "if"-conditionals or plain modal sentences, they can be used by a speaker to avoid taking a stance on an issue, even if a conversational partner has just taken some stance on the issue. Here is the example from earlier:

(491) A: Alfonso is really great at his job.
B: Whether or not he's great at his job, we have to fire him.

The explanation for this behavior, and the distinctions from "if"-conditionals and plain modal sentences follow straightforwardly. Speaker B's utterance, among other things, presupposes that it is possible that Alfonso is great at his job, and that it is possible that he is not. In other words, the utterance presupposes that it is completely unsettled whether Alfonso is great at his job. Further, the main point of the sentence is to say that the obligation to fire him is completely independent of how he is at his job. Both of these factors are significant in understanding this discourse effect.

The presupposition is in part in direct contradiction with A's claim – the possibility of the negative alternative contradicts the claim that Alfonso is great at his job. By itself, this wouldn't quite have the desired effect, though it might be enough to begin an argument between A and B. The main point of B's utterance, however, addresses what we must assume is the real point of the discourse – to figure out whether to fire Alfonso. The information structure of an unconditional suggests that resolving the issue mentioned in the antecedent is subsidiary to the point in the consequent, and at the same time, makes no attempt to resolve it.[69] It is the presupposition in combination with the effect of the (entailed) consequent in advancing the larger goals of the discourse that leads to speaker B avoiding taking any stance on A's claim.

A plain modal sentence, while it might similarly advance the goals of the discourse, lacks this presupposition. Therefore, by default it will result in speaker B accepting A's claim, in a discourse like the following:

(492) A: Alfonso is really great at his job.
B: We have to fire him.

[69] It is an interesting project, which I have not yet undertaken, to see how the subsidiary nature of the unconditional's antecedent can be formally captured.

An "if"-conditional might also move the discourse forward, in the same way that an unconditional does. However, it also lacks the distribution/exhaustiveness presuppositions. This results in two possible scenarios. The first is what Zaefferer 1991 calls a modus-ponens conditional and Iatridou 1991 calls a factual conditional, where the antecedent is taken for granted:

(493) A: Alfonso is really great at his job.
B: If he's great at his job, we can't fire him.

In this case, the meaning of the conditional itself leads to B accepting A's claim, at least temporarily. (I do not propose to explain the behavior of modus-ponens conditionals here.)

The other scenario, where the "if"-clause denies the claim, is infelicitous:

(494) A: Alfonso is really great at his job.
B: # If he's not great at his job, we can fire him.

Unlike a parallel unconditional, speaker B's utterance doesn't explicitly leave open the possibility of A's claim being true. It involves temporarily assuming only the opposite of what A claimed, without counterfactual morphology. (Note that a counterfactual/subjunctive, as we might expect, would be fine in place of B's response; e.g. "If he were great at his job, we could fire him.") The unconditional example does have us temporarily assume that A is wrong, but also temporarily assumes that A is right. Thus an unconditional takes no stance at all, whereas a negative "if"-conditional suggests (not as the main point of the sentence) that the most likely situation is that A's claim is wrong.

The analysis of unconditionals I have developed here satisfies all of the empirical goals outlined in chapter 1 and reviewed in §3.1. Furthermore, it does it in a completely compositional way, and involves linguistic (not just truth-conditional) connection between "if"-conditionals and unconditionals.

3.4.6 The domain expansion problem

In chapter 1, I introduced the domain expansion problem. This was, simply put, that many ways of combining unconditionals and a semantics for conditionalization lead to triviality. A disjunctive and exhaustive conditional antecedent, on these semantics, leads to a vacuous conditional claim. The problem was noticed and exploited by Klinedinst 2004, but I argued that one of the premises of exploitation (that the indifference implication is a conversational implicature) is not correct.

The present analysis avoids this triviality by a combination of pointwise domain restriction, and the distribution presupposition. An unconditional claim is not trivially equivalent to the meaning of the plain consequent, since the meaning of the plain consequent does not ensure that the alternatives involved in the unconditional are all non-trivial relative to the modal's domain. That is, the plain consequent would not involve any particular alternatives being distributed throughout the modal space, whereas the unconditional does. The role of pointwise domain restriction (caused by Hamblin pointwise function application) is to ensure

that the antecedent of an unconditional is not treated as a homogeneous proposition. Each alternative matters to the compositional system, all the way through composition.

3.5 Counterfactual unconditionals

In this section I discuss some issues in the licensing of counterfactual unconditionals, which turns out to be less simple than the licensing of counterfactual "if"-conditionals. I also return to the problem of disjunctive antecedents, introduced in chapter 1.

3.5.1 Licensing counterfactuals

Gawron 2001 notes that there can be counterfactual unconditionals; I have repeated his example in (495). The situation is not quite so simple as noting that they exist, however. In my judgment and in the judgment of speakers that I have consulted, counterfactual unconditionals are odd/infelicitous when they attempt to start a counterfactual discourse segment.[70]

(495) # Whatever John had chosen, Mary would have been pleased with it.

This is a difference from "if"-conditionals, which are routinely used to being a counterfactual discourse segment in a previously non-counterfactual context.

(496) If John had chosen a sweater, Mary would have been pleased with it.

This observation about their infelicity out of context extends to the full range of counterfactual unconditionals; the following are all odd without the right context:

(497) # Whether Alfonso had gone to Harvard or to Princeton, he would have become a banker.

(498) # No matter where Alfonso had gone to school, he would have become a banker.

Counterfactual unconditionals can be acceptable with appropriate context.

(499) (Suppose Alfonso didn't end up going to Bard, and Harvard or Princeton was his other choice.)
Whether he had gone to Harvard or to Princeton, he would have become a banker.

(500) (Suppose John was trying to buy Mary a birthday gift, and couldn't decide between various choices – his indecision made him give up.) Whatever John had chosen, Mary would have been pleased with it.

Such unconditionals can also be licensed by explicitly using a counterfactual supposition or "if"-conditional to begin the discourse segment.

[70] Note that this is different than saying they are infelicitous out of the blue. This is probably true also, but it is true quite generally of conditionals.

(501) If Alfonso hadn't gone to Bard, whether he had gone to Harvard or to Princeton, he would have become a banker.

(502) Suppose Alfonso hadn't gone to Bard. Whether he had gone to Harvard or Princeton, he would have become a banker.

The generalization is that counterfactual unconditionals are more picky than counterfactual "if"-conditionals. They require some discourse context where it is very explicit or salient what the counterfactual "choice point" is. In practice, this will often happen with "if"-conditionals, but it is typically easier to infer. That is, it is very difficult to use an unconditional to take the initial step of pushing aside what actually happened. This is a new empirical observation that an analysis of unconditionals needs to explain, especially one that likens them to "if"-conditionals.

This data has a straightforward explanation based on the analysis I have given. The explanation follows from the treatment of exhaustiveness. The exhaustiveness presupposition states that the alternatives introduced in the antecedent exhaust the contextually determined possibility space. In the case of a counterfactual unconditional, this possibility space must consist of counterfactual possibilities, in order to satisfy the implication of counterfactuality (I remain neutral here on whether it is a presupposition or not). But in a typical context, where what actually happened is highly salient, the exhaustiveness presupposition will lead to one alternative corresponding to what actually happened, and the rest corresponding to counterfactual possibilities. This mixed alternative set will conflict with the counterfactuality implication. Without some highly salient way of determining what, exactly, the exhaustive counterfactual possibilities are, the unconditional will be odd. Providing a highly explicit context, or explicitly excluding the factual possibility, will get around this. "If"-conditionals, which lack (and resist) exhaustiveness, do not lead to the potential of a conflict between it and counterfactuality.

More technically, we must make some assumptions about the details of exhaustiveness and counterfactuals to get this explanation to come out. The domain involved in exhaustiveness must be the same domain that is widened in the first place in a counterfactual when considering the counter-to-fact possibilities. The further narrowing of this domain to consider only a specific counter-to-fact possibility is a property of the interaction of an "if"-clause and the operator it restricts. That is, it will happen on a case by case basis for multiple domain restrictions. Finally, we must assume that the counterfactual implication is a presupposition, not an implicature. Otherwise, we would expect exhaustiveness to triumph, and the counterfactual implication to be canceled.

3.5.2 The disjunctive antecedent problem

The problem of disjunctive antecedents in counterfactuals (see chapter 1 for more detailed presentation) involves sentences like (503) (from Alonso-Ovalle 2007):

(503) If we had had good weather this summer or the sun had grown cold, we would have had a bumper crop.

The problem, intuitively, is that one of the possibilities in the antecedent is much less likely than the other. We want to predict that the above sentence is not true, because if the sun had grown cold, there probably wouldn't have been any crops at all. However, a minimal change semantics for counterfactuals that involves looking at the "closest" worlds tends to predict sentences like this to be true. The reason is that when considering such worlds we will automatically exclude the less likely alternative, because it will be false at all of the closest worlds, leading to triviality of the (classical) disjunction as long as the other disjunct is true at all of them. That is, unbalanced likelihoods and classical disjunction lead to the less likely disjunct(s) not playing any role in the computed truth-conditions. Though it is easiest to see the problem with extreme differences in likelihood, it is also probably that very subtle differences in likelihood would lead to the same results on a minimal change semantics. The problem arises as long as all the worlds in one proposition are not as close (by the relevant measure) as the closest worlds in the other proposition. If we do not make the Limit assumption, the generalization becomes more complex, but the idea is still the same. As long as (in Lewis' terminology) the antecedent-permitting spheres where the consequent is true at all worlds make only one disjunct true, the problem arises. We must be sure to examine some true worlds for each antecedent (Nute 1975).

As discussed in chapter 1, this problem potentially arises with counterfactual unconditionals, except that because of the presence of disjunction or a "wh-ever" item, it would appear in any counterfactual unconditional. Suppose that the actual state of affairs involved bad weather, and we are discussing what would have happened if that weren't the case.

(504) (Suppose we didn't have that bad weather this summer.) Whether we had had good weather or the sun had grown cold, we would have had a bumper crop.

An account that treats disjunction here as classical would run into the same problem. For example, Gawron 2001 extended with a minimal change semantics – though disjunction there is not exactly classical it is close enough.

Alonso-Ovalle 2004, 2006, 2007 proposes a solution that relies an a non-classical disjunction. Specifically, for Alonso-Ovalle 2006, 2007 this is the Hamblin semantics that I have been assuming here. The idea is that the alternatives introduced by disjunction are not collected within the "if"-clause, but escape that clause and interact with the main-clause modal in a pointwise way. In exactly the same way as I have proposed for unconditionals, "if"-conditionals for Alonso-Ovalle involve multiple pointwise domain restrictions. This forces us to consider each disjunct separately, and avoids the problem of disjunctive antecedents.

Because my analysis of unconditionals shares so much with Alonso-Ovalle; Alonso-Ovalle's 2006; 2007 analysis of disjunctive counterfactuals (it was developed based on Alonso-Ovalle 2004), it avoids the most straightforward instantiations of the problem of disjunctive antecedents. Each alternative effectively forms a separate counterfactual proposition, and therefore closeness will be separately evaluated for each alternative. Unlikely alternatives will not be spuriously discounted. There are two questions raised: how general this solution truly is, and whether the Hamblin analysis of unconditionals reflects on the Hamblin approach to disjunctive antecedents in general.

Accepting this solution for counterfactual unconditionals does not require accepting a similar solution for "if"-conditionals; nothing about my analysis predicts that alternatives would compositionally escape an "if"-clause. In fact, my analysis in the context of unconditionals suggests the opposite. The reason, for an unconditional, that the alternatives are not collected internally to the "if"-clause is that the question operator is designed to let them through. There is no clear reason why alternatives introduced in a disjunction inside an "if"-clause adjunct, which does not act interrogatively, would escape the clause. Of course, there is much we do not know about the compositional behavior of alternatives, so as an objection to the Hamblin account of disjunctive antecedents, this is weak by itself.

In the next section I discuss a number of more empirical problems.

Complications Given the application of such an analysis to unconditionals, there are in fact several reasons to think that the Hamblin solution to the disjunctive antecedent problem is not the right one.

If the Hamblin solution to the antecedent disjunction problem is accepted for unconditionals but not other conditionals, we would of course need a different solution for those other conditionals. We would also need that solution for constituent unconditionals that contain a disjunction, since this disjunction behaves classically, in the sense that its scope is limited to the antecedent. However, exactly because this instance of disjunction appears to behave classically, there is reason to think that the Hamblin approach cannot apply to it.

(505) Whoever had talked to Alfonso or Joanna, they wouldn't have gotten anywhere.

From this example we can see that the disjunction on top of the constituent unconditional structure does not add to the indifference implication in any way. That is, a Hamblin treatment of disjunction in counterfactual antecedents would predict (505) to mean something like (506), supposing that Alfonso and Joanna are the only HR managers. However, it means something closer to (507).

(506) No matter who had talked to which HR manager, they wouldn't have gotten anywhere.

(507) No matter who had talked to one of the HR managers, they wouldn't have gotten anywhere.

The difference is somewhat hard to paraphrase, but it seems to amount to being explicit about what doesn't matter. In the multiple "wh" example, the choice of HR manager explicitly doesn't matter, but in (505) and (507), it at best implicitly doesn't matter. This suggests that the proper treatment of balancing disjunctions in counterfactual antecedents is purely pragmatic, not situated at the pragmatics-semantics interface. For instance, Klinedinst 2007 provides a conversational implicature-based account of this problem.

There are further problems. In §3.2.4 I discussed the fact that left-adjoined unconditionals are generally bad, and argued that this is the result of an intervention-type effect. The

alternatives involved in the main-clause question "clash" with the alternatives that escape the unconditional.

(508) # Whether or not Alfonso comes to the party, will Joanna have fun?

If this is the right explanation, a similar Hamblin approach to disjunction in "if"-clauses predicts that they also should not be good left-adjoined to a question just in case there is disjunction in the antecedent. However, this is not the case, and counterfactuals are even possible (Isaacs and Rawlins 2008).

(509) If Alfonso or Henry comes to the party, will Joanna have fun?

(510) If Alfonso or Henry had come to the party, would Joanna have had fun?

This asymmetry suggests that the scope of the disjunction is local enough that it cannot interfere with the main-clause question operator, i.e. it is local to the "if"-clause. Note that Alonso-Ovalle 2004, 2006, 2007 assumes that the alternatives introduced by disjunction are directly captured by a modal. However, this would leave us without any explanation for the intervention effects seen with unconditionals.

A further point involves (rare) languages where an unconditional can be formed using a plain conditional structure. Using a conditional structure is common, but it is usually marked in some special way, e.g. by the equivalent of "even". As mentioned earlier this is not possible in English, but is possible in Spanish (Haspelmath and König 1998).

(511) Si llueve o sale el sol, saldremos
if rains or go.out the sun, we:will:go.out
'Whether it rains or the sun shines, we will go outside.

The point is that this kind of language explicitly allows the expression of indifference with a regular conditional construction. In English "if"-conditionals we do not get the same sense of indifference. Therefore, if the Hamblin-analysis of the indifference implication is right, i.e. that it involves exhaustive non-trivial alternatives, then we would predict indifference readings across the board with disjunctive conditionals in any language. This is something we simply do not find.

In summary, unconditionals come built-in with a solution to the primary instances of the problem of disjunctive antecedents. I have suggested, however, that this solution is not general enough for unconditionals (e.g. there are secondary instances of the problem when a constituent unconditional contains a disjunction), and that the Hamblin analysis of unconditionals raises conceptual and empirical problems for a general application of such an analysis to "if"-conditionals as a solution to the problem of disjunctive antecedents. I conclude that a pragmatic solution, along the lines of Klinedinst 2007, is called for in the primary instances of the disjunctive antecedent problem for "if"-conditionals, and the secondary instances for unconditionals.

3.6 Conclusion

This chapter has provided a compositional account of the meaning of an unconditional. The account has two key parts: that unconditionals are a species of conditional, and that unconditionals involve interrogative syntax. That they are a species of conditional means that they should be interpreted like "if"-clauses in the Lewis/Kratzer/Heim tradition – as devices for restricting the domains of operators. That they are interrogatives means that their meaning will be closely related to the meanings of other interrogative clauses. That is, in Hamblin's terms, they denote alternative sets. Because of the way alternative sets interact with the rest of the grammar in a compositional Hamblin semantics, these alternatives grow out of the conditional adjunct they start in, and interact with the main clause. This leads to the indifference implication – the claim that the choice of alternative doesn't matter.

There are several issues that I have not dealt with in this chapter. For the compositional semantics, the most pressing issue is what "-ever", "no matter", and "regardless" contribute to the meaning of an unconditional. I turn to this in the next chapter, arguing that these items mark intensional domain widening. I have ignored an entire class of unconditionals, those involving bare disjunction. I leave these for future work; see also Rawlins 2006; Pullum and Rawlins 2007.

I have presented the treatment of unconditionals as conditionals in a straightforward way, motivating it empirically in the previous chapter, and in this chapter implementing a simple and relatively standard semantics for LKH-theory conditionals. However, I believe it is a significant result that the semantics I have given for conditionals is completely uniform with respect to unconditional adjuncts and "if"-clause adjuncts. It is not at all a priori obvious that this should even be possible. This result is the culmination of a long line of analyses that liken unconditionals to conditionals, especially Gawron 2001, but it is the first analysis to my knowledge that makes their compositional semantics completely uniform. The key piece of the analysis that makes this possible is the alternative semantics for unconditional adjuncts.

This result suggests that the LKH theory of conditionals should not be limited to "if"-clause conditionals. It invites us to wonder what other adjuncts could be treated as LKH conditionals in a uniform way. Perhaps the class is quite large, and perhaps there are even less obvious members than unconditionals.

3-A Hamblin semantics, compositionally

One of the properties of the Hamblin semantics developed in Kratzer and Shimoyama 2002 (K&S) is that most of the definitions of quantifiers/operators are given syncategorematically, and therefore not compositionally. This is because alternatives are modeled using sets, and everything else with functions. We could model alternatives with functions as well – Karttunen 1977a does this – but the alternative/non-alternative distinction needs to be maintained somehow. For Karttunen this is not an issue, as the use of Hamblin semantics in that analysis of questions effectively does not extend inside the clause. It simply builds off of clauses (cf. the

Proto-Question Rule). The K&S system of course does extend inside the clause, and so the distinction between alternative sets and items whose traditional denotations are characteristic functions must be maintained. In K&S, the set/function distinction can be thought of as a tool for maintaining this distinction. The reason that this distinction must be maintained is that composition operators must not act on sets that aren't to be alternatives. For example, if set-talk and function-talk were conflated, an alternative set of individuals would be indistinguishable from a one-place predicate, which has the type of a characteristic set of individuals. Whether or not this scenario might arise in practice, it is at least something that we want to prevent in principle. One place where a confusion of this kind might arise is in predicative copular sentences: we want to ensure e.g. that "Alfonso is a doctor" and "*Alfonso is any doctor" are semantically distinct[71] An obvious idea presents itself: find some way to mark alternative types as distinct from regular types. This is effectively the analysis I develop here.

An important consequence of using the set/function distinction in this way is that operators which deal directly with alternatives can't be stated in the standard lambda calculus. This is because the lambda calculus doesn't represent alternatives at all – the alternatives are in a way "outside" the lambda calculus. Therefore, the definitions are most easily written syncategorematically. There are also clear pedagogical reasons for presenting the system in this way; it is much simpler to state the denotations of operators, and denotations in general are much more readable (this will be seen below). However, it is desirable to have a truly compositional implementation of a Hamblin semantics, and to understand how a standard Montagovian semantics like that of e.g. Heim and Kratzer 1998 has been "Hamblinized" in Kratzer and Shimoyama 2002. This appendix provides a compositional treatment of alternative-aware operators, and discusses Hamblinization.

The basic technique I use is providing a second lambda operator, and extending the type hierarchy – one lambda operator will be limited to alternative types, and one to regular types. If we have an alternative lambda operator and a regular lambda operator, we don't need to keep the parallel between the set/function distinction and the alternative/non-alternative distinction. We can use the alternative lambda operator to state the denotations of alternative-aware operators in a compositional way. Effectively, the type system will be subdivided by a diacritic marking alternatives. I now sketch what the system would have to look like in detail.

The first piece is to extend the type hierarchy, and define alternative-aware lambda operators.

(512) **Types**

a. The basic types are e, s, and t.

b. If σ is a type and τ is a type, then so are both $\langle\sigma\tau\rangle$ and $\boxed{\sigma\tau}$.

c. Nothing else is a type.

[71] Of course, FC "any" in English might not be a FC determiner in the Hamblin semantics sense, or it might have an additional meaning component to differentiate it from predicative indefinites. A similar problem would arise in languages such as German which do have FC determiners of this kind, and so more exploration is needed here.

(513) **Lambda Operators**

a. An expression of the form $\lambda x \in D_\sigma . \phi$, where ϕ has the type τ, is of type $\langle \sigma \tau \rangle$

b. An expression of the form $\boxed{\lambda} x \in D_\sigma . \phi$, where ϕ has the type τ, is of type $\boxed{\sigma \tau}$

λ reduction (and $\boxed{\lambda}$ reduction) work the same way as always - I won't define it here but it can be done straightforwardly, given some fixing of the formal language the lambda operators are embedded in. The box types are alternative types, and the angle-bracket types are regular types. Note that $\langle \sigma \tau \rangle$ and $\boxed{\sigma \tau}$ are *not* equivalent, and a type mismatch would arise if a function wanted one and got the other. This is how the difference between alternative and non-alternative types is captured – a predicate would be a an angle-bracket type ($\langle$et$\rangle$), and a set of individual alternatives would be a box type ($\boxed{et}$); the two could never be mistaken compositionally.

K&S only use box types that happen to be characteristic functions of sets, but in principle higher box types are possible. In fact it is not always so easy to see what box types that are not built from basic alternative sets would be used for, and so this could be seen as a flaw of the present system. For instance, is there ever any need for $\boxed{se}$?

What follows are K&S operators translated into pure function talk. For each operator, in (a) I give the K&S version, and in (b) I give the pure function version. At this point it might not be clear why I have made the denotations of these operators boxed types; this will become clear shortly.

(514) **Propositional existential operator**

a. (Non-compositional version from K&S)
$[\![\exists \alpha]\!]^{g,c} \underset{\text{def}}{=} \{\lambda w \in D_s . \exists r [r \in [\![\alpha]\!]^{g,c} \wedge r(w) = 1]\}$

b. (Compositional version)
$[\![\exists]\!]^{g,c} \underset{\text{def}}{=} \boxed{\lambda} p \in D_{\boxed{\langle st \rangle t}} . \boxed{\lambda} q \in D_{\langle st \rangle} . q = (\lambda w \in D_s . \exists r \in D_{\langle st \rangle} [p(r) = 1 \wedge r(w) = 1])$

(type $\boxed{\boxed{\langle st \rangle t} \boxed{\langle st \rangle t}}$)

(515) **Propositional universal operator**

a. (Non-compositional version from K&S)
$[\![\forall \alpha]\!]^{g,c} \underset{\text{def}}{=} \{\lambda w \in D_s . \forall r [r \in [\![\alpha]\!]^{g,c} \rightarrow r(w) = 1]\}$

b. (Compositional version)
$[\![\forall]\!]^{g,c} \underset{\text{def}}{=} \boxed{\lambda} p \in D_{\boxed{\langle st \rangle t}} . \boxed{\lambda} q \in D_{\langle st \rangle} .$
$q = (\lambda w \in D_s . \forall r \in D_{\langle st \rangle} [p(r) = 1 \rightarrow r(w) = 1])$

(516) **Existential generalized quantifier**

a. (Non-compositional version from K&S)
$[\![\exists \alpha]\!]^{g,c} = \{\lambda P \in D_{\langle e \langle st \rangle \rangle} . \lambda w \in D_s . \exists a [a \in [\![\alpha]\!]^{g,c} \wedge P(a)(w) = 1]\}$

b. (Compositional version)

$$[\![\exists]\!]^{g,c} = \boxed{\lambda}\, P \in D_{\boxed{et}} .\ \boxed{\lambda}\, P' \in D_{\langle\langle e\langle st\rangle\rangle\langle st\rangle\rangle} .$$
$$P' = \left(\lambda Q \in D_{\langle e\langle st\rangle\rangle} .\, \lambda w \in D_s .\, \exists a \in D_e [P(a) = 1 \wedge Q(a)(w) = 1]\right)$$
$$\text{(type } \boxed{et}\ \boxed{\langle\langle e\langle st\rangle\rangle\langle st\rangle\rangle t}\text{)}$$

(517) **Universal generalized quantifier**

a. (Non-compositional version from K&S)
$[\![\forall\alpha]\!]^{g,c} = \{\lambda P \in D_{\langle e\langle st\rangle\rangle} .\, \lambda w \in D_s .\, \forall a[a \in [\![\alpha]\!]^{g,c} \rightarrow P(a)(w) = 1]\}$

b. (Compositional version)
$[\![\forall]\!]^{g,c} = \boxed{\lambda}\, P \in D_{\boxed{et}} .\ \boxed{\lambda}\, P' \in D_{\langle\langle e\langle st\rangle\rangle\langle st\rangle\rangle} .$
$$P' = \left(\lambda Q \in D_{\langle e\langle st\rangle\rangle} .\, \lambda w \in D_s .\, \forall a \in D_e [P(a) = 1 \rightarrow Q(a)(w) = 1]\right)$$

The translations are straightforward – it is simply a matter of translating set-talk to function-talk, and using the new type hierarchy.

Function application also needs to be modified. Here is the K&S pointwise function application:

(518) **Mixed set/function version of Hamblin FA** (from K&S)
If α is a branching node with daughters β and γ, and $[\![\beta]\!]^{g,c} \subseteq D_\sigma$ and $[\![\gamma]\!]^{g,c} \subseteq D_{\langle\sigma\tau\rangle}$, then $[\![\alpha]\!]^{g,c} \underset{\text{def}}{=} \{a \in D_\tau \mid \exists b \exists c[b \in [\![\beta]\!]^{w,g} \wedge c \in [\![\gamma]\!]^{g,c} \wedge a = c(b)]\}$

The modifications to this are straightforward; again it is a matter of translating set-talk to function talk. The new version (given below) will work by hiding the alternative type hierarchy from denotations that are not alternative-aware. It is convenient to first define this pointwise composition as a meta-language operation. Where parenthesis correspond to direct function application in the metalanguage, I will use × to represent meta-language function application of the pointwise kind.

(519) **Pure function versions of Hamblin FA**

a. **Meta-language pointwise function application**
If X is an element of type $\boxed{\sigma t}$, and Y is an element of type $\boxed{\langle\sigma\tau\rangle t}$, then
$X \times Y \underset{\text{def}}{=} \boxed{\lambda}\, a \in D_\tau .\, \exists b \exists c[X(b) \wedge Y(c) \wedge a = c(b)]$

b. **Object-language pointwise function application**
If α is a branching node with daughters β and γ, and $[\![\beta]\!]^{g,c} \in D_{\boxed{\sigma t}}$ and $[\![\gamma]\!]^{g,c} \in D_{\boxed{\langle\sigma\tau\rangle t}}$, then $[\![\alpha]\!]^{g,c} \underset{\text{def}}{=} [\![\beta]\!]^{g,c} \times [\![\gamma]\!]^{g,c}$

When an alternative-aware operator (or lexical item) composes with its sister, it is clearly not pointwise FA that is applying. In fact, it seems to be something analogous to a standard direct function application operation. So in a pure-function system, we seem to need two kinds of function application - pointwise, and direct. Direct function application looks a lot like the standard Montagovian FA, except that it only works for alternative functions.

(520) **Direct function application**
If α is a branching node with daughters β and γ, and $[\![\beta]\!]^{g,c} \in D_{\boxed{\sigma\tau}}$ and $[\![\gamma]\!]^{g,c} \in D_{\sigma}$, then $[\![\alpha]\!]^{g,c} \underset{\text{def}}{=} [\![\beta]\!]^{g,c}([\![\gamma]\!]^{g,c})$

How is it decided which rule to use when composing which constituents? The type system leads to a strict division of labor. If the types involve alternative sets whose contents can be combined, Pointwise Function Application applies. If the types involve box types that can be combined directly, Direct FA applies. Just as in the mixed function/set version of Hamblin semantics every denotation is a set, here every denotation is a boxed type at at least the outermost level. Plain angle-bracket types are never seen except when contained inside some boxed type.

Consequently, one way of construing the box/angle type distinction is as a marker of which compositional rule to use. That is, a lexical item stipulates either that it composes by direct or pointwise FA, and it stipulates this by having one type or the other. This kind of lexical property is familiar from Chung and Ladusaw 2004, though the composition operation involved is different. Chung and Ladusaw introduce a new composition operation Restrict, that augments the familiar saturation operation involved in direct function application. They argue that in some languages, indefinites can be specified for whether they compose via Restrict or via FA. It is easy to see that one way to represent this kind of lexical constraint formally is with a diacritic on the item's type, exactly the kind of diacritic I have used here for other purposes. One difference here is that I do not take direct FA to be the default; it is pointwise FA that is the default.

Regular denotations of lexical items can be Hamblinized straightforwardly in this system. A predicate like $[\![\textbf{good}]\!]^{g,w,c}$ would normally denote something like:

$$\lambda w_s . \lambda x_e . x \text{ is good in } w$$

In K&S it would denote:

$$\{P_{\langle s\langle et\rangle\rangle} : P = \lambda w_s . \lambda x_e . x \text{ is good in } w\}$$

In this appendix it would denote:

$$\boxed{\lambda} P_{\langle s\langle et\rangle\rangle} . P = \lambda w_s . \lambda x_e . x \text{ is good in } w.$$

In general the K&S system Hamblinizes a predicate by turning it into a singleton set containing that predicate. The double-lambda system turns a predicate into a box-type function that characterizes that predicate.

So to Hamblinize a Montagovian semantics includes three parts: introducing a new (but parallel to the old) type hierarchy to represent alternatives, transforming lexical entries from the old system into entries that characterize alternatives (i.e. something of type ⟨st⟩ becomes something of type $\boxed{\langle st\rangle t}$), and generalizing compositional rules to either be aware or unaware of alternatives. The first two parts are mechanical, though the third isn't. Finally, above and

beyond simple Hamblinization we might add entries that introduce or manipulate alternatives, and this is what Kratzer and Shimoyama 2002 do. Without using alternative-aware operators, and only pointwise FA, the system is exactly the same is its un-Hamblinized version; the alternatives are there, but no lexical entry or compositional rule interacts with them. In fact, one could think the same about an un-Hamblinized grammar – that alternatives are latent, but not used. Just as in Barker 2002, an uncontinuized grammar is one that doesn't know about continuations, an un-Hamblinized grammar is one that doesn't know about alternatives.

At this point, it is straightforward to give compositional denotations for the various lexical items and operators used in this paper. The simpler version of disjunction is repeated from earlier:

(405) (non-compositional disjunction)
$[\![\textbf{[X or Y]}]\!]^{g,c} \underset{\text{def}}{=} [\![\textbf{X}]\!]^{g,c} \cup [\![\textbf{Y}]\!]^{g,c}$

This can be treated compositionally:

(521) **Disjunction for type ⟨s⟨et⟩⟩ (compositional)**
$[\![\textbf{or}]\!]^{g,c} \underset{\text{def}}{=} \boxed{\lambda}\, X_{\boxed{\langle s\langle et\rangle\rangle t}} . \boxed{\lambda}\, Y_{\boxed{\langle s\langle et\rangle\rangle t}} . \boxed{\lambda}\, P_{\langle s\langle et\rangle\rangle} . X(P) \vee Y(P)$

The denotation of "or", then, is a function that composes with its first two arguments by Direct FA. It returns the characterization of a set of alternatives such that each alternative is either part of the alternatives that X characterizes, or part of the alternatives that Y characterizes. This could be generalized (by a family of type-shifts) to disjunctions of all category, as in Partee and Rooth 1983. Alternatively, since all that really matters is that the types of X and Y are characteristic functions for a set of the type of P, it could simply be defined schematically:

(522) **Disjunction schema (compositional)** For any type α:
$[\![\textbf{or}_\alpha]\!]^{g,c} \underset{\text{def}}{=} \boxed{\lambda}\, X_{\boxed{\alpha t}} . \boxed{\lambda}\, Y_{\boxed{\alpha t}} . \boxed{\lambda}\, P_\alpha . X(P) \vee Y(P)$

Most of the components of my analysis are not alternative-aware, and their denotations in function-talk follow straightforwardly. One that needs to be mentioned, even if it is obvious, is the Hamblin-style question operator – this is alternative-aware in some sense, but doesn't change the alternative set in any way. The syncategorematic denotation is repeated from above in (424).

(424) (non-compositional question operator)
$[\![\textbf{[Q [}\alpha\textbf{]]}]\!]^{g,c} \underset{\text{def}}{=} [\![\alpha]\!]^{g,c}$
defined (for g, c) only if (i) $\text{Exh}_{cs_c}([\![\alpha]\!]^{g,c}) = 1$
(ii) $\text{MutExcl}_{cs_c}([\![\alpha]\!]^{g,c}) = 1$

This can be translated straightforwardly into (523).

(523) **Question operator (compositional)**

$[\![\mathbf{Q}]\!]^{g,w,c} =_{\text{def}} \boxed{\lambda}\, A_{\boxed{\langle st\rangle t}}\,.\, A$

defined (for c, A) only if (i) $\text{Exh}_{cs_c}(A) = 1$

(ii) $\text{MutExcl}_{cs_c}(A) = 1$

In this appendix I have shown how to make K&S' Hamblin semantics compositional. This is not necessarily the only, or the best way of doing so – I would not call the system developed here aesthetically pleasing, especially not the new type hierarchy. However, it does work, and it makes explicit much of what was not explicit in K&S' presentation. It also provides what is effectively an extension to Karttunen 1977a, which Hamblinizes all types instead of just clauses. Further research is clearly needed on the relationship between Hamblinized and un-Hamblinized grammars, and the relationship between Hamblinized grammars and other systems that build on Hamblin's idea of alternative semantics (e.g. Rooth 1985, 1992; Krifka 1995).

This chapter deals with two problems that were left unresolved in previous sections. Both problems, broadly construed, have to do with overgeneration – the theory of unconditionals that I have presented so far predicts readings we do not see for unconditionals, and predicts structures we do not find as (un)conditional structures. The overprediction of readings corresponds to the fact that I have so far given no account of the meaning of "-ever". Accordingly, I spend the first part of the chapter exploring "-ever" in great detail. I focus primarily on root "-ever" questions and unconditionals, and sketch an extension to free relatives. I also show that what have been called "indifference" readings in the "-ever" free relative literature involve a different species of indifference than unconditional indifference, and that the free relative variety does not arise in unconditionals, or in "-ever" questions. Therefore, its analysis is not central to an understanding of "-ever".

The second part of the chapter discusses the fact that not all kinds of interrogative structures can be adjoined as some kind of (un)conditional. For instance, we cannot adjoin a polar interrogative. I argue that in general, the way complement clauses are transferred into the clausal adjunct system is governed by semantics, and that the transfer of conditional adjuncts is in particular governed by the feature COND that I have used in previous chapters. The account I give leads to a certain amount of arbitrariness in the way the grammar encodes what can be adjoined; I argue that some arbitrariness is necessary, but that more explanation is needed. I sketch an explanation for some of these facts based on distinctions in question bias among different types of interrogative clauses.

4.1 On the meaning of "-ever"

The goal of the first part of the chapter is to give a cross-categorial account of the morpheme "-ever" that appears on "wh"-pronouns. By "cross-categorial" I mean that the goal is to account for the appearance and interpretive effect of "-ever" in multiple constructions. It appears in root interrogatives, unconditionals, and free relatives:

(524) Whoever could have done that?

(525) Whoever did that, we should applaud their efforts.

(526) We have to catch whoever did that.

Here I will focus on the first two, and only sketch an account of the third.

The proposal I make for the meaning of "-ever" is very simple in concept. Following Jacobson 1995 (who attributes a version of the idea to unpublished work of John Richardson), I suggest that what "-ever" contributes to the three constructions above is *intensional domain widening*. By "intensional" I mean that the domain that is widened is a set of worlds or

situations, not a set of individuals. By "domain widening" I mean a concept similar to that developed for free choice "any" in Kadmon and Landman 1993 (see also Krifka 1995; Chierchia 2004 among others), though the details here will turn out to be somewhat different. In fact, I propose that "-ever" does not really cause widening per se; it does not take a small domain and make it grow. What it does is introduce a presupposition that the domain is already wide along a certain dimension, determined by the issue denoted by the interrogative clause and a set of background facts or circumstances. The function of this presupposition is really to keep the domain from narrowing. In many cases where the domain is underspecified or vague, the effect of the presupposition will look similar to causation of widening, relative to many alternative ways of making the domain precise. However, what the presupposition will do is express a speaker's background beliefs about the correct shape of the domain. The speaker indicates that it is already wide in a certain way.

(527) **The proposal**
The morpheme "-ever" contributes a presupposition that the domain of interpretation for the clause it appears in is wide, relative to the content of the clause and contextually salient background facts.

Following the discussion in chapter 2, I assume here that "-ever" acts as a suffix to "wh"-items. The challenge, then, is to derive the readings involved in the various constructions from this proposal for a simple contribution of "-ever". In the case of root interrogatives, we have an expression of ignorance. In the case of unconditionals, we have an expression of ignorance or something like free choice quantification. In the case of free relatives we have an expression of ignorance, indifference, or free choice-like quantification. Note that what I have been referring to as indifference in previous chapters is distinct from the indifference readings discussed in the free relative literature. I discuss the differences below in §4.1.3; unconditional indifference is more like what has been referred to as free choice or quantificational readings in the free relative literature. I will refer to the species of indifference in free relatives as FR-indifference.

These distinctions between the constructions in fact form one argument for giving such a simple meaning to "-ever". I explore these distinctions further in §4.1.1, and argue that FR-indifference is tied to the combination of an "-ever" expression and argument position, while the quantificational readings are tied to "-ever" in the context of some kind of bi-clausal temporal relationship. There is a sense in which ignorance is at the core of "-ever", or at least the effects that can lead to ignorance readings are present across the board. Therefore, I focus on ignorance in this chapter.

I start the detailed analyses with root "-ever" interrogatives in §4.2. In §4.3 I return to unconditionals, exploring the contribution of "-ever" to quantificational sentences that can't be fully explained on the analysis in chapter 3. Finally, in §4.4, I turn to the analysis of "-ever" free relatives.

4.1.1 The distribution of readings in "-ever" constructions

The literature on free relatives has identified three kinds of readings that are apparently associated with "-ever". These are *ignorance* readings (Dayal 1997; von Fintel 2000), *indifference* (FR-indifference) readings (von Fintel 2000), and *free choice* or *quantificational* readings (Dayal 1997; Condoravdi 2005). The goal of this section is to identify the distribution of these readings, both in free relatives, and across other "-ever" constructions.

(528) Whatever Alfonso is cooking has a lot of garlic in it. *ignorance*

(529) Alfonso grabbed whatever tool was handy. *FR-indifference*

(530) Whatever exit you take will get you to MLK boulevard. *quantificational*

The distribution that we find is somewhat surprising, given past approaches to "-ever", and will be a guiding force behind the analyses I develop of questions and unconditionals. The conclusion is that FR-indifference readings are not a general property of constructions involving "-ever", and that it is ignorance readings that form the core of such constructions. FR-indifference readings are in fact attributive readings found with a range of argument-position DPs, but only with argument-position constructions.

First, I sketch some basic properties of each reading in the specific context of "-ever" free relatives.

4.1.2 Basic characteristics

An ignorance reading in an "-ever" construction involves the construction conveying that the speaker is ignorant about the identity of some individual. In (528), the speaker does not know what Alfonso is cooking. The inference of ignorance is indefeasible; this can be seen from Dayal's 1997 "namely" test:

(531) # Whatever Alfonso is cooking, namely ratatouille, has a lot of garlic in it.

An ignorance reading can be forced by "it"-clefting the free relative (this fact is first alluded to by von Fintel 2000 footnote 1, but has not been explored further as far as I know). The example in (532) expresses that the speaker does not know what tool was handy. It is unclear whether it still also expresses some kind of agent indifference. The example in (533), while still quantifying over exits, additionally signifies that the speaker has no idea which one it is that the hearer will take.

(532) Alfonso grabbed whatever tool it was that was handy.

(533) Whatever exit it is that you take will get you to MLK boulevard.

The kind of quantification involved in ignorance readings is tightly constrained by context and any head nouns present (Condoravdi 2005; Heller 2005; Heller and Wolter 2008). If we know that Alfonso is cooking ratatouille, then a sentence like (528) involving the FR "whatever Alfonso is cooking" will quantify over types of ratatouille. If we do not know this, however,

we will quantify over dishes in general, but perhaps not over particular sub-types of each dish. A head noun, if present, introduces similar restrictions to the quantification. I will assume tacitly here that Heller and Wolter's 2008 system is operating behind the scenes in all of the constructions here involving "-ever". This is necessary not just for free relatives (which are what Heller and Wolter discuss), but for unconditionals and questions.

A FR-indifference reading expresses indifference of the agent toward the choice of referents involved in the denotation of the free relative. In (529) above, the agent (Alfonso) did not care what tool he got. Crucially, as pointed out by von Fintel 2000, there is some sense in which the FR-indifference reading is *counterfactual*. That is, (529) claims both that Alfonso grabbed the tool that he did because it was handy, and that if another tool were handy, he would have grabbed that one. Similarly, in (534), Alfonso voted for the person at the top of the ballot because they were at the top of the ballot.

(529) Alfonso grabbed whatever tool was handy.

(534) Alfonso voted for whoever was at the top of the ballot.

A quantificational or free choice reading involves some kind of (apparent) quantification over choices of referent for the free relative. While in the actual world the free relative in (530) presumably refers to the particular exit that the hearer will take, it claims that for any of those exits the desired result will happen. The reason this has sometimes been called a free choice reading is that there is often a close paraphrase involving free choice "any", usually also involving a "subtrigging" structure (where the free choice interpretation is apparently licensed by a relative clause).

(530) Whatever exit you take will get you to MLK boulevard.

(535) Any exit you take will get you to MLK boulevard.

I will not use the free choice label because there are quantificational free relatives that do not have such a paraphrase.

There is a certain amount of overlap between the quantificational readings and the others. For instance, there is a sense that it doesn't really matter, to the speaker or hearer, what exit is taken in (530). The speaker is also at present ignorant of what exit the hearer will take. Not all quantificational readings lead to these; for instance (536) requires neither FR-indifference/counterfactuality or ignorance.

(536) Alfonso read whatever books Joanna read.

This example simply identifies the reading habits of Alfonso exactly with those of Joanna. It may be that Alfonso was choosing to base his reading habits on Joanna's, but (536) is perfectly compatible with a scenario where it was an accident that Alfonso read the same books.

The status of free choice implications in free relatives Just as with unconditionals, the question arises as to whether the different implications present in "-ever" free relatives are at-issue entailments, presuppositions, implicatures, or something else. Dayal 1997 treats them as

entailments, and also demonstrated the non-defeasibility of ignorance implications. von Fintel 2000 treats ignorance and FR-indifference implications as presuppositions, but noted a complication: in some examples the FR-indifference reading does not project.

(537) Unless Zack simply voted for whoever was at the top of the ballot, he must have spent at least 5 minutes in the voting booth. (von Fintel 2000)

(538) Unless John takes whatever car becomes available first, we won't make the ferry. (Condoravdi 2005)

The paraphrase of the example in (537) is something like "unless Zack behaved as if he didn't care..." That is, it is part of the content of the clause embedded under "unless". Ignorance implications, on the other hand, do project:

(539) Unless whatever John sends us is quite short, we will have to cut down our part of the proposal. (Condoravdi 2005)

This example indicates that the speaker does not know what John will send. It does not mean "unless I don't know what John will send and the thing he sends is quite short, we will have to cut down our part." Such a reading is clearly impossible in a quite general way, though it would be expected if a FR-indifference implication were interpreted locally.

Condoravdi 2005 further shows that ignorance readings are not filterable, in the sense of Karttunen 1973. Since they show projection-like behavior, and so are presupposition-like, this is quite surprising.

(540) Alfonso has a brother but I dislike his brother.

(541) I don't know what she is cooking but I'll eat whatever it is she has put on my plate. (modified from Condoravdi)

The example in (540) entails, but does not presuppose, that Alfonso has a brother. The effect of putting the content of a presupposition into the first conjunct is to turn it into part of the at-issue, and not presuppositional, content of the larger structure. This does not happen in (541), which still seems to presuppose that the speaker is ignorant of what is on his plate. This can be seen by further testing the projection behavior of the attempted filtering structures:

(542) It is not the case that Alfonso has a brother and I dislike his brother.

(543) It is not the case that I don't know what she is cooking but I'll eat whatever it is she has put on my plate.

The sentence in (543) conveys that the speaker does not know what has been put on the plate, but the sentence in (542) does not convey that Alfonso has a brother. (Note that (543) has to be read with intonation forcing conjunction to take scope under negation.)

The quantificational/free choice readings are not so easy to disentangle from the main content of the sentence. This makes it hard to test their status. They basically seem to contribute to the at-issue entailments. They are not defeasible, and do not project, as can be seen from the following examples:

(544) # Alfonso read whatever Joanna did, but he didn't read everything she did.

(545) Did Alfonso read whatever Joanna did? (does not convey that he did.)

Thus, previous examinations of the status of these implications leave us in something of a state of confusion. Not only are ignorance and FR-indifference distinct, ignorance doesn't even fit into the familiar classification. This raises the question of how far we really want to go in unifying the analysis analysis of the two kinds of readings. I will end up treating the presence of "-ever" as a unifying factor, but the derivation of the readings will be quite different. Later in this chapter I will add some further data to the pool. I will argue that embedded FR-indifference readings are often quite marginal without the presence of an embedded "just" or "simply", something seen in nearly all the examples discussed in the literature. I will also suggest that the reason why ignorance implications appear not filterable, is that it is not possible to directly state the relevant presupposition in natural language.

4.1.3 Unconditional indifference vs. FR-indifference

In previous chapters I have referred to the contribution of an unconditional as the indifference implication. Intuitively, this is because the speaker makes a claim that it doesn't matter what the choice of alternative is with respect to the truth of the consequent. The speaker expresses indifference with respect to the choice of alternative, relative to the consequent. The term indifference has been used in a somewhat different way in the free relatives literature (cf. von Fintel 2000; Condoravdi 2005; Tredinnick 2005; Vlachou 2007) and again in a slightly different way in the literature on free choice items (cf. Kratzer and Shimoyama 2002). In all of these uses, the basic idea is that someone doesn't care about something. But the uses differ with respect to who it is that doesn't care, what kind of thing it is that isn't cared about, and how the not caring fits in with the semantic contribution of the utterance it appears in.

(546) Whether Alfonso or Joanna brings the salad, it will have feta cheese.
Indifference: it doesn't matter who brings the salad.

In unconditionals, as I have shown in the earlier parts of this dissertation, it is the resolution of an issue that is not cared about – e.g. the answer to some question. It is the speaker who expresses the lack of caring, and the lack of caring is crucially relativized. That is, the not caring has a discourse purpose – the resolution of the issue doesn't matter with respect to the resolution of some other issue. In other words, indifference in an unconditional amounts to a claim of the orthogonality of two issues. One way of thinking about this is that for unconditionals, the indifference claim is situated in the discourse situation. The lack of caring is in some sense impersonal – the speaker may strongly prefer one or the other to bring the salad in the above example, but with respect to identifying the presence of feta cheese, the speaker doesn't care.

(547) Alfonso simply voted for whoever was at the top of the ballot.
Indifference: Alfonso didn't care who was at the top of the ballot.

In free relatives with a FR-indifference reading, all of these properties are different. It is invariably the agent of some event who doesn't care, and it is the identity of some object that they don't or didn't care about. The purpose of indifference here is not to relate some issues in discourse, but to contribute to the description of some event. The agent's indifference is situated in the described situation, not the discourse situation.

The indifference implications discussed in the literature on free choice items are closer to those in free relatives, but are not uniform. I will not attempt to do an exhaustive survey here, but focus on an illustrative example from Kratzer and Shimoyama 2002 (who get the example from Autorenkollektiv 1981):

(548) Hans: Wen soll ich einladen?
who shall I invite?
Maria: *Irgendjemand* / #Jemand.
somebody.or.other / somebody

Here, the speaker expresses indifference to the identity of the person who Hans invites. Note that it also happens that the identity of the individual also corresponds to the resolution of an issue present in the discourse (who Hans invites), but this is an epiphenomenon of the question/answer structure of the example. Another difference between examples of this kind and indifference in free relatives is that Kratzer and Shimoyama 2002 argue that indifference for "irgendjemand" is an implicature, whereas von Fintel 2000 shows that for "wh-ever" free relatives, it is a presupposition or entailment, not an implicature.

In summary, there are two key differences between unconditional indifference and free relative/free choice-indifference. The first is that for the latter cases, it is the identity of some referent that does not matter to someone (speaker or agent), whereas in the unconditional case, it is the resolution of some issue (the antecedent) that does not matter. This leads to the second key difference: in unconditionals it is not some person's preferences that it doesn't matter for, but the resolution of some other issue (the consequent). The verb "matter" can express all of these possibilities, but unconditionals express only the second kind of indifference.

(549) Who we invite doesn't matter to me.

(550) Who we invite doesn't matter; we will still make vegetarian food.

Note that this discussion implies that we do not find FR-indifference in unconditionals; this is correct, and I will return to this point below.

In the next several sections, I examine ignorance, quantificational, and FR-indifference readings in turn, giving details on what conditions the readings, and which "-ever" constructions they appear in.

4.1.4 Distribution of ignorance readings

Ignorance readings have the widest distribution, and in fact all three "-ever" constructions can be used to express ignorance. Ignorance is a key characteristic of "wh-ever" questions, in that they can only be used in this way.

	ignorance reading
"wh-ever" question	✓
"wh-ever" unconditional	✓
"wh-ever" free relative	✓

Table 8: Distribution of ignorance readings

(551) Whoever could have done that?

(552) Whoever claimed that gapping isn't ellipsis?

Such questions express speaker ignorance that is strong enough to give the question a nearly rhetorical feel. They are not actually rhetorical (since they can have a real and non-trivial answer), but the speaker is expressing that they don't have even a remote idea about the answer, and that all the possibilities they can imagine seem extremely unlikely.

Ignorance readings are also found in unconditionals. Imagine the following uttered in a context where Alfonso needed to make a major decision, and we know he went and talked to someone about it.

(553) Whoever Alfonso talked to, he got bad advice.

The example in (553) expresses speaker ignorance. We can see that this is not defeasible by attempting to apply either a regular cancellation test, or Dayal's "namely" test (still keeping the above scenario in mind):

(554) # Whoever Alfonso talked to, namely Joanna, he got bad advice.

(555) # Whoever Alfonso talked to, he got bad advice, and he talked to Joanna.

The reason for the particular scenario I described, and the reason for keeping it in mind when examining the above examples, is that we don't typically get ignorance readings when the "wh-ever" clause is interpreted in a non-episodic way (Reynolds 2007). This scenario forces episodicity. For instance, (555) is acceptable on a non-episodic, non-ignorance reading where Alfonso talked to multiple people in the course of some time period, got bad advice from them all, and the speaker happens to know that one of those was Joanna. A non-episodic reading can be forced with certain time adverbials:

(556) Over the course of last year, whoever Alfonso talked to, he got bad advice.

The adverbial in (556) leads to an interpretation where there were a series of talking(/advising) events over the last year. This is compatible with the speaker not knowing who it was that Alfonso talked to, but does not require it. The speaker could know every single adviser, and could even be one herself.

As with free relatives, "it"-clefting the "wh-ever" clause forces an ignorance reading.

(557) Whoever it was that Alfonso talked to, he got bad advice.

We of course get ignorance readings with "-ever" free relatives as well, in Dayal's well known examples discussed above. An observation that I will add is that the episodicity requirement seems to apply to these as well. Non-episodic free relatives can convey ignorance, but do not necessarily. We can again see this by using appropriate time adverbials:

(558) Whoever it was that Alfonso talked to gave him bad advice. (ignorance only)

(559) Whoever Alfonso talked to gave him bad advice. (ambiguous)

(560) Over the course of the last year, whoever Alfonso talked to gave him bad advice. (ignorance not required)

With respect to the presence of ignorance, the three constructions are closely parallel. This is good news for a unified treatment of "-ever". It is worth noting that the ignorance reading in root questions is intuitively "stronger" than we find with the other two constructions, in a hard-to-pin-down way. This, I will argue, arises from the pragmatics of questions in combination with the meaning of "-ever". That is, the apparent difference in effect of "-ever" on speaker ignorance falls out from the semantic/pragmatic "function" of the clause it appears in. In general, we can draw the conclusion that ignorance is closely tied to "-ever".

4.1.5 Distribution of quantificational readings

	quantificational reading
"wh-ever" question	
"wh-ever" unconditional	✓
"wh-ever" free relative	✓

Table 9: Summary of distribution of quantificational readings

We simply do not find anything parallel to quantificational readings when examining "wh-ever" questions. There are such questions that allow multiple answers:

(561) Whoever did Alfonso find to talk to when he was living in Siberia?

However, in cases where a quantifier can apparently out-scope a normal interrogative pronoun, leading to a pair-list answer, we do not find parallel behavior with a "wh-ever" question. We also do not find multiple "wh" root questions involving "-ever".

(562) Who graded what/each paper?

(563) * Whoever graded each paper?

(564) * Whoever graded what?

It is not obvious that a multiple-"wh" reading would in fact be parallel to the quantificational readings seen in the other two constructions, but the fact that we cannot get them is independently interesting.

In some sense it is not surprising that there is no clear parallel to a quantificational reading in a root question. This is because, intuitively, it is the interplay between the tense/aspect found in the "wh-ever" clause and that in the main clause that lead to the quantification.

Both unconditionals and "wh-ever" free relatives have obvious quantificational readings.

(565) Alfonso read whatever books Joanna did.

(566) Whatever book Joanna read, Alfonso read it too.

In (565), we have something intuitively like universal quantification over books Joanna read. The same effect appears in (566), and in fact these sentences mean something quite similar.

The conclusion I will take away is that quantificational interpretations of "-ever" constructions are crucially tied to the bi-clausal structure.

4.1.6 Distribution of FR-indifference readings

	FR-indifference reading
"wh-ever" question	
"wh-ever" unconditional	
"wh-ever" free relative	✓
plain free relative	✓
definite description	✓

Table 10: Summary of distribution of FR-indifference readings

In this section we see the plot twist that unconditionals bring to the study of "-ever". The surprising fact is that unconditionals can't involve FR-indifference readings in the same sense that free relatives do. Questions also can't lead to such a reading, but this is perhaps less surprising. I further argue, based on evidence from adverbs like "simply" and "just", that FR-indifference readings are crucially tied to argument position (definite) descriptions. This provides support for an analysis of FR-indifference readings as attributive readings of definite descriptions, following Dayal 1997. However, the overall distribution of readings suggests (contra Dayal) that it is *only* FR-indifference that involves an attributive reading, not ignorance.

No FR-indifference in unconditionals The pair in (567) and (568) illustrates this distinction. The dominant reading in (567) is a FR-indifference reading, where Alfonso grabbed some tool on a particular occasion, and didn't care which one it was. There is also a quantificational reading available, where on a number of occasions it happened that Alfonso grabbed the handy tool. There may be an ignorance reading available as well, though "handy" biases

the example away from such a reading. The example in (568), in contrast, leads only to a (slightly odd) speaker-oriented ignorance reading, or a quantificational reading. It is of course compatible with Alfonso not caring, but does not require it.

(567) Alfonso grabbed whatever tool was handy.

(568) Whatever tool was handy, Alfonso grabbed it.

One might imagine that the difference in information structures in the two sentences would interfere. It is not clear what exactly the information structure in a sentence like (568) is in the first place (this question might reduce to what the information structure in a conditional is.) However, we can topicalize a free relative and get something reasonably close, that behaves exactly like (567) with respect to the readings of the free relative:

(569) Whatever tool was handy, Alfonso grabbed (and whatever tool was far away, he ignored).

Before proceeding to the question of how special FR-indifference readings are, I will make some observations about the role of the predicate in FR-indifference free relatives.[72] The choice of predicate seems to be crucial in biasing a free relative towards a FR-indifference reading. A predicate like "handy", which is commonly used in examples in the literature, has two important properties. It is highly contingent – what is handy is going to vary quite a bit depending on the world of evaluation, given what forms a typical common ground. Its contingency is going to be across potential actual referents; almost anything in any circumstances could be handy. This differs from e.g. "is cooking", where typically there is only one potential referent in any world, though what the referent is may vary across worlds. The second property is that a predicate like "handy" intrinsically provides a motivation for certain actions. That is, in any given world, potential referents are implicitly ordered by how handy they are, and this ordering makes the ones that are most handy the most likely choices for various actions, such as grabbing. For most actions, all other things being equal, someone will prefer the thing that is most handy. To see these effects in action, the following two sentences:

(570) Alfonso grabbed whatever tool was least handy.

(571) Alfonso looked at whatever tool was handy.

Each of these sentences still has the potential of a FR-indifference reading. However, I have biased against this reading, in the first example, by inverting the scale of handiness via "least", and in the second, by changing the action to one where the scale of handiness doesn't provide any motivation to the choice of referents. We can even more strongly bias against a FR-indifference reading by changing the predicate entirely:

(572) Alfonso grabbed whatever tool was green.

(573) Alfonso looked at whatever tool was green.

[72] Thanks to Bill Ladusaw (p.c.) for pointing these facts out to me.

Again, it is possible for (572) to have a FR-indifference reading, but it requires some circumstances where the greenness of the tool was known to be what was important to Alfonso. (I.e. the context already basically providing the FR-indifference component.)

In general, predicates that lead to FR-indifference readings are ones that have some implicit modality, e.g. "tough" predicates ("easy", "hard", "fun", "interesting", "amusing", etc.), and predicates of personal taste.

FR-indifference and "simply", "just" There is another way to force a free relative to have a FR-indifference reading beyond just choosing the right predicate. This can be seen in many examples in the literature, though I don't know that it has been pointed out explicitly before. Example (573) above is strongly biased towards an ignorance reading, to the point where it's not clear that FR-indifference is possible without a highly specific context. However, we can force it back the other way by use of the adverbs "simply" and "just":

(574) Alfonso simply looked at whatever tool was green.

(575) Alfonso just looked at whatever tool was green.

In many examples discussed in the literature, therefore, it is the combination of these adverbs and the "wh-ever" free relative that leads to the FR-indifference reading. It is not simply the free relative by itself.

Earlier in the chapter I noted that nearly all examples of embedded FR-indifference implications discussed in the literature have a "just" or "simply" embedded along with the implication. Without these adverbs, such examples become much more difficult to understand. Note that Condoravdi's 2005 example, in (538), is not given with such an adverb.[73] However, I do not think that the FR-indifference reading is available without implicitly sticking in such an adverb when thinking about it. When speakers are explicitly alerted to this possibility (i.e. the interference of an adverbial paraphrase is controlled for), speakers reliably judge the sentence as odd or as not involving FR-indifference. (Once again, there is a sensible ignorance-only interpretation in many of these cases.)

(576) a. Unless Zack simply voted for whoever was at the top of the ballot, he must have spent at least 5 minutes in the voting booth. (von Fintel 2000)

b. # Unless Zack voted for whoever was at the top of the ballot, he must have spent at least 5 minutes in the voting booth. (von Fintel 2000)

(577) a. Unless John simply takes whatever car becomes available first, we won't make the ferry. (Condoravdi 2005)

b. # Unless John takes whatever car becomes available first, we won't make the ferry.

This further complicates the status of the different kinds of implications. If what I have suggested here is right, FR-indifference implications of free relatives to not clearly pattern as

[73] This example does involve "available", a modal predicate like "handy". The presence of such predicates also seems to help license FR-indifference in embedded contexts.

entailments (not projecting) or as presuppositions (projecting). It is only in combination with "simply" or "just" that they do so, and with such an adverb, the FR-indifference effect is clearly an entailment. Understanding the role these adverbs play in such data is therefore crucial.

FR-Indifference without "-ever" This point can be taken further. "Simply" and "just" force FR-indifference readings in a range of definite descriptions:

(578) Alfonso simply/just grabbed the tool that was handy.

(579) Alfonso simply/just grabbed what was handy.

The example in (578) means that Alfonso grabbed the tool that was handy because it was handy, and that the handiness is what mattered to him. If another tool were handy, he would have grabbed that one.

These adverbs aren't necessary in order to get a FR-indifference reading; simply putting a modal predicate inside a definite description is enough to lead to one:

(580) Alfonso grabbed the tool that was handy.

(581) Alfonso grabbed what was handy.

The difference is that the adverbs force a FR-indifference reading, while the definite descriptions alone are simply compatible with one. A further difference from the plain definite case and all the others is that only for a plain definite is a FR-indifference implication defeasible:

(582) Alfonso grabbed the tool that was handy, and he wouldn't have grabbed the file if it were handy.

(583) # Alfonso simply grabbed the tool that was handy, and he wouldn't have grabbed the file if it were handy.

(584) # Alfonso grabbed whatever tool was handy, and he wouldn't have grabbed the file if it were handy. (ok on other readings.)

(585) # Alfonso simply grabbed whatever was handy, and he wouldn't have grabbed the file if it were handy.

In summary, these adverbs force a FR-indifference implication in any kind of definite description. When they do so, they seem to meld the FR-indifference implication in with the local truth-conditions to take the shape of a straightforward entailment. In definite descriptions and plain FRs, without such an adverb, FR-indifference is possible but easily defeasible, as well as context-dependent. In "-ever" FRs without such an adverb, FR-indifference is not defeasible, but shows oddness in contexts where we might expect it to project or incorporate into the local truth-conditions.

What is the role of adverbs like "simply" and "just"? Here we can turn to Horn 2000b who, while focusing on "not just", also gives a theory of "just". According to Horn, "S is just P" asserts that S is not ranked above P on the appropriate scale, and presupposes that S is ranked

as at least P. (This differs from "only", on Horn's view, in that "only" presupposes instead that S is P. Note that "only" works just as well as the other two adverbs in many examples; it is the asserted component that is important here.) The use in the examples here is more complicated than a simple predicative use. At a first pass, the scale intuitively seems to consist of ways of describing the referent. That is, the speaker chooses the most specific description that applies to the object, and presupposes that the description is at least adequate. This can be seen a little more clearly by considering the following sentence, perhaps in answer to a question like "why did you grab the hammer?" – this allows us to conform more closely to the structure of Horn's definition.

(586) The hammer was just the tool that was handy.

Intuitively, the speaker is saying that no more specific properties were relevant to the choice than its handiness. The hammer being handy was the strongest reason involved in its choice. Thinking about how to extend Horn's analysis of "just" to definite descriptions in the scope of "just" suggests that descriptions are ordered (pre-theoretically) by how specific they are, and "just" contributes to an assertion that the description chosen is the highest (most specific) element that is appropriate on the scale of ways to describe the referent. It also would contribute the presupposition that the referent can be described by no weaker/less specific description. The effect of this presupposition is a little abstract and not so easy to see in cases where the referent is not known, but the asserted component is exactly what we want here.

In fact, it is even possible to get a FR-indifference reading with an indefinite.

(587) Alfonso (just) grabbed a tool that was handy.

The sentence in (587) implies that Alfonso would have grabbed any tool, as long as it was handy. This implication is similarly "strengthened" by the presence of "just".

4.1.7 Distributional Conclusions

It is clear that FR-indifference implications in "wh-ever" free relatives differ significantly from the other potential contributions of such a free relative. FR-indifference implications of this kind are tied to DP-type meanings, not to the presence of "-ever". Correspondingly, they can also appear in other kinds of definite descriptions. They depend heavily on the modality of the predicate involved. Finally, they are forced by certain adverbs, adverbs which in this context seem to act as minimizers on a scale of descriptiveness/specificity imposed on definite descriptions.

Ignorance readings, on the other hand, appear across the full range of "-ever" constructions, in argument position or not. They depend on the episodicity of the clause they appear in, but otherwise can appear in a way that seems independent of the predicate. They are forced by "it"-clefting, and in general seem to be a kind of default reading.

Quantificational readings do not appear in questions, but appear both in and out of argument position. To a certain extent, they may appear in concert with other readings. They

seem to rely on having the two-clause aspect structure, where the "wh-ever" structure is "subordinated" in some way.

This array of evidence points in a clear analytical direction. Dayal 1997 proposed that both ignorance and FR-indifference involve attributive readings of definite descriptions in the sense of Donnellan 1966. This idea has not been the focus of research that has responded to Dayal's proposal, but the evidence here suggests that it should be revived exactly for FR-indifference readings of free relatives. Such readings being specific to argument position, and appearing in a range of definite descriptions, is exactly what we'd expect if they involve attributive definite descriptions. Ignorance readings, on the other hand, do not pattern as attributive readings, but seem more general. Similarly with the quantificational/free choice readings. The facts about "just" and "simply" suggest that such adverbs strengthen a certain class of attributive readings into entailments.

Semantically, then, ignorance and pseudo-universal quantification must arise somehow from the contribution of "-ever". For this reason these two kinds of readings will be the focus of this chapter. I have not given an analysis of how FR-indifference readings arise here, but I have suggested that they arise through an entirely different process.[74]

4.2 "-ever" in questions

Questions with "-ever" provide a good starting point for investigation of "-ever", as they express pure ignorance. The complication of quantificational readings and FR-indifference readings can be set aside for the moment.

(588) Whoever is Alfonso talking to?

(589) Whoever could Alfonso be talking to?

The idea is simple: "-ever" contributes a presupposition that the intensional domain of interpretation for the clause is widened. (On the idea of domain widening see, among others, Kadmon and Landman 1993; Krifka 1995; Chierchia 2005; Anderssen 2006.) For a question, the domain of interpretation is the same domain that is partitioned in the sense of Groenendijk and Stokhof 1984. Therefore, "-ever" requires that a very large domain of possibilities is partitioned, and that answers will include very unlikely possibilities. This leads to an expression of speaker ignorance, because of the inclusion of these remote possibilities in the partition. For a normal constituent question, the domain of interpretation is usually much more restricted with respect to which worlds are partitioned, but "-ever" blocks any such restriction.

The crucial question that we must now answer, and that hasn't really been answered by previous literature on domain widening, is "how wide?" It is clear that we don't want to go quite as far as the entire domain of possible worlds. That is, even "-ever" questions do not

[74]There is one key distinction between indifferent "wh-ever" free relatives and indifferent descriptions of other sorts; the FR-indifference implication is not defeasible, even without "just" or "simply". This suggests that while "-ever" is not necessary for such a reading, it is sufficient, and it is sufficient in a way that, if the reading arises dues to "-ever", it is not cancelable.

admit possibilities that seem in contradiction with known facts. For instance, if we can see that the person Alfonso is talking to is female, the question in (588) is still felicitous, and doesn't admit the possibility of Alfonso talking to someone male (or at least, someone male who is not cross-dressing). It does, of course, still express the speaker's ignorance as to what (female) person Alfonso could possibly be talking to.

What I propose here is that the domain is widened up to *remote possibility*. That is, for the domain of interpretation, we use the largest set of possible worlds that is compatible with the remote possibility that the content of the clause is true, relative to what is previously taken for granted by discourse participants. Note that this may not actually force widening. What it will always do is block any implicit domain restriction along the direction of widening. When widening is forced for some reason, this will actually be by accommodation of the wideness presupposition, rather than an independent widening process.

In considering the technical implementation of this idea, there are several questions that must be answered. What set of worlds specifically is the domain in question that is widened? What is meant by "remote possibility"? What is meant by "content" of the clause? Before proceeding to the discussion of the details of analysis, I will first examine the properties of "-ever" questions in context, with the aim of empirically justifying the widening/blocking of implicit domain restriction. I then discuss den Dikken and Giannakidou's 2002 proposal for the interpretation of "wh-"expletive questions, which have similar properties to "-ever" questions.

4.2.1 "-ever" questions in context

In this section I explore in more detail the interpretation of "-ever" questions using the minimal pair technique of Gunlogson 1999. That is, everything about the examples is to be held constant, except for the presence or absence of "-ever". Insofar as it is possible, I will also try to hold the context of utterance constant. However, because many of the examples involve resolution of vagueness with respect to the prior content, this won't always be possible. The use of minimal pairs allows us to isolate the contribution of "-ever" to a question in a very precise way. I give parallel tests for a variety of "wh-"pronouns. The conclusion is that while regular "wh-"pronouns are compatible with narrow, salient, contextually determined domains, "wh-ever" pronouns are not.

To start with, consider the scenario in (590). The function of the scenario is to set up a natural domain of people for items such as "who" to use.

(590) Scenario: S and H are at a conference, and see Alfonso outside the door to the poster session talking to some woman X that S does not recognize.

a. S: Who is Alfonso talking to?

b. S: Whoever is Alfonso talking to?

The most natural way of interpreting the question in (590a) is that S is assuming that X is someone attending the conference, or highly relevant to the conference. In the version with

"-ever", however, S seems to reject this implicit choice of a relatively narrow domain. In fact this question may even convey that S thinks it is unlikely that X is from the obvious domain. Note that (590a) is in principle compatible with a wide domain, but this isn't the default.

Here is another example of this kind, where the natural domain for "who" is even more restricted:

(591) Scenario: H hates the phone, and only ever talks on it with his mother, and his two sisters (this is well-known to H's friends). S is visiting. H gets a phone call and talks for half an hour.

a. S: Who was that on the phone?

b. S: Whoever was that on the phone?

When S asks the question in (591a), it is natural for a hearer to assume that they are expecting one of the obvious three possibilities as answers. Note that here, the plain question does not require this; it is this question in this context that leads to the expectation. The question in (591b) is not compatible with this assumption, on the other hand. It would really only be appropriate to ask (591b) if something about the conversation sounded unusual, or suggested some unlikely possibility for a potential caller. Note that this question does not preclude the contextually likely possibilities, it just also includes some other less likely possibilities. Because of the inclusion of extra possibilities, the likelihood of the alternatives that were previously likely will be lowered, relative to answers to the question.

Let us now turn to "what"; here I examine the locution "what(-ever) happened to X", which is a common and highly non-archaic way to use an "-ever" question.

(592) Scenario: S and H are at a party, along with Alfonso. S notices that he has not seen Alfonso in 10 minutes or so.

a. S: What happened to Alfonso?

b. S: Whatever happened to Alfonso?

Intuitively, S in (592a) is most likely expecting a relatively straightforward response – e.g. "he left", or "he went to the bathroom". That is, the domain of things that could have happened to Alfonso is relatively constrained. In (592b), on the other hand, these may be potential answers still but S is considering more exotic or surprising possibilities. Another way of describing this intuition is that S in (592b) had the expectation that Alfonso would still be around, and something extraordinary must have happened to prevent that.

The following scenario is based on an example from the BNC (Davies 2004-).

(593) Scenario: H has just given S a decorative box as a present. The two live in a small town and S knows that H hates to leave the town or shop on the internet, and normally does all of his shopping there; H knows that S knows this, also.

a. S: Thank you for the lovely box; where did you get it?

b. S: Thank you for the lovely box; wherever did you get it?

In this scenario, the default interpretation for (593a) is that S is simply asking which of the local shops H bought the box from. The domain for "where", because of H's publicly known preferences, narrows in this scenario. This isn't so in (593b). At the very least this sentence expresses incredulity that the box could have been bought at any of the local stores – it suggests that all of them are unlikely. It seems to suggest that H might have done something very unlikely such as order the box on the internet.[75]

In all of these examples, we can see that "-ever" questions resist domain narrowing due to implicit contextual factors, in scenarios where the plain versions of the same questions are compatible with it. The other effect of "-ever" is to make what would be a priori likely answers in certain contexts much less likely. It never precludes them altogether, but reduces them to a small space of the probability mass corresponding to possible answers.

How are we to understand this distinction in a theoretical way? Here I follow Lewis 1979 in a discussion of relative modality. Lewis points out that in normal circumstances, when making modal claims, we tend to ignore possibilities that we consider unlikely or not relevant by default. However, the boundary can be explicitly shifted outwards:

> Suppose I am talking with some elected official about the ways he might deal with an embarrassment. So far, we have been ignoring those possibilities that would be political suicide for him. He say: "You see, I must either destroy the evidence or else claim that I did it to stop Communism. What else can I do?" I rudely reply: "There is one other possibility – you can put the public interest first for once!" *That would be false if the boundary between relevant and ignored possibilities remained stationary.* But it is not false in its context, for hitherto ignored possibilities come into consideration and make it true. And the boundary, once shifted outward, stays shifted. If he protests "I can't do that", he is mistaken. (Lewis 1979 p.183, my emphasis)

This idea is presented in a context specific to modality (though Lewis discusses similar ideas with respect to resolution of vagueness of gradable adjectives in context). How does it connect to the present set of data, where no modal verbs are involved? I suggest that what we are doing in normal instances of constituent questions by default, in a defeasible way, is ignoring irrelevant or unlikely possibilities. The function of "-ever" is to prevent us from doing that. The bridge between the way Lewis discusses the shifting of boundaries in relative modality, and the possibilities involved in the semantics of questions (and the other constructions discussed later) comes via the Stalnakerian context set. According to Stalnaker 1978, the function of an assertion is to add new information into our model of the discourse. This model (simplifying for a moment; I return to it in more detail in §4.2.3) takes the form of the context set, a set of possible worlds representing the mutual public beliefs of discourse participants. An assertion, in adding information to the context set, reduces the context set. This set is in fact a representation of possibilities, and it is an inherently modal notion (cf. Stalnaker 1998 p. 6: the

[75] Of course, S might not really mean this sentiment, and might just be being polite in this scenario.

idea of a context set is an instance of "the familiar relational structure that one finds in modal semantics, and semantics for knowledge and belief operators.") That is, relative to the context set, any assertion is a modal claim – it is true at every world in the post-update context set. Similarly, any question divides up a space of modal possibilities (see §4.2.3 for more details).

My claim is that our model of what the context of discourse is is vague, in exactly the way that modal domains are. By default we tend to assume that we are using a precisification of the discourse model that excludes irrelevant or unlikely possibilities. (Of course, what is relevant or likely is also in and of itself a vague notion.) But if such possibilities are explicitly raised in some way, we cannot continue to implicitly exclude them, just as Lewis' politician can no longer pretend that putting the public interest first is not an option. Regular questions simply go along with the default. Questions with "-ever" explicitly mention the unlikely cases – and so thereafter they must be taken into account.

Next I consider questions with expletives in the "wh"-phrase. These involve both similarities and differences to "-ever" questions that will allow us to further probe the meaning of "-ever".

4.2.2 "wh-"expletive questions

"Wh-ever" questions are intuitively quite similar to a variety of question involving expletives such as "the hell", "the fuck", "on earth", "in the name of God", and so on:

(594) Whatever is taking Alfonso so long?

(595) What the hell is taking Alfonso so long?

(596) What on earth is taking Alfonso so long?

The baseline similarity between these kinds of questions is that they can express speaker ignorance. Within the expletive questions, there are two categories: those involving a true expletive with expressive content (e.g. "the hell"), and those where the expletive does not seem to have much expressive content (e.g. "on earth"). (See Kaplan 1999; Kratzer 1999; Potts 2003 on expressive meaning.) I will focus on the second type of expletive question here, as "wh-ever" questions also do not contribute any expressive content.

There are two primary differences between "-ever" questions and non-expressive expletive questions. The first is that expletive questions are more productive, whereas many "-ever" questions, especially out of context, feel non-colloquial to many speakers. The second is a very subtle meaning difference that I will elucidate shortly; for an "-ever" question we consider all possibilities, making everything seem unlikely, and for an expletive question, we consider only what are, prior to the question, less likely possibilities.

I do not give any analysis of the intuition that "-ever" questions are non-colloquial. I do assume that they are still fully present in the grammar, as speakers do produce them on a regular basis, and that they should be given a semantic analysis on par with other "-ever" constructions that do not seem so non-colloquial. The reason for this second assumption is that speakers are quite reliable at judging the meaning of "-ever" questions despite them seeming archaic. There

are certain forms of "-ever" questions that are extremely common (e.g. in corpora) and are entirely colloquial to all speakers, and to a certain extent I will use examples of this kind to control for archaicity. This is especially helpful when comparing with expletive questions. The particular form that I have in mind here involves "whatever happened to...":

(597) Scenario: speakers are talking about Alfonso, who we knew years ago.
Whatever happened to Alfonso?

This can now be compared with a parallel expletive question:

(598) (Same scenario)
What on earth happened to Alfonso?

The intuitive difference between (597) and (598) is that in the "-ever" example, the speaker simply has no idea, whereas in the "on earth" example, the speaker believes that the more likely possibilities haven't happened. That is, a speaker of (598) might have expected to have heard from Alfonso, or read about him in the alumni magazine, or something along these lines; but they did not. The "-ever" question, on the other hand, is compatible with an expectation of this kind, but does not require one. It seems to express that all possibilities, whether they were likely or not, are being considered equally for the purposes of the question.

It is helpful here to be precise about two senses of what is likely. The first is what might be considered likely or unlikely independently of the question – possibilities that are a priori likely or unlikely. These largely correspond with what the default domain of interpretation will be for a regular constituent interrogative, as discussed in the previous section. The second sense is what the question conveys about likelihood. Questions with "-ever" convey that every possibility is unlikely; they do not seem to be sensitive to what was a priori likely or unlikely. Expletive questions also convey that every possible answer is unlikely, but they seem to exclude possibilities that were a priori likely. This distinction parallels one in the literature on question bias – on some analyses questions convey bias (e.g. van Rooy and Safarova 2003), and on some, they react to bias already present in the discourse context (e.g Gunlogson 1999; Büring and Gunlogson 2000). (What Bill Ladusaw (p.c.) has termed prospective and retrospective bias, respectively.) In fact probably both notions are probably involved at some level of the analysis of bias, just as both notions of likelihood are involved with the analysis of "-ever" and expletive questions. (I return to the issue of question bias later.)

The likelihood intuition replicates with more short-term scenarios:

(599) Scenario: the speaker notices that Alfonso has been gone from the party for a while.
Whatever happened to Alfonso?

(600) (same scenario)
What on earth happened to Alfonso?

In the case of the "-ever" question, the speaker simply has no idea what happened to Alfonso and is considering all possibilities, even unlikely ones. Everything they consider, including those possibilities that might have been previously considered likely, are considered

unlikely relative to the question. In the case of the expletive question, the speaker thinks that something that would be independently considered surprising or unlikely has happened to Alfonso. You would not say (600) in a scenario where you think that Alfonso might have gone to the restroom (unless, of course, you mean to express that something else must have happened on the way).

Aside from this difference of likelihood, the two kinds of questions seem intuitively similar. They both express a sort of extreme ignorance. Therefore it is worth considering analyses of the semantics of expletive questions, to see if they might apply to "-ever" questions. den Dikken and Giannakidou 2002 provide such an analysis:

> When attached to a *wh*-word, the modifier *the-hell*, we argue, extends the domain of quantification to include familiar and novel values. This we call domain extension. As a result of domain extension, the domain of quantification for *wh-the-hell* is the entire domain D, and not just a presupposed subset of it, as with regular *wh*-words. (den Dikken and Giannakidou 2002 p. 43)

Den Dikken and Giannakidou connect domain extension to domain widening in the sense of Kadmon and Landman 1993. The analysis also includes a presupposition expressing a "negative attitude", which accounts for what I am discussing here as the likelihood facts:

(601) **Presupposition of negative attitude of "wh-the-hell"**
(den Dikken and Giannakidou 2002 ex. 38)
In the actual world w: If $\exists x\,[P(x)(w) \wedge Q(x)(w)] \rightarrow \text{SHOULD}\neg Q(x)(w)$, for all possible values of x.
(where x is the variable of "wh-the-hell", P is the property denoted by the "wh-the-hell" phrase, and Q is the property denoted by the VP.)

So in a sentence like (602) (D&G's 36), the presupposition would be that no one should have talked to Ariadne.

(602) Who the hell talked to Ariadne?

Note that for our present purposes, this presupposition has to be seen as conflating the likelihood facts and the expressive content of "the hell". This is because when we look at other expletives, we do not find any kind of deontic judgment (e.g. involving SHOULD):[76]

[76]There are also examples with expressive content that do not express a deontic claim about the content of the question:

(i) What the hell am I supposed to do with this form?

(ii) Where the hell is Alfonso?

These express something like speaker frustration at the lack of an answer to the question, but they do not express that the speaker is not supposed to do something with the form, or that Alfonso is not supposed to be somewhere. From the expressive content in (ii), of course, we may be able to infer a deontic/bouletic claim (that Alfonso should be here already).

(603) Who on earth talked to Ariadne?

The intuition here is that the speaker thinks someone unexpected has talked to Ariadne. Correspondingly, it isn't possible to assume that the domain has been extended quite so much as D&G suggest – they widen the domain from which "who the hell" draws to the entire domain of individuals, but in cases like (603) we can see that the most likely individuals aren't considered. Therefore, domain widening in the case of "wh" expletives in general is only up to likelihood – we consider only the less likely individuals. (I assume that the boundary here is vague.) Questions involving "the hell" in particular (as well as, e.g. "the fuck") introduce an extra expressive presupposition of the kind described by D&G, given above in (601).

Given that "-ever" questions involve neither the limitations of likelihood (they do not exclude more likely possibilities), nor D&G's negative attitude presupposition, we can see that the core idea is a plausible analysis of "-ever" questions, but requires some modification. The idea I sketched at the beginning of this section is slightly different from den Dikken and Giannakidou's proposal. D&G's proposal involves what might be called *extensional domain widening* – we directly widen the set of individuals that a "wh"-item can draw from when building a question meaning. Earlier, I suggested that what we want for "-ever" questions is intensional domain widening. What is the difference, and why would we need the second?

The idea behind extensional domain widening is that we expand the individuals we consider for quantificational items. For intensional domain widening, the idea is that we expand the possibilities we consider. This will lead to a concomitant widening of the individuals we are considering as well. Thus, extensional domain widening is something like a special case of intensional domain widening. I will discuss two reasons for assuming the intensional version, one very general, and one specific to the present context.

One reason for assuming the intensional version is that a range of recent authors have argued that quantifier domains are generally mediated by a situation variable (Kratzer 1989; Recanati 1996; Kratzer 2004; Recanati 2004; Wolter 2006; Kratzer 2008). That is, an extensional domain of quantification, for any kind of operator that involves one, is determined by the situation it is interpreted relative to. Therefore, we would expect quantificational domains for "wh"-items to work the same way.

The intensional view of quantifier domains contrasts with a view where the domain of quantification for some item is provided directly by a set of individuals provided by the context or as a variable (Westerstahl 1984; von Fintel 1994; Martí 2003). Kratzer's 2004 central argument against this is that the extensional view over-predicts. An important empirical fact is that, regardless of the analysis of domain restriction, quantificational domains naturally pick up salient values from the context. For example, if I say (604):

(604) Everybody is smiling

I probably mean "everybody in the room". If I am at a bar with a group of friends, I probably don't even mean this, but rather "everybody who is with me at the bar". What Kratzer notes is that simply making a property salient is not enough to provide a domain restriction. For instance (a variant of Kratzer's example), suppose half the people in the room have red hair,

and the other half are bald. We have been discussing this remarkable coincidence for several minutes now. Suppose that all the bald people are smiling. It would be crazy in this context to utter (604). The property "bald", despite being highly salient in both the scenario and discourse, and probably completely obvious to everyone who could hear me, is not at all easily picked up as the domain of quantification for "everyone". Kratzer's general point is that the individuals grouped together in a domain have to be grouped in a very natural way – according to the natural mereological structure of the world. The people you want to discuss having some arbitrary but salient property is not sufficient to accomplish this, and this prediction is not made by the extensional theory. Any property should do. It is made by the intensional theory, as long as we are assuming that the mereological structure of the world is not completely arbitrary. (Or assuming that domains must be "natural" in the way propositions are; cf. Kratzer 1989, 2002, 2005a.)

A similar point can be made with "wh"-items. In the bar scenario, suppose that I am ordering a pitcher and ask:

(605) Who wants a glass?

It is very natural for me to mean "who among my friends wants a glass?" However, it is impossible to use just any contextual property (e.g. baldness), even if it is highly salient in both the discourse and the situation, to delimit the domain used for interpreting "who".

So, summarizing, the independent reason for assuming an intensional mechanism for domain widening is that domain manipulations in general proceed via an intensional mechanism. Let us now move to particular reasons for assuming this sort of widening with "-ever".

These questions can be used in cases where the extensional domain is fixed. The following scenario illustrates this; despite the fact that we know exactly what the extensional domain is, we can still say:

(606) Scenario: a reality show is nearing the end of its season. 5 candidates are left, and the competition is fierce. On the task for this episode, all of the competitors do extremely well. It is hard to tell who the judges will pick as the person to send home.

(607) Whoever will they pick?

(608) Who on earth will they pick?

In each case, what we mean is that each candidate is very (equally) unlikely to be sent home. In the case of the expletive question, the speaker might also be suggesting that it seems implausible that they could choose anyone at all. On a theory involving manipulation of an extensional domain, we would predict either that the questions are infelicitous in this scenario, or that the meanings of the above questions are the same as that of:

(609) Who will they pick?

Both predictions are clearly wrong. Something must be going on over and above widening of the extensional domain. Intensional domain widening, where we will be forced to consider

unlikely possibilities (i.e. unlikely possible situations) as well as likely ones, can differentiate the examples above and predict felicity in the reality show scenario. (In particular, for the "-ever" question we might consider possibilities where the judges look at really picky or strange reasons for excluding a candidate, that wouldn't otherwise be considered.)

At this point, I turn to the details of implementing intensional domain widening. I focus here on "-ever" questions, but a similar approach could be applied to expletive questions.

4.2.3 Background: questions in discourse context

In this section I state my assumptions about the pragmatics of questioning, and the interface of the Hamblin semantics with these pragmatics. The theory I use is an elaborated version of Groenendijk's 1999 Logic of Interrogation. The Logic of Interrogation is a dynamic version of the classic partition semantics for questions from Groenendijk and Stokhof 1984.

Stalnaker 1978 (see also Stalnaker 1970, 1973, 1974) introduces the notions of "common ground" and "context set". The common ground is a set of propositions representing the "mutual knowledge" of discourse participants. Here, following Gunlogson 1999, I assume that what it represents is not mutual knowledge but mutual *discourse commitments*. As I have suggested above, it is generally vague what the contents of the discourse context are. While discourse commitments that have been made explicit are not vague, there may be many that are tacit. That is, in any discourse situation, the contents of the common ground are radically under-determined by the actual discourse history. The contents are also subject to all sorts of implicit assumptions about what is relevant or likely (see §4.2.1).

The context set is commonly defined as the intersection of the propositions in the common ground – the maximal set of worlds that are compatible with the mutual discourse commitments of the speaker. Each member of the context set represents one way the actual world might be given the discourse situation. Note that while we can construct a context set straightforwardly from a common ground, it is not trivial to work backwards, because the context set does not tell us how the information it contains was grouped into propositions.

Despite the fact that the context set is a secondary notion, derived from a common ground, it is often more convenient or simpler to talk in terms of the context set. For instance, Stalnaker talks about assertions having an effect on the context set, not the common ground. In particular, they reduce the worlds in the context set, bringing discourse participants closer to agreeing on what actually is. Of course, adding the content of an assertion to the common ground will have an equivalent effect. In other cases it is also more convenient to state constraints directly on the context set. One of these is the constraints imposed by (semantic) presuppositions on context. The way Stalnaker states the idea (assuming a partial theory of presupposition) is that every world in the context set must make the content of the assertion true or false – there should be no truth-value gaps. Accommodation would involve ensuring that the context set does not contain any worlds that lead to such truth-value gaps. This process will have some effect on a common ground, but it is not trivial to reconstruct. The view I take here is that, given constraints on the context set, speakers make inferences about how the corresponding

common ground must be constrained. I leave unspecified what these inferences actually are.[77]

A notion of assertive update that operates directly on the context set is given in (610). (Some notation and definitions in this section are adapted from Farkas 2003 and Isaacs and Rawlins 2008.)

(610) **Assertive update ($\oplus$) on context sets (preliminary)**
For any context set c and proposition p
$c \oplus p \underset{\text{def}}{=} \{w \in c \mid p(w) = 1\}$

Stalnaker's work is one of the starting points of the work in dynamic semantics that has followed, and here too it is much more common to work with a context set than directly with a common ground. The account of question acts I adopt, from Groenendijk 1999, follows this trend. Where assertion reduces the context set, questioning partitions it. The cells of the partition (I will also refer to cells as alternatives) correspond to possible complete answers to the question. A following complete answer will remove all worlds in other cells, and therefore return the context set to an unpartitioned, though smaller, state.

Implementing this requires elaborating the context set to somehow represent the partitioning effect. Groenendijk does this by treating the context set not as a set of worlds, but as a set of world-pairs. These world-pairs form an equivalence relation, a symmetric and transitive (and consequently reflexive) relation on worlds. An equivalence relation is isomorphic to a partition on the worlds in the domain of the relation.[78] Worlds will be connected in this relation if they resolve the question in the same way. If the relation connects all worlds with all other worlds in the domain of the relation, then the context is uninquisitive. That is, in this case, there is only one cell in the partition. This matches the case on a Hamblin semantics where there is a singleton set. Groenendijk's dynamic move follows earlier work on questions; cf. Groenendijk and Stokhof 1984, 1990, 1997; Higginbotham 1993 for further discussion on a partition semantics. The function of an equivalence relation or partition is to capture one part of what Groenendijk and Stokhof 1997 call "Hamblin's Picture" (see discussion in chapter 3): answers to a question are exhaustive and mutually exclusive.

The effect of a question on this relation is simply to disconnect world-pairs; it cannot remove any worlds altogether. The effect of an assertion is to remove worlds altogether, eliminating any world-pairs that involve them. Definitions for these operations are given in (611) and (612):

[77] In simple cases, the easiest inference to make will simply be that the common ground contains an extra proposition corresponding to the worlds removed from the context set. These are cases where e.g. we have a presupposition that looks like a quite normal proposition, and we accommodate it. But I do not think that this is what always happens. Certain kinds of presuppositions may result in much more complex inferences, and the importing of whole sets of related premises into the common ground. The presupposition introduced by "-ever", I believe, is one of these. In fact, though the presupposition stated below does not express ignorance at all, it might be an ignorance proposition that a speaker infers must be in the common ground.

[78] An alternative dynamic approach would be to represent the partition more directly in the discourse model; see e.g. Bruce and Farkas 2007.

(611) **Assertive update ($\oplus$) on context sets**
For any context set c and proposition p:
$c \oplus p \underset{\text{def}}{=} \{\langle w_1, w_2\rangle \in c \mid p(w_1) = p(w_2) = 1\}$

(612) **Inquisitive update ($\oslash$) on contexts**
For any context c and clause ϕ:
$c \oslash p \underset{\text{def}}{=} \{\langle w_1, w_2\rangle \in c \mid p(w_1) = p(w_2)\}$

It is clear that this notion of a context set cannot be completely derived from a standard common ground, and in turn it contains information not represented in the common ground. There are two ways of solving this disconnect, if both the common ground and the context set are to be maintained. One way, which relies on the fact that partitioning always follows from some proposition corresponding to the content of a question, would be to store this proposition alongside the common ground (Bruce and Farkas 2007). This would give enough information to reconstruct the context set in a straightforward formal way. Another approach is to simply treat each as an independent entity, and state a constraint on the relationship between the two:

(613) **Constraint on context sets**
$\mathrm{Dom}(cs) = \bigcap cg$

In this interpretation, the equality is a constraint, not a definitional notion. The effect is that changes to the context set that affect its domain will cause an agent to update their common ground in a corresponding way. I assume here that there is some procedure for doing such updates, but that such effects are vague and subject to inferences based on the agents' beliefs. For instance, take the case of presupposition accommodation, which I have suggested involves changing the context set. Such changes will affect the domain of the context set, and therefore the common ground. Following Beaver 2001, this process is not a direct one, but an inferential one. According to Beaver, accommodation involves the resolution of vagueness over what the current information state is, and this is exactly what I assume is going on when changes to the domain of the context set result in changes to the common ground via the constraint in (613).

4.2.4 Analysis

In this section I build up an analysis of "-ever" questions. The idea, again, is that "-ever" introduces a presupposition that the domain of interpretation is widened up to possibility relative to the content of the clause. I begin with a discussion of what "domain" means in the context of questions and widening; I argue that it is the set of worlds or situations that are partitioned or divided into alternatives, i.e. the context set. I then turn to the implementation of "widening up to possibility". Finally, I put these pieces together and discuss the results.

The domain The first question I have raised is what exactly is the domain that is widened by "-ever". The assumptions I have made about the formal pragmatics of questioning lead directly

to a useful notion of "domain". This is the domain of the context set, which by the constraint in (613) will also always be the intersection of the propositions in the common ground. The effect of "-ever" will be to presuppose that the domain of the context set is wide, relative to the content of the clause. Because of the constraint in (613), this will trigger inferences about the state of the common ground. In particular, it will trigger the inference that the common ground must include propositions that make this domain wide in the way discussed below.

As this domain is an entirely pragmatic notion, the question now arises of what happens when a clause with "-ever" is embedded in some way. This issue is not highly relevant for questions, since "wh-ever" interrogatives are not easily embeddable. But it will return when discussing the other two "-ever" constructions, which are not root phenomena in the way that "wh-ever" questions are. Groenendijk's Logic of Interrogation does not deal with the question of what the domain is for embedded interrogatives on a dynamic analysis, but Aloni and van Rooy 2002, and in somewhat more detail, Isaacs and Rawlins 2008, do. (See also Stalnaker 1988 on the topic, independent of questions.) Basically, the idea is that instead of the context set, some epistemic (depending on the verb) conversational background is used. There is a general question as to how the context set/common ground used at the interpretation of root level speech acts relates to conversational backgrounds available in the context of interpretation; I will not address this issue here in any detail here. For the constructions and linguistic contexts discussed in this chapter, the context set will serve.

I have suggested that the extensional domain of quantification (that is, the set of individuals picked out by a "wh"-item) is entirely determined by the intensional domain. A denotation for a "wh"-item that implements this is illustrated in (615). Unfortunately this complication involves dropping the simpler denotation for a "wh"-item used by Kratzer and Shimoyama 2002; the denotation in (615) is closer to the analysis that Karttunen 1977a gave to "wh"-items (see also Lahiri 2002).[79]

(614) **Simple "wh"-item (Hamblin-style version)**
$[\![\textbf{who}]\!]^{g,c} \underset{\text{def}}{=} \{x \mid x \text{ is human}\}$

(615) **Domain-restricted "wh"-item (Karttunen-style version)**
Where α denotes a function from alternative sets of individuals to alternative sets of propositions:

$$[\![\textbf{who } [\alpha]]\!]^{g,c} \underset{\text{def}}{=} \left\{ p_{\langle st\rangle} \;\middle|\; \begin{array}{ll} & p \in [\![\alpha]\!]^{g,c}(\{x \mid x \text{ is human}\}) \\ \wedge & \exists w \in cs_c : p(w) \end{array} \right\}$$

[79] Here is a compositional version of these denotations, using the notation of chapter 3-A. Recall that × notates the meta-language analogue of the pointwise function application operation.

(i) $[\![\textbf{who}]\!]^{g,c} \underset{\text{def}}{=} \boxed{\lambda}\, x_e \,.\, x \text{ is human}$ (**Hamblin-style version**)

(ii) $[\![\textbf{who}]\!]^{g,c} \underset{\text{def}}{=} \boxed{\lambda}\, Q_{\boxed{et}\,\boxed{\langle st\rangle t}} \,.\, \boxed{\lambda}\, p_{\langle st\rangle} \,.\, \left(\begin{array}{ll} & \left(Q \times \left(\boxed{\lambda}\, y \,.\, y \text{ is human}\right)\right)(p) \\ \wedge & \exists w \in cs_c : p(w) \end{array} \right)$ (**Karttunen-style version**)

Here the argument Q corresponds to α in the non-compositional version of this denotation.

α here is a lambda-abstracted C', as discussed in chapter 3. The lambda operator takes the alternative set it is given as an argument and passes that alternative set down to be the meaning of the trace of A' movement.

To see how this works, let us consider the interpretation of the following structure:

(616) [$_{CP}$ who [λ_3 [$_{C'}$ C[iQ] [t_3 is coming to the party]]]]

The position α corresponds to the lambda operator and everything following it. The denotation of α will be:

(617) $[\![\alpha]\!]^{g,c} = \lambda X . \{p \mid \exists x \in X : p = \lambda w . x \text{ is coming to the party in } w\}$
(presuppositions omitted)

That is, it will be the kind of meaning that takes a set of individuals, and gives you back the set of propositions corresponding to each of those individuals going to the party. The meaning for the whole question will be:

(618) $[\![\textbf{who } [\alpha]]\!]^{g,c} =$

$$\left\{ p \;\middle|\; \begin{array}{ll} & \exists x \in \{y \mid y \text{ is human}\} : p = \lambda w . x \text{ is coming to the party in } w \\ \wedge & \exists w \in cs_c : p(w) \end{array} \right\}$$

(presuppositions omitted)

This is the set of propositions of someone coming to the party, such that each of the propositions is non-empty relative to the context set. It is this second clause that the more complicated definitions here add to the compositional Hamblin denotation from Kratzer and Shimoyama 2002. Like Karttunen 1977a, the denotation must be more complicated because we need to directly refer to the set of propositions we are building; the simpler individual-set version cannot do this. The distinction plays out primarily in the order of composition. The new version takes its sister as an argument, where as the old version is taken as an argument to its sister.

Remote possibility With an ordering or premise semantics for modals (Lewis 1973; Kratzer 1977, 1981; Lewis 1981; Kratzer 1991), the idea of "remote possibility" turns out to be quite simple. An ordering semantics provides the tools to look at the closest worlds to some index. For instance, in a deontic sentence like "You shouldn't pass on the right", we look at the deontically ideal worlds (i.e. worlds where all the laws are true) that are closest to the actual world, and check whether people pass (other cars) in the right-hand lane. We could not look at the actual world (or worlds compatible with what is known about the actual world) because people pass on the right all the time, and so we would find the empty set.

On this kind of framework, what we want to ensure for the idea of "remote" possibility is that we look at worlds that are far from the actual one. On an ordering semantics we typically start with a fairly wide-open modal base, and then use an ordering source to zoom in on worlds in that modal base that are closest to some ideal. We want to do the opposite of that. Kratzer 1981 formulates "slight possibility" in the following way:

(619) **Slight possibility**
A proposition p is a slight possibility in a world w with respect to a modal base f and an ordering source g if, and only if,

(i) p is compatible with $f(w)$

(ii) the negation of p is a human necessity in w with respect to f and g.

A human necessity is something that is true, roughly, in all the closest worlds defined by the ideal (the ordering source g). If a proposition is a slight possibility it is very likely that it is not true, but it is possible, if the worlds we look at differ substantially from the ideal. Here is Kratzer's technical definition of human necessity, along with the subsidiary ordering relation on worlds: (I have given Kratzer's original definition here, instead of the modified version used in chapter 3.)

(620) **Ordering of worlds** ($\leq_A$)
For all worlds w and $z \in \mathcal{W}$:
$w \leq_A z$ if and only if $\{p : p \in A \text{ and } z \in p\} \subseteq \{p : p \in A \text{ and } w \in p\}$

(621) **Human necessity**
A proposition p is a human necessity in a world w with respect to a modal base f and an ordering source g if, and only if, the following condition is fulfilled:
For all $u \in \bigcap f(w)$ there is a $v \in \bigcap f(w)$ such that
(i) $v \leq_{g(w)} u$
and
(ii) for all $z \in \bigcap f(w)$: if $z \leq_{g(w)} v$, then $z \in p$

(Note that Kratzer 1991 defines slight possibility in a different way; that version is weaker. There, proposition is a slight possibility if it is possible, and its negation is a better possibility than it is. I am not sure that this definition captures the intuition behind "slight", or gets us possibilities as remote as we need for present purposes.)

In the case of "wh-ever" questions we do not want to consider *only* the slight possibilities; we want to consider *even* the slight possibilities. That is, domain widening forces us to include worlds in the domain relative to which the content of the clause is a slight possibility, but also worlds relative to which it is more likely. Because of this, in the technical definition, we can actually use a very simple notion of possibility – plain compatibility.

(622) *Wideness*
A set of worlds D is WIDE relative to a set of propositions Q and a modal base f iff:
$D \supseteq \{w \mid \exists p \in Q : p \text{ is compatible with } f(w)\}$

Roughly, this definition says that the domain D most include as many worlds as possible that make some proposition in the alternative set a remote possibility. It does not require that every proposition be a remote possibility; in fact we will see below that there will be many propositions that aren't. But for every proposition that is, any world that makes it so will be a part of the domain.

This notion of wideness is intuitively like a sort of wedge that holds the domain open along a certain set of alternatives. It is not a procedural notion of widening. That is, we do not take a domain that is narrow in some way and widen it. Rather, the domain is prevented from implicitly narrowing to exclude worlds that make some alternative a possibility, no matter how unlikely that possibility.

The definition of widening is relativized in two ways. The first is that it is only widening relative to some particular set of propositions. The second is that it is wide only relative to some particular modal base. I will use this definition in the context of "wh-ever" questions shortly, specifying both of these parameters. The alternative set will be the question meaning, and the modal base will be the speaker's epistemic background.

Content of the clause The notion of widening in (622) is relativized to a set of propositions that determines the direction of widening. Really, what it does is determine a way in which narrowing is prevented. Intuitively for a "wh-ever" question this set should correspond to the content of the clause. The question now is how to make this compositionally so, given that "-ever" appears to be an affix to a "wh"-item. The modification of the semantics of "wh"-items in previous sections makes this possible. In a compositional Hamblin semantics a "wh"-item is an argument to its sister, and has no access to the resulting alternative set, but in a Karttunen style approach to "wh"-items, the "wh"-item takes its sister as an argument, and therefore does have access to the resulting alternative set.

The definition of wideness in (622) above will form the core of the denotation for "-ever". The assumptions I have outlined here serve to allow the Q parameter of this definition to be directly filled in compositionally.

Putting together the analysis This section uses the pieces developed above to give a meaning for "-ever" that modifies a "wh"-item, introducing a widening presupposition. Recall the denotation for a "wh"-item, repeated from above:

(615) **Domain-restricted "wh"-item (Karttunen-style version)**
Where α denotes a function from alternative sets of individuals to alternative sets of propositions:

$$[\![\textbf{who } [\alpha]]\!]^{g,c} = \underset{\text{def}}{\left\{ p_{\langle st \rangle} \;\middle|\; \begin{array}{ll} & p \in [\![\alpha]\!]^{g,c}\left(\{x \mid x \text{ is human}\}\right) \\ \wedge & \exists w \in cs_c : p(w) \end{array} \right\}}$$

We can now defined the meaning of "-ever" syncategorematically as follows:[80]

(623) **Denotation for "-ever"**

[80] Here is sketch of a compositional version in the type system of appendix 3-A. The situation is complicated somewhat by the fact that the meaning of "-ever" must apply before the domain closure operation in "who" (to prevent circularity), but after the operation that applies the set of people to Q (to get the right set for widening). I accomplish this by separating out the domain closure operation into a separate operator. One way of construing this separation is that "wh-ever" items are more internally complex than we might think; the core would be simply the lexical restriction imposed by the particular "wh"-item. The structure would be: [DomClose [[wh-] -ever]].

Where α denotes a function from alternative sets of individuals to alternative sets of propositions:

$$[\![\textbf{who-ever}\ [\alpha]]\!]^{g,c} = \left\{ p_{\langle st\rangle} \;\middle|\; \begin{array}{ll} & p \in [\![\alpha]\!]^{g,c}(\{x \mid x \text{ is human}\}) \\ \wedge & \exists w \in cs_c : p(w) \end{array} \right\}$$

defined only if cs_c is WIDE relative to $[\![\alpha]\!]^{g,c}(\{x \mid x \text{ is human}\})$ and g_c
where g_c is a contextually provided epistemic background.

The role of the epistemic background, and the reason for the choice of an epistemic background in particular, is to allow widening only up to the known facts according to the speaker. Widening applies to the context set, which represents public knowledge or beliefs, but is based on an epistemic background representing private knowledge. A speaker of an "-ever" question introduces a presupposition about the public beliefs, that they should match the widest interpretation of their private beliefs on the issue corresponding to the question. (In the next section I explore this in more detail.)

How does a static Hamblin meaning as given here interact with the dynamics of root-level questions? An answer is necessary to complete the link with a Groenendijk 1999-style analysis sketch in §4.2.3, and to make the widening I have described above have any effect. Another way of putting it is that we need an account of how domain widening in the semantics affects the pragmatics of a root question.

What I will assume, without being specific about how the compositional details work, is that a root question is converted into a context change potential in the Logic of Interrogation form. This is straightforward to state in a syncategorematic way (cf. Kratzer and Shimoyama's 2002 G&S version of the question operator; (iv) in section 3):

(i) $[\![\textbf{who}]\!]^{g,c} \underset{\text{def}}{=} \boxed{\lambda}\, Q_{\boxed{et}\,\boxed{\langle st\rangle t}} \,.\, \boxed{\lambda}\, p_{\langle st\rangle} \,.\, \Big(\big(Q \times \big(\boxed{\lambda}\, y \,.\, y \text{ is human}\big)\big)(p)\Big)$

(ii) $[\![\textbf{-ever}]\!]^{g,c} \underset{\text{def}}{=} \boxed{\lambda}\, I_{\boxed{et}\,\boxed{\langle st\rangle t}\,\boxed{\langle st\rangle t}} \,.\, \boxed{\lambda}\, Q_{\boxed{et}\,\boxed{\langle st\rangle t}} \,.\, \boxed{\lambda}\, p_{\langle st\rangle} \,.\, I(Q)(p)$

defined only if cs_c is WIDE relative to $I(Q)$ and g_c
where g_c is a contextually provided epistemic background.

(iii) $[\![\textsc{DomClose}]\!]^{g,c} \underset{\text{def}}{=} \boxed{\lambda}\, I_{\boxed{et}\,\boxed{\langle st\rangle t}\,\boxed{\langle st\rangle t}} \,.\, \boxed{\lambda}\, Q_{\boxed{et}\,\boxed{\langle st\rangle t}} \,.\, \boxed{\lambda}\, p_{\langle st\rangle} \,.\, \left(\begin{array}{ll} & I(Q)(p) \\ \wedge & \exists w \in cs_c : p(w) \end{array} \right)$

Both "-ever" and DOMCLOSE act as modifiers of the type of "wh"-items, each introducing a new restriction.

A different way to solve this ordering problem would be to state the presupposition of "-ever" as a presupposition on C. This is one way of construing the feature system I developed in chapter 2 as an account of the morphosyntax of "-ever"; we could make the feature on C interpretable, and assign it an interpretation corresponding to the denotation I have given here. This would allow us not to separate out the domain closure operation. However, it is not clear that this approach is generally extendable to expletive questions, where we would need a similar semantics.

Note that this domain closure operation has to be specific to constituent questions. If it weren't, in an alternative or polar question we would be able to felicitously drop alternatives from consideration that aren't compatible with the context set.

(624) where α is a root interrogative, and c a context,
$cs_c + \alpha \underset{\text{def}}{=} \{\langle w_1, w_2\rangle \in cs_c \,|\, \forall p \in [\![\alpha]\!]^{g,c} : (p(w_1) = p(w_2))\}$

The dynamic effect of a root interrogative is to partition the context set along the lines of the issues determined by the alternative set involved. That is, it removes any world-pairs where the first world makes a different alternative true than the second world. Because of exhaustivity and mutual exclusivity, this guarantees a partition. The widening presupposition will of course project to become a presupposition about the input context set, and therefore a "wh-ever" interrogative's context change potential will only be defined for input contexts that are wide in the appropriate way.

Discussion Let me repeat this point as a principle:

(625) **Interpretive principle for root "wh-ever" questions**
A "wh-ever" interrogative's context change potential will only be defined for input contexts that are wide in the appropriate way.

In the previous sections I have shown how to derive this principle in a compositional way; the question now is what follows from this principle.

What I have claimed is really that "-ever" blocks narrowing of the intensional domain of interpretation; it blocks it along the "dimension" indicated by the alternative set. This is not widening per se, but because it is a presupposition, it may be accommodated. The consequence of accommodating this presupposition will be to accept that the context set is wide, relative to the content of the question and the speaker's beliefs. In scenarios where this would be accommodated, it will not be that the context set was previously narrow. Rather, the context set and common ground under-determined whether the domain was narrow or wide, and the presupposition forces a resolution of this particular under-determination. Prior to this accommodation, the default would have been to exclude less likely possibilities, but now this is explicitly impossible. This kind of accommodation fits well with the notion of accommodation in Beaver 2001, where accommodation in general is treated as the resolution of indeterminacy as to the state of the context.

A consequence of accommodating contexts of this kind (or, more generally, of taking the context to be one that satisfies the wideness presupposition) is that we will ensure the context set also contains those worlds in which the proposition is a remote possibility. This is simply a consequence of the speaker committing themselves publicly to the proposition being true in worlds that are remote, as far as they know. To the extent such worlds are compatible with other propositions in the common ground, they will have to be part of the context set.

I have suggested here that domain widening is purely intensional, and that contextual domain restriction is also intensional. The meaning of a "wh"-item takes its domain directly from the context set – it prevents us from considering any alternatives that are not live options in the context set. Consequently, a presupposition that widens the context set will also widen the set of alternatives that are considered, and therefore the set of individuals we might be

considering. Of course it is not required that the set of individuals be increased, if what is possible constrains this.

It is this indirectness that allows the analysis to capture examples (such as the reality show example in §4.2.2) where the domain of individuals is manifestly stable, but we seem to consider more remote possibilities. The nature of such examples force us to consider only possible worlds where one of the constrained extensional options is the correct one. Therefore, regardless of whether there is an "-ever" in the question, the extensional domain derived will be the same. But the cells in the partition that correspond to the extensional options will not (necessarily) be the same. With the "-ever" question we are guaranteed to include worlds in each cell which correspond to very unlikely possibilities. With the plain question, there are no such guarantees, and the default will be to not include such worlds.

4.2.5 "-ever" questions and bias

The notion of bias has received much attention in recent literature on questions; here I want to describe some ways in which "-ever" questions fit into this literature.

A question involving "-ever" will be unbiased in a certain way. Where normally, we may make all kinds of implicit assumptions about what worlds are reasonable possibilities, this kind of question does not allow that. This is where the sense of speaker ignorance comes from; the speaker presupposes that even the least likely possibilities may be relevant to answering the question. So we have to consider even the least likely possibilities for every cell in the partition induced by the question. What I suggest is that this inclusion of the least likely case results in speakers viewing each cell as equally weighted, relative to what is possible. That is, a bias towards one cell would involve the cell being composed of possibilities that were more likely than those in other cells. The widening presupposition will result in all cells having the same (relative) lower bound – worlds that in the normal course of things would most likely not even be accessible due to improbability.

van Rooy and Safarova 2003 discuss the bias of questions in terms of the "utility values" of possible answers. The utility value is a numerical measure of how well an answer helps to accomplish some (contextually determined) goal. A question is biased if one of the answers has a greater utility value than others. Let us focus on what for van Rooy and Safarova is a special case: the goal of finding out what the world is like. Because each cell is equally weighted (in the sense described above), the utility values of the cells with respect to this goal would all be equal. In this sense, the bias in "-ever" questions is quite similar to the bias in alternative questions (see later in this chapter for discussion).

A related way of conceiving of bias (Ladusaw 2004) is that biased questions convey that the speaker is disposed towards certain resolutions of an issue. On this view, "-ever" questions are completely unbiased, in that they indicate that the speaker has no disposition towards any particular resolution, and in fact is quite ignorant.

In many analyses (and in many kinds of biased questions), the distinction between a biased and unbiased case is much "stronger" than what we find here. That is, for Gunlogson 1999; Guerzoni 2003; Asher and Reese 2005; Reese 2007, a case of a question with bias involves

either the commitment of a discourse participant (Gunlogson 1999 and Reese 2007 in different ways) or a semantic presupposition of one of their answers (Guerzoni 2003). There is a sense in which plain constituent questions are more biased than "-ever" questions, but they are not nearly so biased as kinds of question discussed as real biased questions in the literature. It is simply that there is a default inference that the domain of possible answers includes only the likely or relevant possibilities (see §4.2.1). This means that relative to what an "-ever" question forces, the default partition induced by a plain constituent question (in a context that does not severely restrict answers already) covers a smaller set of more likely answers. But the speaker is not committed per se to any of these answers, or even their aggregate, and there is no presupposition that we are considering only likely possibilities.[81]

4.3 "-ever" in unconditionals

In chapter 3 I made very simplistic assumptions about the domains of quantification involved in constituent unconditionals. I assumed, in particular, that the domain used to form the set of alternative individuals denoted by an interrogative pronoun was the entire domain of individuals (that are compatible with the presuppositions of the pronoun). That is, I made the assumption that the domain was extended or widened in the sense of den Dikken and Giannakidou's 2002 analysis of expletive questions. Furthermore, I did not make any explicit assumptions about the intensional domain of quantification. Because chapter 3 focused on examples involving the future, there was little need to challenge these assumptions:

(626) Whoever comes to the party, it will be fun.

In examples of this kind, it makes sense to think of the domain of individuals as quite large and without much explicit limitation (though perhaps not the *entire* set of individuals). The amount of fun at the party, according to (626), is independent of the choice of attendees, and considering any remotely possible attendee expresses this. Because of this wide extensional domain, one does not need to worry much about the intensional domain, which will be correspondingly wide.

However, there are many examples of constituent unconditionals where these assumptions fail. Once we move beyond the future, we find cases where the domain of individuals is precisely delimited:

(627) (Suppose that Alfonso met with every colloquium speaker about his research this quarter.) Whoever Alfonso met with, he had an interesting discussion.

Here it is quite clear that we can't quantify over the entire set of individuals. If we did, the truth conditions of the sentence would be wrong. The speaker is only quantifying over those people who Alfonso actually did meet with. The analysis in chapter 3, with a completely wide

[81] However, strongly D-linked "wh"-phrases might work differently. Cf. discussion in den Dikken and Giannakidou 2002.

domain used for the interpretation of "whoever", makes the wrong prediction about this kind of sentence. We should derive one conditional claim for every member of the domain x – paraphrasable as "if Alfonso met with x, he had an interesting discussion." This is much too strong. For example, we do not want (627) to be making claims about Heraclitus, or Margaret Thatcher, who are clearly not people Alfonso met with, and may well have not led to interesting discussions. (In fact, we do not consider everyone when evaluating sentences like (626) above, e.g. people who are already dead.)

An obvious possibility is to consider only true alternatives. This would eliminate e.g. the Margaret Thatcher alternative for unconditionals like (627). However, considering only true alternatives doesn't extend to the future examples, such as (626) above. The true alternatives are probably not yet known, and even if it were certain, we do not want to consider only the people who actually will come to the party, but anyone who might attend. What we want to ensure is that we do not make the domain so wide as to consider possibilities that are obviously false. That is, once again, we want *widening up to possibility*.

There is a closely related puzzle about past unconditionals that I will refer to as the *single occasion puzzle*. In an example like (627) above, the speaker is quantifying over multiple occasions. The sentence is compatible with the speaker not knowing the identity of any or all meetees, and it is also compatible with the speaker knowing the identity of all of them. However, once we change the context so that the antecedent picks out just one occasion, things change. This kind of sentence is only compatible with the speaker not knowing the identity of the meetee. (This fact is analogous to the fact that root "-ever" questions have to involve an ignorance implication.)

(628) (Suppose that Alfonso met with someone yesterday about his research, and tells you about what he learned. You say to someone else:) Whoever Alfonso met with, he got good advice.

That is, we are forced to an ignorance reading. The puzzle is that the obligatory presence of an ignorance interpretation for unconditionals is linked to the number of occasions being quantified over. Interestingly, this puzzle replicates in "-ever" free relatives:

(629) (Suppose that Alfonso met with every colloquium speaker about his research this quarter.) Whoever Alfonso met with gave him good advice.

(630) (Suppose that Alfonso met with someone yesterday about his research, and tells you about what he learned. You say to someone else:) Whoever Alfonso met with gave him good advice.

In (629), the sentence is compatible with the speaker knowing or not knowing exactly who Alfonso met with. This reading is what has variously been called a quantificational or free choice reading. But (630) is only compatible with an ignorance reading, where the speaker does not know who Alfonso met with. The ignorance/quantificational distinction (not to mention FR-indifference readings) has triggered a substantial amount of research in understanding what a

unified analysis of "-ever" free relatives would look like (Dayal 1997; von Fintel 2000; Condoravdi 2005; Tredinnick 2005). The facts underlying the single occasion puzzle are due to Reynolds 2007, who observes that ignorance is tied to episodicity. This puzzle gets to the core of the ambiguity problem. The fact that the puzzle appears in both free relatives and unconditionals, two construction that I have argued in chapter 2 are quite different syntactically, suggests not only that we need a unified solution to the puzzle, but that the unified analysis must center around "-ever" in particular. This morpheme is the common denominator of unconditionals and free relatives.

My proposal will be that the solution follows from the interaction of widening and the interpretation of interrogative clauses. In particular, questions involve a post-update constraint that their alternative set is not trivial relative to the context set. The fact that we are stuck with a single occasion forces us to examine alternatives to that occasion, and the widening presupposition leads to examining epistemic alternatives.

4.3.1 Unconditionals and domain widening

The analysis developed in the previous section can be applied directly to unconditionals with very little modification; on the analysis in chapter 3, unconditional adjuncts are literally questions. There is one thing that we must explore further – the issue of what domain is widened. In the case of root "-ever" questions I argued that the relevant domain is the context set. This is because the interpretive effect of a root question is to partition the context set (Groenendijk 1999). However, this is not the effect of an adjoined "-ever" question, so we must consider further. The situation is more complex because whatever domain is involved has to also interact with the conditional meaning in some way.

Conveniently, I have suggested in the previous chapter (following Isaacs and Rawlins 2008 and much work in dynamic semantics) that the domain of interpretation for a modal is constrained by the context set. Consequently, applying intensional widening up to possibility to the context set can work for (root) unconditionals as well. Consider again the familiar example from chapter 3:

(631) Whoever comes to the party, it should be fun.

The effect of "-ever" in this example is to presuppose that the context set is wide enough that we are considering even the most remote possibilities where someone comes to the party, so long as they are possible. Interpretation of the modal happens against a domain constrained by the context set, and so we will only consider domain restrictions in this set. Therefore, we will in turn only consider the domain of individuals used in interpreting "who" to contain even the least likely possible individuals who might come to the party.

4.3.2 The single occasion puzzle

A domain widening analysis, in combination with one additional constraint, can provide the solution to the single occasion puzzle. The additional constraint we need is that the alternative

set involved in interpretation of the unconditional is not a singleton set (following Beck and Kim 2006 ex. 84). I will assume that this additional constraint comes from the meaning of a question in a Hamblin semantics. In the context of a compositional Hamblin semantics for questions, this is an extremely natural and perhaps even necessary assumption. It is necessary because we need to preserve the distinction between questions and assertions, and the singleton/non-singleton distinction provides this distinction in the Hamblin framework.[82]

Consider first the case where the antecedent picks out only a single occasion – an episodic case.

(628) (Suppose that Alfonso met with someone yesterday about his research, and tells you about what he learned. You say to someone else:) Whoever Alfonso met with, he got good advice.

Here, the past tense is referential and singles out the occasion of one particular meeting event, and so it cannot vary with the quantificational force of the unconditional. The constraint against singleton denotations for the antecedent prevents us from having only one alternative proposition. Therefore, we must consider more than one individual. Extensional domain widening forces us to have a context set that is wide with respect to the possibility of Alfonso meeting with someone. Since there is only one occasion, the only way we can widen without going to impossible worlds/situations is to look at alternative people Alfonso might have met with on that occasion. Therefore, the combination of episodicity, widening and a non-singleton alternative will in total amount to a presupposition that the context set is compatible with a wide range of possible identities for the person Alfonso met with.

This non-singleton constraint corresponds with what von Fintel 2000 referred to as the variation presupposition of Dayal 1997 – that there are at least two distinct i-alternatives. Dayal attributes the presupposition to the meaning of "-ever", in contrast to what I have suggested here. Von Fintel (followed by Condoravdi 2005 and Tredinnick 2005) argues that this variation presupposition is not strong enough to account for the quantificational force of an "-ever" free relative. Here I am not using it to induce the appearance of universal quantification, however. I am using it as a sort of minimality constraint on quantification. The fact that unconditionals are quantificational in the first place is derived from the fact that they denote alternative sets, in combination with domain widening. The non-singleton constraint simply prevents this quantification from being non-trivial.

The other half of the puzzle is multi-occasion sentences. Here there is no problem about finding multiple alternatives – there is one for each occasion. We still widen, but if the limitations of what is possible prevent us, we do not need to widen beyond what alternatives may already be specified by the context set. Of course, if the context set allows it, we can do such widening. Therefore, multi-occasion unconditionals are compatible with either ignorance or non-ignorance, depending on what context allows.

[82] One case where this denotation for a question has been proposed is the issue of rhetorical questions.

4.3.3 i-alternatives reconstructed

In my analysis of unconditionals I have not employed any theoretical notion corresponding to Dayal's i-alternatives. However, from the interaction of the many different elements involved in the meaning of an unconditional, the notion of an i-alternative can be reconstructed. In fact, Dayal's i-alternatives look much like Hamblin alternatives. An important distinction is that for Dayal, an i-alternative is a single world, but in the Hamblin analysis, an alternative is a set of worlds. But as Condoravdi 2005 points out, what the set of i-alternatives on Dayal's analysis really amounts to is a partition on the set of worlds (i.e. an equivalence relation), where each cell of the partition resolves the identity of the free relative in a different way. The identity of the referent of the "wh"-item is exactly what individuates the alternatives involved in the denotation of an unconditional adjunct. The equivalent of Dayal's variation presupposition, I have suggested, follows from a constraint on the semantics of questions. The equivalent of the universal quantification over i-alternatives follows from the presence of a default Hamblin $\forall$ operator in the LF of an unconditional. The modality, when there is modality involved, follows from the domain widening introduced by "-ever".

4.4 "-ever" in free relatives

In this section I sketch the extension of my proposal for the semantics of "-ever" to free relatives. The goal of this section is to give the general idea, and I will not do justice to all the issues that have been raised in the literature on "-ever" free relatives. The basic idea, again, is that "-ever" contributes a presupposition of domain widening of a certain type. In extending this to free relatives, I am following an idea which Jacobson 1995 attributes to John Richardson, as well as the suggestion by Horn 2000b that "-ever" free relatives have an "indiscriminative" or "quodlibetic" meaning.

I have argued earlier in this chapter that "indifference" readings (FR-indifference) are a different species of reading than the ignorance and quantificational readings. They arise in a range of kinds of DPs, as long as those DPs can have an attributive reading. Adverbs like "just" that generally force attributive readings support this claim. Because I have argued that FR-indifference readings are not really tied to "-ever", I will not address them in this chapter. However, it is clear that we would still need to explain how my account of "-ever" fits in with FR-indifference. I will leave this for the future.

The other two kinds of readings, on the other hand, are more general, and they are the main targets of my analysis.

4.4.1 Free relatives as definites

Following Jacobson 1995 (as well as must later authors, e.g. Dayal 1997; von Fintel 2000; Caponigro 2003; Tredinnick 2005) I take free relatives to have the external semantics of definite descriptions. The intuition behind this idea can be expressed by paraphrase relationships:

(632) Alfonso talked to who Joanna did.

(633) Alfonso talked to the person(s) who Joanna talked to.

There are many puzzles this idea raises that I will not deal with, having to do with ways in which "-ever" free relatives pattern with universals, indefinites, and free choice constructions. See Dayal 1997; Horn 2000b; Condoravdi 2005; Tredinnick 2005 for further discussion.

To derive the semantics of a definite description, Caponigro 2003 proposes that a free relative denotes a property, and that this property is converted into type e by an operation δ that returns the maximal sum of entities (in the sense of Link 1983) that make a property true. Caponigro treats this as a type-shift, similar to Partee's 1986 definite type-shift ι. Effectively, this operator has the semantics of a definite article.[83]

To derive a property interpretation for the free relative (minus the type-shift), Caponigro makes a different assumption about the interpretation of "wh"-items than is standard in the literature on questions. (See Caponigro 2003 ch. 6 for discussion.) The assumption is that the function of a "wh"-word is to further restrict a property that it combines with: (translated into my notation)

(634) $[\![\textbf{who}]\!] \underset{\text{def}}{=} \lambda P_{\langle et \rangle} . \lambda x_e . \text{human}(x) \wedge P(x)$ (Caponigro 2003 version)

Crucially, for Caponigro, the meaning of a "wh"-phrase does not saturate the denotation of the constituent it combines with. The reason that this is crucial is that the type-shift needs an unsaturated property in order to produce the right meaning. Otherwise, the necessary assumptions about the internal structure of the clause are effectively the same as the assumptions I have made earlier in this dissertation; a trace corresponds to a variable, and a lambda operator taking scope over the clause but under the "wh"-pronoun binds this variable at LF. The constituent headed by the lambda operator is what the "wh"-phrase composes with.

A simplified version of a derivation of a FR denotation in this system is given in (635).

(635) a. $[\![[\lambda_1$ [**Mary talked to** t_1]]$]\!] = \lambda x_e$. Mary talked to x

b. $[\![$**who** $[\lambda_1$ [**Mary talked to** t_1]]$]\!] = \lambda x_e$. human$(x) \wedge$ Mary talked to x

c. $[\![\delta$ [**who** $[\lambda_1$ [**Mary talked to** t_1]]]$]\!] =$
The maximal individual x such that human$(x) \wedge$ Mary talked to x

The assumptions about "wh"-items are of course somewhat different than what I have assumed here; following much work in the semantics of questions in the Hamblin tradition, in chapter 3 I took interrogative pronouns to denote alternative sets. In this tradition, these sets do saturate the property they combine with. A saturating analysis of A'-moved "wh"-items is obviously going to make it quite difficult to later apply a definite operator of any kind, as a definite operator needs an unsaturated type. In this chapter I have introduced a more complex analysis, following Karttunen 1977a, but this denotation also saturates its sister.

Caponigro 2003 proposes to unify the two cases by disassociating that property of saturation (and existential quantification) from the "wh"-items, and move it into a higher operator

[83] An alternate way of construing this analysis, alluded to by Caponigro's occasionally describing δ as a lexical item, is as simply a covert definite operator.

"?". For a straightforward extension of my analysis of "-ever" to free relatives, Caponigro's unification won't work. The reason is that there are no alternatives (in the broad sense inspired by Hamblin) in his semantics until composition with this operator. If this operator is construed as a source of alternatives (e.g. as a Q operator), there won't be any at all in a free relative, as this operator isn't present. The denotation for "-ever" used above relies on an alternative set.[84]

As a place-holder for a full understanding of the compositional relationship between free relatives and interrogatives, I give a non-compositional analysis of free relatives here. (This kind of assumption is not new in the literature on free relatives.) The main focus of this section is on deriving the various readings.

However, I do assume an analysis where almost every step is transparent. The idea is to turn an alternative-set denotation into a property by checking for the existence of certain propositions in the alternative set. I will assume that a free relative's C contains a feature iFR that has the same semantics as iQ.[85] As usual, "-ever" contributes a presupposition that the domain is wide relative to that alternative set. Thus the meaning of the C' node is the same as in the rest of this chapter: an exhaustive set of mutually exclusive propositions. I then assume that this is converted into a property:[86]

(636) Let $A = \{p \mid \exists y \in \{z \mid z \text{ is human}\} : p = \lambda w'_s \,.\, \text{Joanna talked to } y \text{ in } w'\}$
$[\![[\textbf{who-ever } [\lambda_1 \; [\textbf{C[iFR] Joanna talked to } t_1]]]]\!]^{g,c} =$
$\left\{\lambda x_e \,.\, \lambda w_s \,.\, \exists p \in \left\{p' \;\middle|\; \begin{array}{ll} & p' \in A \\ \wedge & \exists w' \in cs_c : p'(w') \end{array}\right\} : p(w) \wedge p = \lambda w'_s \,.\, \text{Joanna talked to } x \text{ in } w'\right\}$
defined only if (i) $\text{Exh}_{cs_c}(A) = 1$
(ii) $\text{MutExcl}_{cs_c}(A) = 1$
(iii) cs_c is WIDE relative to A and g_c
(where g_c is the speaker's epistemic background.)

Given this denotation, we can straightforwardly apply Caponigro's 2003 δ operator, to get the maximal sum of individuals that Mary talked to:

(637) Let $A = \{p \mid \exists y \in \{z \mid z \text{ is human}\} : p = \lambda w'_s \,.\, \text{Joanna talked to } y \text{ in } w'\}$
$[\![\delta \; [\textbf{whoever } [\lambda_1 \; [\textbf{C[iQ] Joanna talked to } t_1]]]]\!]^{g,c} =$

[84] This is not to say that there is no way to combine Caponigro's unification of free relatives and questions with a version of my proposal for "-ever", just that it is not obvious how to do it at this point.

[85] An alternative possibility is that there is literally a question operator, or that both constructions share some operator that is not specific to either. It should be kept in mind that the tests in chapter 2 show that there is a real, substantive, difference between the two constructions, though, and a different complementizer provides a place to encode some of these distinctions.

[86] The reason why this isn't easy to accomplish compositionally is because of the presuppositions on C. A new denotation for a "wh"-item that built this kind of meaning would have to somehow bypass the presuppositions in order to find the right form for the proposition to check against the alternative set. That is, if we pass down singleton sets to the C', we don't want the Q operator's presuppositions to project relative to these sets.

$$\left\{ \begin{array}{l} \lambda w'_s \text{. the maximal sum of individuals } x \text{ s.t.} \\ \qquad \left(\exists p \in \left\{ p' \,\middle|\, \begin{array}{ll} & p' \in A \\ \wedge & \exists w'' \in cs_c : p'(w'') \end{array} \right\} : \right. \\ \qquad\qquad \left. p(w') \wedge p = \lambda w''_s \text{. Joanna talked to } x \text{ in } w'' \right) \end{array} \right\}$$

defined only if (i) $\text{Exh}_{cs_c}(A) = 1$
(ii) $\text{MutExcl}_{cs_c}(A) = 1$
(iii) cs_c is WIDE relative to A and g_c
(where g_c is the speaker's epistemic background.)

The type of the denotation of an "-ever" free relative here is an individual concept (⟨se⟩). The world variable will be bound by the complete proposition's lambda abstractor over possible worlds, since, to find if a proposition containing a free relative is true at a world, we need to find those individuals that were actually talked to by Mary in that world. In leaving this world argument open I follow Giannakidou and Cheng 2006; Cheng and Giannakidou to appear most directly. This clause, through a somewhat indirect route, denotes for a world w' the maximal set of people who Joanna talked to in w'. The wideness presupposition forces us to assume that the context set gives us access to worlds where Joanna talked to someone unlikely.

4.4.2 Free relatives in context

To understand how this denotation works, we need to look at it in context. First, the complete denotation of a sentence containing the above free relative:

(638) Let $A = \{p \,|\, \exists y \in \{z \,|\, z \text{ is human}\} : p = \lambda w'_s \text{. Mary talked to } y \text{ in } w'\}$
$[\![\textbf{Alfonso talked to whoever Joanna talked to}]\!]^{g,c} = \{\lambda w'_s \text{. Alfonso talked to } x \text{ in w'}\}$
where x is the maximal sum of individuals y s.t.

$$\left(\exists p \in \left\{ p' \,\middle|\, \begin{array}{ll} & p' \in A \\ \wedge & \exists w'' \in cs_c : p'(w'') \end{array} \right\} : \right. \\ \left. p(w') \wedge p = \lambda w''_s \text{. Joanna talked to } y \text{ in } w'' \right)$$

(Presuppositions as above)

(I abstract away from a compositional treatment of the episodic/non-episodic distinction in free relatives; see Tredinnick 2005 for a worked out version. Following Tredinnick, I assume that this distinction arises via the presence or absence of a covert Gen operator binding world variables, and leading to a distributivity effect w.r.t. the argument x in the above formula. But I will simplify and not represent this in the formulas.)

This denotation then gets used as an assertion in context. I assume that the function of an assertion is to reduce the context set, following Stalnaker 1978 (see discussion earlier in this chapter). In general (cf. (610) earlier):

(639) **Assertive update**
For any context c, context set cs_c and clause α:
$cs_c + [\text{Assert } \alpha] \underset{\text{def}}{=} \{w \in cs_c \mid [\![\alpha]\!]^{g,c}(w)\}$

The consequence is that an assertion removes worlds from the context set where α is not true. In this case, the worlds that will be removed are worlds where Alfonso talks to someone different than Joanna talked to. Worlds will remain in the context set where Alfonso and Joanna talked to the same person(s), regardless of their identity.

What the wideness presupposition guarantees is that, of the worlds that are left, even worlds that are only present in some remotely possible alternative will be present. On contexts that are compatible with the speaker not knowing the identity of the referent, this will tend to lead to an ignorance effect. On contexts where the speaker does know all or many of the referents, we get more of a quantificational reading. To see this, consider Dayal's 1997 example in (640).

(640) There's a lot of violence in whatever Parker writes.

On this example in a typical context, the overall claim wouldn't really make sense in a context where the speaker does not have some reasonable knowledge of the things Parker writes. This follows from part of Grice's maxim of quality: say only what you have evidence for. If the speaker didn't know what Parker writes, they probably wouldn't have evidence to make claims about its contents. Consequently, when the domain is widened to the limits of the speaker's knowledge, we do not get an ignorance reading. However, if we change the sentence to one that is plausibly compatible with a scenario where the speaker does not know what the referents are, we find that an ignorance reading becomes salient. For example, take the sentence in (641) in a scenario where a counselor is evaluating Parker's file, and trying to explain why he is so angry.

(641) There's a lot of violence in whatever Parker watches on TV.

In this scenario, the context is compatible with the speaker having no knowledge of what it is that Parker watches on TV, and this assumption is compatible with the maxim of quality – the speaker's evidence might well come from other people's descriptions of Parker's behavior after he watches TV. (In fact, it is possible to imagine this kind of scenario for (640), where someone could have observed Parker's face while writing, and drawn this conclusion; in such a scenario we would get an ignorance reading.)

The explanation for the single-occasion puzzle here is identical to the explanation of the parallel puzzle in free relatives. The free relative complementizer imposes a (post-update) constraint that the alternative set it introduces is not singleton.[87] If the tense, aspect, and

[87] As a matter of fact, this constraint cannot be general to all free relatives, as it isn't shared by plain FRs:

(i) What Arlo is cooking has a lot of garlic in it.

One way of explaining this is that following Gawron 2001, there is a significant syntactic difference between the two constructions. There are a number of tests that point in this direction (see appendix 2-A). What I will assume, in lieu of further exploration, is that plain FRs should receive Caponigro's 2003 semantic analysis, where there are never any alternatives introduced or collected, and that "-ever" FRs receive the analysis I have suggested here. These differences could easily be lexically tied to a difference in complementizers. We will probably need different

quantificational structure of the sentence containing the free relative mean that there is only one occasion that we can be talking about, the non-singleton constraint would force us to consider other alternatives to what happened or will happen on that occasion. That is, the speaker's epistemic background must include different possibilities for what happens on the same occasion. Consequently, this will force a reading where they do not know the referent of the free relative. Such a reading will not be cancelable (e.g. by Dayal's "namely" test), except by denying the assumption that there is a single occasion in the first place. For instance:

(642) Whatever Arlo is cooking has a lot of garlic in it. (Dayal 1997)

(643) # Whatever Arlo is cooking, namely ratatouille, has a lot of garlic in it.

In the first example, the use of present progressive "is cooking" fixes the alternatives inside the free relative to be locked to some present cooking event that is taking place now. Because of the non-singleton constraint, there must be at least two alternatives, and they must alternative possibilities for what this event could involve. The wideness presupposition results in anything that the speaker takes to be even remotely possible forming a part of this alternative structure. The non-singleton constraint prevents certainty, and the wideness constraint leads to as much uncertainty as is possible. Consequently the sentence conveys speaker ignorance. The "namely" test works here primarily because it runs up against the non-singleton constraint (cf. Dayal 1997 variation presupposition).

This concludes what I will say about free relatives. It is clear that there is much more to be done; what I have tried to show here is that my analysis of "-ever" can be applied in this domain.

4.5 Conclusions on "-ever"

In the first part of this chapter I have given an account of the meaning of "-ever" that cuts across questions, unconditionals, and (to some extent) free relatives. The idea is that "-ever" contributes a presupposition that the domain of discourse (which I take to be the context set) is wide, relative to the alternatives that "-ever" interacts with. This forces discourse participants to consider ways of making the context set precise that contain very unlikely possibilities, and correspondingly the alternatives involved in the denotation of a clause involving "-ever" will include the most unlikely possibilities.

One key example around which the analysis turns is the reality show example in (606). This example illustrates the ignorance effect, as well as the fact that it is not the domain of individuals under consideration that is at issue in the meaning of "-ever" questions. That is, we see an ignorance effect despite a fixed extensional domain. Because the analysis I have developed forces discourse participants to attend to worlds with very unlikely ways of resolving the question of who is sent off, it predicts that this example will be felicitous and have the right meaning.

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complementizers in any case to derive the fact that plain free relatives use a much smaller set of interrogative pronouns that "-ever" free relatives.

The analysis has a variety of consequences for the meanings of constructions involving "-ever". In non-episodic contexts, "-ever" interacts with the meanings of interrogative clauses to lead to an ignorance effect. In other contexts it leads to a quantificational effect, where the alternatives quantified over are as wide a set as possible.

This analysis completes the analysis of the semantics of unconditionals developed in chapter 3, and it allows us to explain the full range of constituent unconditional examples.

4.6 Licensing (un)conditionals

The remainder of this chapter sets out to deal with a group of closely related problems centered around the conditional-like adjuncts that the dissertation focuses on; "if"-conditionals and unconditionals. The main question is what constrains the distribution of different types of conditionals, and what leads to certain kinds of clauses being suited to conditional meanings.

The basic sets of facts that need an explanation are given in (644) and (645).

(644) a. If Alfonso comes to the party, it will be fun.
b. Whether Alfonso comes to the party or not, it will be fun.
c. * Whether Alfonso comes to the party, it will be fun.

(645) a. Whoever comes to the party, it will be fun.
b. * Who comes to the party, it will be fun.

That is, while we can adjoin "if"-clauses, alternative interrogative clauses, and constituent interrogative clauses with "-ever", we cannot adjoin polar interrogative clauses with "whether" or plain constituent interrogatives. The primary focus of this part of the chapter is on the polar/alternative system, though later in the chapter I do discuss constituent interrogatives.

There are two independent reasons to be surprised at (644c). The first is that, in many contexts, polar "whether" and alternative "whether...or not" clauses are apparently synonymous:

(646) Alfonso might know whether Joanna is here today.

(647) Alfonso might know whether Joanna is here today or not.

This has led to many analyses of questions which take the two to be the same at some level of the grammar (see e.g. Karttunen 1977a; Groenendijk and Stokhof 1984; Larson 1985, as well as Bolinger 1978 for some earlier history of this position) The first surprise is that polar interrogatives can't be adjoined with the same meaning as alternative interrogatives with "or not".

The second reason is that in many contexts, polar "if" and "whether" clauses are also apparently synonymous:

(648) Alfonso might know if Joanna is here today.

(649) Alfonso might know whether Joanna is here today.

It is common to take the denotation of a complement-position "if"-clause to be the same as that of a complement-position "whether"-clause (see e.g. Baker 1968, 1970, and more recently Adger and Quer 2001; Eckardt 2006). The second surprise is that polar "whether"-clauses can't be adjoined with the meaning of an adjoined "if"-clause.

By transitivity, we come to a third surprise – why do adjoined "if"-clauses and "whether...or not" clauses mean different things?

These puzzles are instantiations of two very general questions about the systems of clausal adjuncts found in natural languages.

The clausal adjunct licensing problem We often find clause types being used in both the complement systems and adjunct systems. This is especially true for conditionals, but happens with other sorts of clauses as well. This fact leads to a very general question: what governs the relationship between complement and adjunct position clauses? Linguistic theory has focused on clauses in complement position, and at this point in time I think we have a very good understanding of what licenses them – selection by a head. But what licenses adjunct position clauses? They certainly aren't all licensed, as the above data demonstrates; I discuss some more types of clauses that are and aren't licensed below.

The solution to this problem that I argue for is semantic. In general, I argue that the distribution of clausal adjuncts is governed by their semantic type, which determines where in a syntactic structure they can compose without type mismatch (Ernst 2002). I argue against accounts where the distribution is goverened purely by formal features (following Cinque 1999) or by construction types (Gawron 2001).

The distribution of semantic function The second puzzle is closely related to the clausal adjunct licensing problem. I have suggested in previous chapters that one needs some marking of "semantic function" to account for the class of conditional-like adjuncts that all serve a similar function (domain restriction). But if we have such a notion, we must have some notion of how it is distributed and what kinds of elements it can appear on.

I propose here that the semantic function of conditionalization, and the operator that converts certain clausal adjuncts into a type appropriate to adjunct position, are one and the same. In fact, this is already implicit in the analysis developed in chapter 3, but here I make it explicit.

With respect to the particular distribution of this operator in the English (un)conditional system, I suggest that the relevant factor is the bias of the different types of interrogative clauses. English has maximized question bias in the case of "if"-conditionals, and minimized it, in the case of unconditionals. I also suggest that bias determines which type of conditional an interrogative clause is suited to be; polar questions, which always have positive bias, are only suited to have a meaning like that of an "if"-conditional. This proposal is a highly preliminary one.

In the next section I go into the problem of licensing clausal adjuncts in somewhat more detail.

4.6.1 The clausal adjunct licensing problem

In this section I expand on the problem of licensing clausal adjuncts, and set the problem in context. The main contrasts to explain are given in (650) and (651):

(650) a. Whether or not Alfonso comes to the party, it will be fun.
b. * Whether Alfonso comes to the party, it will be fun.

(651) a. Whoever comes to the party, it will be fun.
b. * Who comes to the party, it will be fun.

While alternative interrogative clauses make good unconditional adjuncts, polar interrogatives do not. This fact seems to be quite general across languages; the survey of Haspelmath and König 1998 reveals no language that allows a polar interrogative clause to be used as an unconditional. There are also many languages that do not use an interrogative structure at all; the common denominator seems to be the presence of disjunction of some kind. Below I have given a representative set of examples from H&K's survey.

(652) Euria ari ba-du nahiz eguzkia atera-tzen ba-da irten-go gara
rain ASP COND-has or sun shine-HAB COND-is go.out-FUT we:are
'Whether it rains or the sun shines, we will go outside.'
(Basque; conditional-based structure with disjunction)

(653) Ob ich gewinne oder verliere, Badminton macht mir Spass
Whether I win or lose Badminton makes me fun
'Whether I win or lose, Badminton is fun.'
(German; interrogative-based structure with disjunction)

(654) Sata-koon tai paista-koon, lähde-mme ulos
rain-IMP or shine-IMP go-1PL out
'Whether it rains or the sun shines, we'll go out.'
(Finnish; imperative mood[88] with disjunction)

Similarly, while a "wh-ever" clause is allowed as an adjunct, a plain "wh"-clause is not. This is particularly puzzling given the overwhelming evidence that "wh-ever" adjuncts are interrogative clauses (cf. chapter 2). "Wh-ever" questions are certainly not the unmarked case of questioning. Again, some languages in Haspelmath and König's 1998 survey do not use interrogative clauses for their version of constituent unconditionals; the common denominator here is that an interrogative pronoun is used, and if possible, a marked form.[89] I give some representative examples, though because there are more types of constituent unconditionals

[88] This patterns with the group of languages that use some kind of subjunctive-type marking.

[89] Unlike the generalization about disjunction which, as far as I know, is absolute, there are exceptions to the generalization about interrogative pronouns. One of the unconditional constructions in Irish is the only clear-cut counterexample presented by Haspelmath and König. There are also various kinds of degree or amount unconditionals, which may actually be correlative constructions, that do not use an interrogative pronoun.

than alternative unconditionals, I do not cover H&K's classification with the examples here. For the case of on object marking an interrogative (or potentially relative) pronoun, I give German, which is relatively like English, but a whole host of particles can mark the pronoun in different languages (H&K give examples of pronoun-marking particles that normally mean "want", "also", "that", "if", "only", "yet", and temporal "then"). In addition, some languages have a marking particle that appears before the pronoun. A few reduplicate the pronoun.

(655) Minne (tahansa) hän mene-e-kin, mies ei koskaan tule jättämään häntä
where (want) she go-3SG-also man not never will leave her
'Wherever she goes, he will never leave her'
(Finnish; interrogative pronoun plus focus marker "kin" on verb)

(656) Was immer du uns kochst, ich freue mich auf das Essen mit dir
what ever you us cook I rejoice self on the meal with you
'Whatever you are cooking for us, I am looking forward to the meal with you.'
(German; interrogative pronoun with "-ever"-like marker following)

(657) Gde by ja ni byla, vezde menja vstrecali druzeljubno.
where SUBJ I not be everywhere me met friendly
'Wherever I was, everywhere people met me in a friendly way.'
(Russian; interrogative pronoun plus negation on verb, subjunctive)

The predominant case is that it is the interrogative or relative pronoun that is morphologically marked, but this is not the only route. In all cases, the clause is morphologically marked in some way, in addition to being adjoined.

As I suggested in the introduction, this problem is quite general. Some complement-position clauses can be used as adjuncts, and some cannot. The question is what principles govern this. We arrive at the general problem of licensing clausal adjuncts via X-bar theory. Just as with other kinds of adjuncts, traditional X-bar theory tends to over-generate for clausal adjuncts. Here are two predictions made by X-bar theory and its descendants:

(658) **The clausal adjunct prediction, pt. 1**
The class of CPs allowed in adjunct position in a language will tend to be much larger than the class of CPs allowed in complement position.

(659) **The clausal adjunct prediction, pt. 2**
Every kind of CP that can appear in complement position will be able to appear as an adjunct.

Together the prediction is that the set of complement position CPs will be a subset of the adjunct position CPs. The reasoning behind both parts is the same: argument-position CPs are selected, and adjunct-position phrases are not. However, only part 1 of the prediction is met. We do find a much larger class of CPs in adjunct position, but only some complement position CPs appear in adjunct position.[90] The distinction in English between polar and

[90] Part 1 seems to be very generally true, in languages that have the ingredients.

alternative interrogative clauses epitomizes the kind of distinction found more generally in the CP system. In general, we find gaps.

First, a few more argument-position CPs that can appear as adjuncts:[91]

(660) a. For Alfonso to talk to Joanna, he must have been really desperate.
b. Henry asked for Alfonso to talk to Joanna.

(661) a. To get to Harlem, you have to take the A-train. (*Anankastic* adjunct)
b. Henry wanted to get to Harlem.

We have already seen two gaps. There are several more kinds of argument-position CPs that, while not strictly speaking adjunct gaps, have a very limited distribution as adjuncts. These are "that"-clauses, and finite clauses without an overt complementizer.

(662) a. That his son would not have to join the army, he joined himself. (Bresnan 1972 ex. 84)
b. You touch that cookie, you're grounded.

(663) Compare:
a. So that his son would not have to join the army, he joined himself.
b. (You) touch that cookie and you're grounded.

The distribution of "that"-clauses seems to be limited to examples involving a modal in the adjunct. Such examples tend to feel archaic. The example above with a past tense "did" instead of the modal sounds odd, but the corresponding "so that" clause is fine.

(664) ?? That his son did not have to join the army, he joined himself.

(665) So that his son did not have to join the army, he joined himself.

The bare finite adjuncts seem to necessarily involve a second person subject in the adjunct. They are very closely related to paratactic conditionals as in (663b) above; such structures either involve a declarative sentence with a second person subject, or an imperative sentence. Even for the declarative sentence, such examples may involve the first conjunct being treated as a command, not an assertion. We can see that the kind of example above in (662b) is *not* a paratactic structure by examining data such as (666) below, where the finite clause is right-adjoined. This order (consequent, antecedent) is not possible in a paratactic structure, but is possible in all clausal adjunct structures (information structure permitting).

(666) You're gonna kill yourself, you keep driving like that. (Haiman 1986 ex. 17a)

(667) (You) keep driving like that and you're gonna kill yourself.

[91] See von Fintel and Iatridou 2005; Huitink 2005; Nissenbaum 2005; von Stechow et al. 2005 for more on the "anankastic" adjuncts, including the non-finite variety. It is not clear yet from the existing literature what a unified analysis of argument/adjunct position non-finite clauses would look like, and I will not add anything to that issue here.

(668) # You're gonna kill yourself and (you) keep driving like that.

Both of these kinds of data illustrate further that we must allow for gaps in the clausal adjunct paradigm, and have some mechanism in the grammar for conditioning such gaps.

Pullum and Rawlins 2007 hint that certain aspects of the unconditional system of English might be derivable from general constraints on exhaustiveness. That is, adjuncts are ruled out if they violate exhaustiveness presuppositions. However, this is clearly not generalizable beyond unconditionals; "if"-conditionals and other types of clausal adjuncts do not involve any constraint of this type. Further, exhaustivity effects are not sufficient conditions for being adjoinable either. For instance, we want to allow for the possibility of languages to not have interrogative unconditional adjuncts at all, even if such clauses might in principle make good unconditional adjuncts. We also want to explain the fact that polar interrogative clauses and plain constituent interrogative clauses have denotations that are just as exhaustive as the interrogative clauses we do find in unconditional structures.

In conclusion, the use of argument-position clauses in adjunct position is quite common in English. However, it must be constrained in some way, and it seems that it is subject to a certain amount of arbitrariness. We must resolve the tension between the need to capture the amount of arbitrariness that is possible, and the possibility that some of the patterns we see can be derived from more general principles.

The chart in Table 11 gives an overview of the English CP system, showing which adjuncts appear where. The problematic cases, where there is no or limited argument to adjunct transfer, are in gray.

Kind of clause (+finite)	*after* CP	*although* CP	*as if* CP	*because* CP	*before* CP	*even though* CP	*if* CP	*in case* CP	*lest* CP	*no matter* CP	*now that* CP	*provided* CP	*since* CP	*so* CP	*so that* CP	*that* CP	*though* CP	*unless* CP	*until* CP	*when* CP	*whereas* CP	*whether* CP (polar)	*whether* CP (alternative)	*while* CP	∅ CP (with *wh*-int)	∅ CP (with *wh-ever*-int)	∅ CP (with finite declarative)
Adjunct?	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	(+)	+	+	+	+	+	-	+	+	-	+	(+)
Argument?	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	-	+	+	+

Kind of clause (-fin)	*despite* gerund	*for* CP	*in order* CP	*with* gerund	bare non-finite (*to*)	bare non-finite (*-ing*)
Adjunct?	+	+	+	+	+	+
Argument?	-	+	-	-	+	+

Table 11: Kinds of clauses, and their argument/adjunct availability

4.6.2 The cross-linguistic picture of (un)conditionals

Because of the apparent meaning similarities, we are faced with the possibility that some of what we see in the English clausal adjunct system is an arbitrary property of English. The question of what should be derived and what should be arbitrary is not easy to resolve without looking beyond English. We need some way of determining how deep and universal the facts of English are.

Fortunately, the survey of Haspelmath and König 1998 is extremely useful with respect to unconditional systems, at least in European languages. I have already noted one of the main results following from that work – alternative unconditionals seem never to involve polar interrogative clauses, and the common denominator is disjunction. (Note that sometimes, the disjunction is specific to the unconditional construction, but it is always plausible to call it disjunction.) The unacceptability of English polar interrogative clauses as alternative unconditional adjuncts is, therefore, a "deep" fact.

However, it is relatively common for markers of embedded polar interrogative clauses to be used as markers of conditional adjuncts (Jespersen 1909–1949 vol.5, Haiman 1978 §1.3, Traugott 1983). For example, in most modern Romance languages we find derivatives of Latin "si" marking both embedded polar interrogatives and conditional adjuncts (Harris 1986). In Romanian we find a different (non-Romance) marker of both, "dacă" (Donka Farkas, p.c.). These cases are particularly interesting, as in Latin, "si" marked only conditional adjuncts, and the language used different markers for embedded interrogatives ("num" etc.; see Harris 1986 for discussion). What this means is that in the development of Romance we have widespread generalization of conditional markers to mark embedded polar interrogatives as well. English also instantiates the interrogative pattern, though it is not usually thought of this way (perhaps because of the use of both "if" and "whether"), with "if"-clauses as both interrogative and conditional clauses. The two categories are clearly related quite closely, and therefore it is not obvious that it is a deep fact that an adjoined "whether"-clause cannot have a conditional meaning in English.

The use of "wh-ever" pronouns instead of plain "wh" pronouns in unconditionals strongly matches the typological pattern. That is, if it is possible, a language will not allow the unmarked form of an interrogative pronoun in an unconditional construction (see data to this effect earlier). Here again we must allow for non-interrogative structures as constituent unconditionals. In some languages we find relative structures[92], and in Irish, we find a structure that does not involve any interrogative pronoun: (H&K ex. 95)

(669) Téadh sí ina rogha áit, ní fhágfaidh sé go deo í.
go.IMPV she in:her choice place, not leav:FUT:3Sg he ever her.

[92] There is some question as to whether any or all of the relative-clause unconditional languages actually use a correlative construction for the data Haspelmath and König investigate; H&K do not address this issue. Correlative structures have a fundamentally different semantics from unconditionals (Dayal 1996), and probably a fundamentally different structure as well; see chapter 2 for detailed discussion. However, it may be that they still fall under the domain of the mechanism for licensing clausal adjuncts. Even for Bhatt 2003, where single-head correlatives are merged adjoined to DP, multiple-head correlatives are merged adjoined to IP.

'Wherever she goes, he will never leave her.'

Irish also has a more standard constituent unconditional construction that appears to use marked forms of the interrogative pronouns (Jim McCloskey, p.c.). Many languages do use unmarked interrogative pronouns, but the clause is always marked in some idiosyncratic way, e.g. by subjunctive mood, or negation on the verb (or both of these, as in the Russian example given earlier).

The list in (670) gives on overview of the points that I will take away from this discussion. These points give us a rough guide to what facts are deep, and what facts are peculiarities of English. For instance, the fact that polar "whether"-clauses cannot be adjoined with an "if"-clause meaning is a fact about English, but the fact that they cannot be adjoined with an unconditional meaning is a deep fact. There is of course still a significant amount of cross-linguistic work to do on this class of adjuncts; H&K's survey raises as many questions as it answers about the semantics of unconditionals in the languages it discusses.

(670) **Summary of empirical generalizations**

a. A language may disallow adjunction of an interrogative structure.
b. If a language allows an alternative interrogative clause to adjoin, it will have an alternative unconditional meaning.
c. If a language allows a polar interrogative clause to adjoin, it will have an "if"-conditional meaning.
d. If a language allows some kind of constituent interrogative clause to adjoin, it will require the structure to be marked in some (language-specific) way.

4.6.3 A semantic analysis of adjunct licensing

As a starting point, I will give an analysis that captures the facts, as well as the prediction about clausal adjuncts in (658) (that there will be a limited class of complement-position clauses, and a larger class of adjunct-position clauses). Ernst 2002 provides an account of adverb distribution where adjunction is constrained by semantic composition (as well as several other factors that will not be relevant here). I will develop this initial analysis in this kind of framework. In the next several sections I will compare this analysis to the solution to unconditional licensing developed in Gawron 2001, as well as a hypothetical version of the analysis in the framework of Cinque 1999.

First, some preliminaries. In this section I will assume that modifiers uniformly have types like ⟨XX⟩, i.e. they map something of type *X* to a new object of the same type. This assumption is an old idea from combinatory categorial grammar (see e.g. Dowty 2003 for discussion of the syntactic correspondents of such types). It is by no means the only way of assigning a type to a modifier (see e.g. Kratzer 1996), and it is certainly not the only or standard kind of type assumed for conditional adjuncts (see e.g. Heim 1982; von Fintel 1994; Schlenker 2004; Bhatt and Pancheva 2006, and the discussion in chapter 2). However, it is a useful assumption for

the present discussion, in that it allows us to look at restrictions on the licensing of clausal adjuncts in a uniform way.

This assumption already constrains the distribution of adjuncts of all kinds. An adjunct of type ⟨XX⟩ will only be able to combine with a constituent whose denotation is type X.

Alternative approaches to the interpretation of "if"-clauses typically assume a relatively simple semantic type (e.g. they treat the "if"-clause as a proposition) in combination with some syntax/semantics interface assumptions, e.g. that the clause obligatorily binds a covert world/situation variable in its scope. I criticized such approaches in chapter 2, and one of the reasons was that they make conditional adjuncts less similar to clausal adjuncts in general. The alternative assumptions can be used to define the licensing conditions for conditional adjuncts as well, but they will not generalize. Therefore I stick to the purely semantic notion.

Given this assumption, it is easy to see how clauses that act purely as sentence modifiers will work. A "because"-clause, for instance, will have type ⟨⟨st⟩⟨st⟩⟩, and it will have this type because of the lexical meaning of "because". "Because" has what might be called a *modifier-generating* type such as ⟨⟨st⟩⟨⟨st⟩⟨st⟩⟩⟩. We further predict that this class of clauses will never appear as arguments. Even a clause-embedding verb that is completely unselective with respect to the syntax of its complement will never be able to compose with a clause that can only have a modifier type. To the extent that complementizers can lexically have only modifier-generating types, we predict a large class of clausal adjuncts that will never appear in complement position.

The ability to appear in both complement and adjunct position therefore relies on a clause being able to have both a modifier type and a complement type of some kind. Example complement types might include ⟨st⟩ for propositions, and ⟨s⟨st⟩⟩ for questions, following Groenendijk and Stokhof 1984. In the Hamblin framework I use in this dissertation, in fact these would both have a propositional type ⟨st⟩; the difference is captured in the size of the alternative set. Previously in this chapter I have argued that there must be some arbitrariness in argument-adjunct transfer; we cannot freely shift any argument clause type into an adjunct type. Therefore, the grammar must provide some mechanism for doing this shift, and the application of this mechanism must be constrained to certain clause types.

In this dissertation I focus only on "if"-clauses and unconditional clauses, as well as the gaps in this system. I will not deal with argument-adjunct transfer found with non-finite clauses (which seems quite free, and potentially conditional-like), or with "that" clauses and un-headed declarative clauses. There is much work to be done here, but I leave dealing with the adjunct/argument nature of these clauses for the future. Therefore, the goal is to develop a suitably constrained mechanism that can transform "if"-clauses, alternative interrogative clauses, and constituent interrogative clauses into modifier types.

I assume familiarity with the unified semantics for "if"-conditionals and unconditionals in chapter 3. The idea there is that both kinds of adjuncts serve the same function – to restrict the domains of operators in their scope. I accomplished this by taking them both to introduce premises/background assumptions into the discourse context. In that chapter I signified that both kinds of adjuncts have this function with the operator Cond.

(671) $[\![\textsc{Cond}]\!]^{g,c} = \{\lambda p_{\langle st\rangle} . \lambda p'_{\langle c\langle st\rangle\rangle} . \lambda w_s . p'(c + (f_c \sqcap p))(w)\}$

Note that with one embellishment this modifier is effectively of a modifier-generating type. The embellishment is that it abstracts over the context of the sister of the conditional adjunct; this is triggered by the higher type for this argument position. To make it a more "pure" modifier-generator, we could easily have it result in a denotation for the sentence of type $\langle\langle c\langle st\rangle\langle c\langle st\rangle\rangle\rangle\rangle$ instead of $\langle\langle c\langle st\rangle\rangle\langle st\rangle\rangle$. The content of the operator is to place the restriction, represented by the argument p, into the context used to interpret the modified clause.

I will make one small change in the view of the conditional operator here. I will treat it as a feature, that does or does not appear on certain lexical items. We need to make some assumption because if this is the case, it will appear in the same bundle with e.g. the iQ feature (for unconditionals). Since that feature also has a meaning, we need some theory of how the two interact compositionally. It does not matter much for me what that theory is, and I will assume that in LFs, this feature is interpreted as taking scope over a constituent where it appears on a head, while the iQ feature stays behind. One way of spelling this out concretely would be simply to say that it is specified in its lexical entry that the feature must move to adjoin at LF. We already might need similar rules for e.g. modal operators, and negation (on some accounts).[93] What is crucial for present purposes is that it is licensed or not by certain complementizers.

In the system I have developed, this feature can be placed without complication on top of an alternative interrogative clause, or a constituent interrogative clause, leading to an unconditional interpretation. To place it on an "if"-clause, we do have to make one complicating assumption: that "if" in such cases makes no contribution to the semantics of the clause. That is, we have to assume that an adjoined "if"-clause does not have the interrogative semantics it does in complement position. This is an *extremely* common and typically unquestioned assumption, but it is a complication nonetheless. Why would this be so for the complementizer of "if"-conditionals but not unconditionals?

One way of dealing with this might be to assume that "if"-clauses in complement position are also not properly questions, and that there is some kind of type-shift. For instance, we might assume that (following Schlenker 2004) "if"-clauses denote a definite description over possible worlds, and further assume that it acts as a concealed question in this particular syntactic context. One reason to think that this isn't so is that this approach suggests that "whether"-clauses will be the canonical kind of polar interrogative. But corpus evidence suggest that this is not so. It can be seen from corpora that "if"-clauses are far more common than polar "whether" clauses. In the BNC there are about twice as many "if"-clauses immediately following a verb as "whether" clauses, and this doesn't even exclude alternative interrogative clauses headed by "whether". That is, a search for "[v??] whether" turns up 10777 hits in the BYU edition of the BNC (Davies 2004-), and a search for "[v??] if" turns up 19784. This does not seem to be a fact just about that corpus. In the BYU Corpus of American English (Davies 2008-), "[v??] whether" turns up 31987 hits, and "[v??] if" turns up 74961. This is a rough ap-

[93] Alternatively, we could view the feature bundle as having an articulated structure that could internally undergo compositional operators, with the COND and the Q feature joining in the appropriate way to make a complex composite operator.

proximation, since this doesn't exclude such clauses as the complement of the copula, or such clauses right-adjoined following an intransitive verb, but an examination of the environments suggest that neither factor is significant to the total counts.[94]

For the moment, however, let us assume that "if"-clauses are simply ambiguous, despite these objections. I will refine this idea shortly.

In this system, the distribution of the COND feature constrains the distribution of the clauses that it appears on. Without such an operator, none of the unconditional or "if"-conditional clauses will be suitable adjuncts, as none of them will have a modifier type. With it, any of them will have a modifier type. Therefore, if we can constrain the distribution of the operator itself, we can derive the distribution of clausal adjuncts, or at least those that take on a conditional function. Another way of thinking about this is that if we can explain why certain adjuncts do or do not take on a conditional function in various ways, we can explain their distribution in terms of function. (Where, of course, function is represented by the COND feature.)

Before attempting to give explanations for the distribution of this feature/function, I will give a statement of how the distribution of adjuncts that I am considering here can be captured in the grammar. The brunt of the work is placed in statements of whether certain items are lexically compatible with the COND feature. The system is presented in Table 12.

complementizer	basic feature makeup	status of conditional feature
no matter, *regardless*, *unless*	varies	lexically a modifier-generator type
if	[]	COND required
if	[iQ,POL]	COND prohibited
whether	[iQ,ALT]	COND optional
whether	[iQ,POL]	COND prohibited
∅	[iQ,uWH,EVER]	COND optional
∅	[iQ,uWH]	COND prohibited

Table 12: Feature system for a semantic account (first pass)

So, for example, the alternative form of "whether" can optionally carry a COND feature, but the polar form is not compatible with COND. "If" is ambiguous as to whether it carries the iQ feature, but when it doesn't, it must have the COND feature, and when it does, it can't.

This is not a very explanatory analysis. To an extent it amounts to a description of the facts of English. It is a stipulation that the polar interrogative complementizer is not compatible with the COND feature, and that the alternative interrogative complementizer is. A similar stipulation is made for constituent unconditionals. As mentioned above, we also stipulate that when "if" gets the COND feature, it loses its question feature. We should want to do better, and shortly I will suggest several improvements. First, though, I will say what this analysis does get

[94]There are of course differences in verb preferences. The top 3 verbs taking "if"-clauses in the CAE are "see", "know", and "wonder", whereas the top 3 for "whether" clauses are "determine", "know", and "decide".

right. (I return to this issue following the presentation of the two alternative analyses; even this version is superior to those.)

It is not all stipulation. The COND feature or something very much like it, I have argued, is independently necessary. This is because there are a range of conditional constructions that do not involve "if", or any shared marking, but do seem to share the semantics of operator domain restriction (cf. chapter 2). What I have shown in this section is that, on a semantic theory of adjunct licensing (where the type system acts as a filter on free adjunction), this same feature can also govern the distribution of adjuncts that can carry it. That is, because of the use of semantics to constrain distribution, the analysis predicts both distribution as an adjunct and conditional function at the same time. It also consequently predicts a free distribution of conditional adjuncts, exactly what we want. The distribution of pure adjuncts (i.e. clauses that can appear only in adjunct position) is a matter of lexical semantics, and this is also desirable.

Where the arbitrariness or stipulation appears is in the lexical statements of what complementizers and other features are compatible with COND. In general, the fact that this analysis encodes a certain amount of arbitrariness is not necessarily bad, provided that we can show that the facts *are* arbitrary. It is certainly arbitrary whether a language uses e.g. an alternative interrogative clause vs. a disjunctive clause marked with subjunctive as its unconditional adjunct. In such languages, we will need to encode the fact that alternative interrogative clauses can't be adjoined with a conditional meaning. But within the field of interrogative clauses (and perhaps within the field of subjunctive clauses, though this remains to be investigated; see Izvorski 2000b for discussion), the choice of adjunct does not appear to be arbitrary, and it is here that the analysis I have sketched above is not explanatory. I turn to this in the last parts of this chapter. Before doing so, I will consider several alternative methods of licensing clausal adjuncts.

4.6.4 A construction-based analysis of adjunct licensing

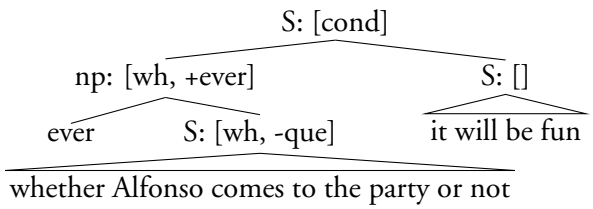
Gawron 2001 provides the only analysis of the unconditional licensing facts that I know of in the literature. Since Gawron's discussion of unconditionals is fairly comprehensive, and I discuss the semantics in much more detail in both chapter 1 and chapter 3, here I will focus on the parts of the analysis which determine the distribution of unconditional adjuncts.

The starting point, for present purposes, of the analysis, is that there is an unconditional construction. Gawron implements this by means of feature driven syntactic constraints. In particular, an S node with the feature [cond] has two children: an NP adjunct that has the features [wh, +ever], and a regular S. (As a side note, the name of the feature [cond] is misleading, because it is quite specific to the unconditional construction. Nevertheless, I will continue to use Gawron's terminology throughout this section.) An NP node with the features [wh, +ever] has two children: "ever", and an S: [wh, -que]. There are two immediate questions that arise: what about alternative unconditionals that don't seem to involve "ever", and what does it mean for a clause to have the features [wh, -que]. The answer to the first question, on this analysis, is that "whether" + "ever" = "whether". This is straightforward to implement in most morphological frameworks, but it is unclear how justified an assumption it is. We also must

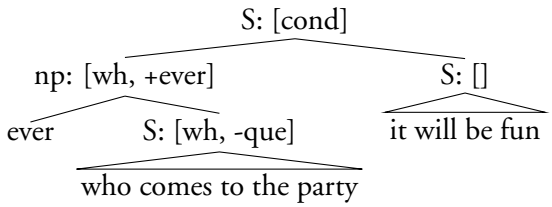
assume that some morphological operation such as Distributed Morphology's local dislocation operation (Embick and Noyer 2001) attaches "ever" to a nearby "wh"-item. The answer to the second question is more involved; a clause with the features [wh, -que] is what Gawron terms a "pre-question". This is the syntactic and semantic unit used to build questions, unconditionals, and "wh-ever" free relatives.

The structures involved are shown in (672) and (673).

(672)



(673)



To understand how the kinds of structures involved are constrained, we must understand how pre-questions work. Pre-questions for different types of questions have different types. A polar pre-question is type ⟨st⟩, and a constituent pre-question is type ⟨s⟨et⟩⟩. Alternative pre-questions are the interesting case, and Gawron breaks from Groenendijk and Stokhof 1984 in proposing that they work more like constituent pre-questions than polar pre-questions. Where constituent pre-questions are predicates of individuals, alternative pre-questions are predicates of propositions, type ⟨s⟨⟨st⟩t⟩⟩. (See chapters 1 and 3 for more detail on the semantics that goes with these types.)

A question is not picky about what kind of pre-question it takes.

(674) **Gawron-style question construction**
Where α is an S: [wh, -que]:
$[\![\textbf{S: [wh, +que]}\ \alpha]\!] = \lambda i \lambda j ([\![\alpha]\!](i) = [\![\alpha]\!](j))$

This gives a standard Groenendijk and Stokhof 1984 denotation for a question, and in fact Gawron's non-standard treatment of alternative questions reduces to the standard case for purposes of this definition. Another way of thinking about this construction is that the feature [+que] simply requires a sister of type ⟨sX⟩ for any X. All of the pre-question types fulfill this.

Unconditionals are more picky about what type they take – they require a predicate of some kind.[95] It is really the semantics of "ever" that imposes this requirement, since it acts like a determiner semantically. The alternative and constituent pre-question types satisfy this,

[95] Caveat: I am doing a certain amount of reading into Gawron's account of alternative unconditionals, since this part is never made explicit. Therefore, errors are mine.

but the polar pre-question type does not. Therefore, a polar pre-question is syntactically fine (it has the right feature structure), but incurs an unresolvable type mismatch. "Ever" requires something of type ⟨s⟨⟨st⟩t⟩⟩ or ⟨s⟨et⟩⟩, but gets something of type ⟨st⟩.

Constituent unconditionals without "-ever" are unacceptable for a different reason. They are not a valid instantiation of this construction, since they won't have the [+ever] feature; unlike "whether" clauses, there is no morphological rule to obscure the appearance of this feature on the surface. Though Gawron does not note this, it is important to point out that just positing the existence of an unconditional construction that requires "ever" is not enough to rule out plain "wh" interrogative clauses in adjunct position. We must also assume that no other adjunct construction licenses such adjuncts. Similarly, in this kind of system, we must assume that no other adjunct construction licenses polar interrogative adjuncts. Perhaps surprisingly, trying to work out the licensing conditions by assuming an unconditional construction ends up committing us to an entire theory of clausal adjunct constructions built upon the same lines. A constructional feature gives us the means to do some kind of semantic or syntactic selection, and license only certain kinds of adjuncts, but at the same time it punts the licensing question up a level – it does not answer the question of what is selecting the feature.

Evaluation This account covers the facts of English, and it also has the capability to make at least one of the desirable typological predictions. It is quite reasonable to assume that the types for pre-questions should be universal. We can also assume that something like the [cond] feature, and correspondingly, something like the [+ever] feature, appear in every unconditional construction in any language. Of course, the morphological instantiation of the marking varies across languages. From these two assumptions it follows that we would never expect to find polar interrogatives in an unconditional construction. From this second assumption it also follows that we will find marked clause structures in constituent unconditionals.

This first assumption closely matches the analysis that I have adopted here. I have assumed that clauses are lexically specified for whether they can take a feature COND. It is the licensing of this feature that governs the distribution of clauses that can take it. So in this sense my analysis of the facts is similar to Gawron's. The major difference is that COND is a feature of an adjunct, not a main clause, and the distributional consequences are a byproduct of the semantics of the feature. For Gawron 2001 [cond] is a purely formal feature. Here I have also not followed Gawron's assumption that "-ever" plays a primary (selectional) role in the licensing of unconditionals; the reason is the lack of evidence for the assumption that this morpheme appears covertly with alternative unconditionals.

Aside from empirical motivation, it is not clear what the second assumption (that an analogue of the [+ever] feature appears on any unconditional adjunct) would follow from. This underscores a general fact about the analysis of Gawron 2001, that the reasons for the ungrammaticality of polar interrogatives and plain "wh" interrogatives in adjunct position are entirely different. The analysis here takes the reasoning in each case to be about the licensing of COND.

I think there are a number of further reasons not to adopt this account of unconditional licensing as-is. One major problem is that it is not clear that the internal syntax of the ad-

juncts is motivated. I have shown in chapter 2 that alternative unconditional adjuncts pattern identically with embedded alternative interrogatives – there is simply no question that they involve a different internal syntax. Yet the Gawron 2001 analysis would have us treat them as noun phrases, with a silent attached "-ever". Similarly, there is very strong evidence, discussed in chapter 2, that constituent unconditionals involve the internal syntax of an interrogative clause. They very clearly do not involve a nominal structure. Gawron 2001 gives evidence to show that constituent unconditionals, interrogatives, and "wh-ever" FRs pattern together, but does not discuss the ways in which constituent unconditionals and interrogatives do not pattern with "wh-ever" free relatives; in the face of such data, a unifying account must be abandoned. One further point is that we do not find alternative interrogative clauses in complement position with the distribution of "wh-ever" FRs; Gawron 2001 would predict that we do, as far as I can tell. The conclusion I take away is that this account over-unifies the three constructions.

The analysis relies on there being a sentential construction marked by the [cond] feature, effectively as a first-order object in the grammar. A perhaps surprising consequence is that if we make this assumption, we must make several very general further assumptions. The analysis prevents polar interrogatives from being licensed by the feature [cond]. But in order to prevent polar interrogative clauses from being licensed as adjuncts, we must also assume that there is no other construction that licenses them, and that there is no free adjunction. That is, this simple assumption forces us to assume that the entire clausal adjunct system is governed by similar principles. A consequence of abandoning free adjunction is that we lose part 1 of the clausal adjunct prediction as any kind of direct prediction. Clauses only adjoin to the extent that there are constructions that allow them to.

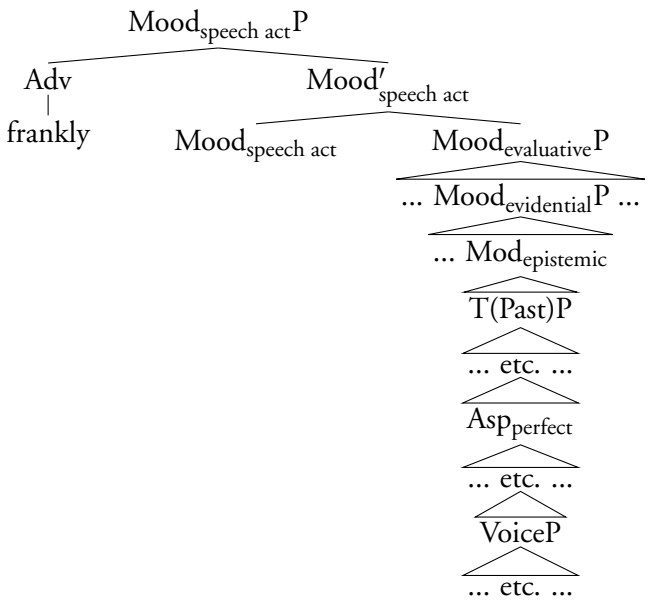
In summary, the most promising idea from Gawron's 2001 account of these facts is the use of selection to rule out polar "whether"-adjuncts. I have adopted this into my analysis in the form of lexical compatibility of a complementizer with the Cond feature.

4.6.5 A functional head analysis of adjunct licensing

Cinque 1999 provides an extensive study of ordering restrictions on adverbs. Since ordering amounts to licensing, Cinque's theory (which I will refer to as the "functional head" theory) is an appropriate theory for tackling the problems here. Cinque does not address clausal adjuncts, but it is easy to see how the functional head theory might.

The starting point of the theory is to abandon the X-bar approach to adverbs altogether. Adverbs are not adjoined, but rather base-generated in specifiers of functional heads. For example, speech act adverbs ("frankly, honestly, simply, seriously, confidentially", etc.; for discussion and references see Cinque 1999 §4.5 and Ernst 2002 §2.4.2) tend to appear to the left of most other classes of adverbs, and so they appear in the specifier of a functional head that is very high in the structure of the clause. In particular, they appear in the specifier of $\text{Mood}_{\text{speech act}}$. The tree in (675) illustrates this, along with some more parts of the functional structure proposed in Cinque 1999.

(675)



To understand how this theory is to be used as a licensing mechanism, we must delve into the technical details. The most complete specification I've seen of the details of the functional head theory, from Cinque 2004, is quoted below (my italics):

> I will continue to assume that *adverbs, when present in the numeration, are merged ("base generated") under a checking relation with the corresponding functional head of the clausal hierarchy*, which I take to be obligatorily part of the numeration (like the prototypical T and C are for Chomsky 1995,240). When no adverb is part of the numeration (hence merged), I take the corresponding functional head to receive the default interpretation (cf. Cinque 1999,section 6.1).

This can be expanded on more still; in what follows I spell out the minimum that is necessary to make the checking relation work that is referred to in the above quote. Let us suppose we are considering a functional head α that licenses some class of adjuncts β. The head α must carry, optionally, some feature that also appears in a prominent position in every member of β. In particular, I will assume that this feature is lexically specified on the head of β. Following more recent minimalist work on agreement, I will assume that the instance of the feature on α is interpretable, and the instance on β is uninterpretable. Further, following Pesetsky and Torrego 2007, I will take each instances to be unvalued when the corresponding item is merged.[96] The interpretative role of the feature on α would be to integrate the meaning of the adverb into composition in the correct way (cf. Rawlins 2008a). The role of the uninterpretable instances

[96]Something like this assumption is necessary; otherwise we will not require a member of β to co-occur with the presence of the licensing feature on α. Alternatively, we could have a symmetric agreement relationship, i.e. involve an interpretable and uninterpretable instance of two features on each item, or we could perhaps arrange for semantic filtering.

of the feature on members of β is to formally mark members of a class of adverbs. In order to make this work, there must be one such feature for each class/functional head.

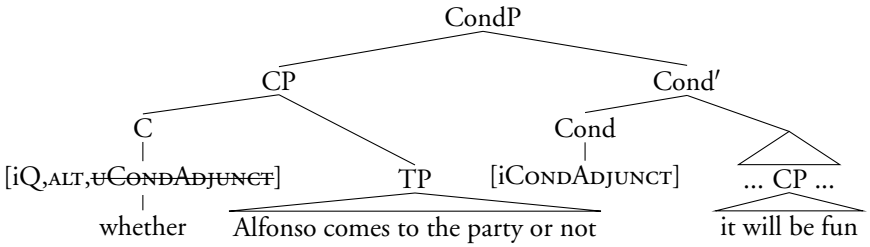
This is the necessary machinery to build an account of unconditional licensing in English. It is not clear what functional projection unconditionals and conditionals appear in, but let us suppose that it is simply called CondP. (I return below to the question of where in the functional hierarchy it is.) We have α, and now we need a feature. Suppose there is a feature iCondAdjunct that can appear on α. Then we can define certain complementizers such as "regardless", "no.matter", and perhaps "unless", as lexically carrying uCondAdjunct.

The complementizer "if" is a little more complicated, as it will only have this feature optionally – when appearing in argument position, it should presumably involve the features of an interrogative clause, [iQ].

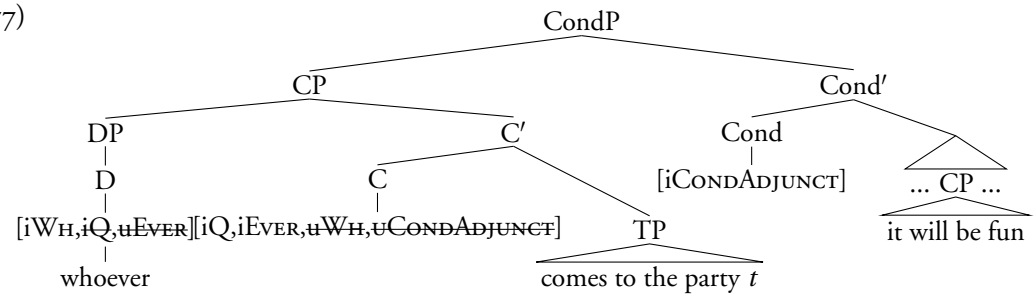
To capture the distinction between polar and interrogative clauses let us assume that there are really two items, "whether" with the features [iQ, Pol] and "whether" with [iQ, Alt]. Lexically it must be specified that only the first one can take uCondAdjunct. We can do something similar with constituent interrogatives, and take "ever" to correspond to a feature Ever on the complementizer (cf. discussion in chapter 2). The complementizer with Ever would be incompatible with uCondAdjunct.

In the following trees, and in Table 13, I summarize the state of affairs.

(676)



(677)



It should be clear that this account, though couched in much more general terms than the constructional account in Gawron 2001, is a step backwards relative to that account. It makes no predictions outside of English, and everything might as well be an accident. While the functional head account gives us the tools to formalize the licensing conditions of unconditional and conditional adjuncts in English it does no more than that. Table 13 is simply a restatement of the facts, and no more. In this sense it is not any different than the Ernst-style analysis in 12.

type of clause	basic feature makeup	status of adjunct feature
no matter, *regardless*, *unless*	varies	uCONDADJUNCT required
if	[]	uCONDADJUNCT required
if	[iQ]	uCONDADJUNCT prohibited
interrogative	[iQ,ALT] and [iQ,uWH,EVER]	uCONDADJUNCT optional
interrogative	[iQ,POL] and [iQ,uWH]	uCONDADJUNCT prohibited

Table 13: Summary of complementizers on a Cinque-style account

There is an additional problem. The functional head analysis tends to predict significant strictness in terms of possible adjunct orderings. However, clausal adjuncts are very relaxed in terms of the positions they can appear in. It is not just that we tend to find sentence-final VP attachment sites; this could be solved by putting the CondP projection in several places in the structure. It is that a huge range of other adverbials, just about everything in the upper part of Cinque's hierarchy, can appear both before and after sentence-initial clausal adjuncts. In the following data, I show the ordering of an "if"-conditional relative to both speech act adverbs and habitual adverbs like "usually". Speech act adverbs appear at the very top of Cinque's functional hierarchy, and habitual adverbs appear quite far down, in the specifier of $\text{Asp}_{\text{habitual}}$. (For unclear reasons, "then" is preferably pre-adverb when the "if"-clause appears to the left.)

(678) a. Frankly, if Alfonso gave Joanna money, he's an idiot.
b. If Alfonso gave Joanna money, (then) frankly, he's an idiot.

(679) a. Usually, if a farmer mistreats a donkey, he's an idiot.
b. If a farmer mistreats a donkey, (then) usually, he's an idiot.

One possible way of resolving this problem is to assume that adverbs can often move out of their base positions. We find the free ordering because they can move either before or after the clausal adjuncts. Cinque 1999 already needs a certain amount of movement, but it remains to be seen how much, and whether the movement necessary to derive the orderings in the examples above can be justified.

Comparing a Cinque-style analysis of clausal adjunct licensing with the constructional analysis in Gawron 2001 leads to a significant conclusion. The functional head approach is no more or less "constructional" than the account in Gawron 2001. That is, each kind of functional head/feature pair amounts to something analogous to what Gawron talks about as a construction. In order to import the selectional analysis of unconditional licensing into a functional head analysis, we would have to end up delineating exactly the same "construction" Gawron delineates, and the functional head analysis gives us exactly the tools to do this. To a certain extent, both analyses fail to make some of the desired predictions exactly because they are "constructional" in this way. Note that such constructional analyses fail completely to make part 1 of the clausal adjunct prediction, from (658) above. They simply predict massive arbitrariness in what kinds of clause can be an adjunct, relative to what can be an argument.

(Of course, with some theory of what constructions are universal, they might start to make predictions; I will not go into this here.)

4.6.6 Evaluation of licensing theories

In this section I have presented three solutions to the clausal adjunct licensing problem, focusing on the domain of (un)conditionals. The first, and the solution I advocate, is a semantic analysis following Ernst 2002. On this solution, the licensing of a complement clause as a clausal adjunct is determined by lexical compatibility with a feature that converts it to the right semantic type. The licensing of clausal adjuncts in general is determined by their type being a modifier type – in some cases this might be governed by features such as COND, and in more cases, this would be lexical. The appearance of a clause as an adjunct is tied directly to its meaning, and not to any formal properties; selection only plays a role for clauses whose types need to be coerced by some operator into a modifier type. The benefits of this analysis are (i) it allows us to keep free syntactic adjunction, with the type system as a filter on what can be adjoined, (ii) it allows us to correctly predict a large class of clauses that can adjoin, and (iii) it allows us to predict the relatively free distribution of clausal adjuncts. Crucially, nothing about the licensing of adjuncts makes reference to any particular features that appear on those adjuncts.

The two competing analyses were the construction-based analysis in Gawron 2001, and a hypothetical functional-head-based analysis along the lines of Cinque 1999. I argued against many of the specifics of Gawron 2001, but adopted the general principle of a licensing feature into the semantic analysis. Neither analysis accomplishes the three benefits of the semantic analysis listed above, and in other respects they are equal. In fact, I showed that the constructional nature of Gawron's 2001 analysis is effectively duplicated in the functional head analysis; in each case adjunction is governed by a licensing formal feature on the constituent that the adjunct attaches to.

This is not to say that there is no notion of "construction" in the analysis advocated here, but it is a semantic, rather than formal, notion. The concept of a conditional construction corresponds to the COND feature, and in particular to the semantics of that feature – importantly, these semantics can also appear in clauses that do not actually involve that feature in particular, such as headed unconditionals.

Now I turn to ways in which all three analyses are deficient. As noted above when discussing the semantic analysis in particular, with respect to the empirical generalizations I have noted about unconditionals, the analyses are not explanatory. None of the analyses offer an adequate explanation of why a polar interrogative cannot adjoin, or why alternative unconditionals always involve disjunction. Gawron 2001 offers an explanation of this fact, but I have argued that it is not adequate, in that it prevents a unification of unconditionals with "if"-conditionals. A more general construction based analysis, or a functional head analysis, offers no explanation.

In the remainder of this chapter, I offer the beginnings of a new explanation of these generalizations.

4.7 Refining the semantic licensing analysis

As discussed earlier, in many languages, polar interrogative clauses can take on the function of conditional adjuncts. When they do, it seems that they never pattern with unconditionals (Haspelmath and König 1998). Alternative interrogatives, on the other hand, do take on unconditional meaning. For the sake of discussion[97], I will assume conversely that polar interrogatives in adjunct position always take on the function of an English "if"-conditional if it takes on any adjunct function (as opposed to other functions that I haven't discussed here, e.g. causation), and that alternative interrogative adjuncts always lead to unconditional meaning.

In fact, English is simultaneously a language where polar "if"-clauses take on an "if"-conditional function, and polar "whether"-clauses do not. Since the typological facts suggest that in principle there is no reason why a "whether"-clause could not do the same as an "if"-clause here, this is an English-specific fact. But it is not at all an English-specific fact that polar "whether"-clauses do not receive an unconditional interpretation, despite the semantic similarity with alternative "whether" clauses with "or not". I suggest here that both of these facts, the English specific one and the general one, have deeper explanations. "If"-clauses and "whether" clauses do have subtle meaning distinctions, as do polar "whether" clauses and alternative "whether" clauses with "or not". These meaning distinctions all take the form of *bias*.

4.7.1 The polar/alternative distinction

A common proposal, introduced in chapter 2, is that polar interrogatives are a special kind of alternative interrogative with a silent "or not" (see e.g. Stockwell et al. 1973; Karttunen 1977a; Larson 1985, as well as the history in Bolinger 1978). This idea is based on apparent synonymy of the two kinds of questions in complement position. It is very hard to see that Alfonso's knowledge state, if (680) is true, is any different than his knowledge state if (681) is true.

(680) Alfonso knows whether it is raining.

(681) Alfonso knows whether it is raining or not.

However, the two kinds of questions are not synonymous. This was shown by Bolinger 1978. I do not present all of Bolinger's arguments here (he gives 12 cases where the two are not synonymous), but I do present five of them.

In requests and invitations, a polar question is much more polite than an "or not" question:

(682) Invitations

a. Do you want some?

b. Do you want some or not?

(683) Requests

a. Would you like to buy a subscription to Mechanix Illustrated?

[97] As far as I know these claims are true, but I've never come across any typological work that addresses them.

b. Would you like to buy a subscription to Mechanix Illustrated or not?

In some cases, the distinction goes beyond politeness. In questions where only one answer is possible, the alternative question is infelicitous.

(684) Questions where only one answer is possible

a. John, are you awake?

b. # John, are you awake or not?

Similar facts hold in cases where, as Bolinger puts it, the speaker does not care about a negative answer. What this means in particular is that only the positive answer is truly informative relative to some larger implicit conversational goal. In the examples Bolinger uses, the speaker implicitly wants to know what day it is, and already has some suspicion. If their suspicion is wrong, simply telling them that won't be the most informative answer – they really want to know what day it is. In this scenario, polar questions but not alternative questions are felicitous.

(685) Questions where the speaker does not care about a negative answer

a. Is today the 17th?

b. # Is today the 17th or not?

English has a (perhaps idiomatic) way of conveying information with questions, using the frame "did you know that...". We cannot use alternative questions in this frame.

(686) Information conveying questions

a. By the way, did you know that Jack Robinson was my cousin?

b. # By the way, did you know that Jack Robinson was my cousin or not?

Finally, the most telling test involves items such as "some" and "often" that introduce a positive bias into a question. That is, the use of "often" in (687a) leads to the belief that the speaker thinks a positive answer is more likely than a negative answer. Such items are not felicitous in an alternative question.

(687) Questions with a positive biasing item (*some, often*)

a. Have you often been there?

b. # Have you often been there or not?

In chapter 2 I discussed several additional distinctions between polar and alternative questions. One was that in English, and some but not all other languages, "doubt"-type verbs take polar but not alternative interrogative complements. (I do not know of any language that does take alternative interrogatives in these cases, but some do not take any type of interrogative at all, preferring declaratives.)

(688) Dubitatives (Karttunen 1977a; Tedeschi 1977)

a. I doubt that/whether/if Alfonso is here.

b. * I doubt whether Alfonso is here or not.

c. * I doubt who is here.

Another was that alternative interrogatives cannot be answered using "yes" and "no", even when their meaning appears very similar to the meaning of a polar interrogative.

Finally, a distinction that is directly about bias can be drawn from Büring and Gunlogson 2000 (see also van Rooy and Safarova 2003). Büring and Gunlogson conclude that positive polar questions express some positive bias. That is, in their terms, they are not compatible with "compelling contextual evidence" against the positive resolution of the question. On the other hand, they are compatible with compelling contextual evidence *for* the positive resolution of the issue. Here is their example:

(689) Scenario: A enters S's windowless computer room wearing a dripping wet raincoat.

a. S: What's the weather like out there? Is it raining?

b. # S: What's the weather like out there? Is it sunny?

To this we can add the observation that alternative questions are not compatible with such evidence for either of the alternatives:

(690) Scenario: A enters S's windowless computer room wearing a dripping wet raincoat. (same as (689))

a. # S: What's the weather like out there? Is it raining or not?

b. # S: What's the weather like out there? Is it sunny or not?

They also aren't compatible with a lack of evidence at all.

(691) Scenario: A enters S's windowless office looking completely dry and normal, and showing no sign of having been outside.

a. # S: What's the weather like out there? Is it raining or not?

b. # S: What's the weather like out there? Is it sunny or not?

To ask this sort of question, there must be some evidence for both alternatives. For example, the scenario in (692) licenses an alternative interrogative:

(692) Scenario: A enters S's windowless office soaked through, but wearing shorts and a T-shirt and looking sunburned. A exclaims, apparently honestly "what a nice day out!"

a. S: What's the weather like out there? Is it raining or not?

b. S: What's the weather like out there? Is it sunny or not?

It is clear from all of these data points that there must be some distinction between the two types of questions. Nearly all of the tests are extremely suggestive of what the distinction might be, in fact. Polar questions have a weak positive bias, whereas alternative questions are unbiased or neutral. These distinctions can be characterized in terms of likelihood, following van Rooy and Safarova 2003. That is, a polar question conveys that the speaker thinks a positive answer is more likely than a negative answer. (How *much* more likely is completely vague, of course.) An alternative question conveys that the speaker thinks that each alternative is equally likely.

Does this lead to any explanation of the inability of polar interrogative clauses to take on unconditional adjunct meanings? It does point to the beginning of one. It is clear from the first part of this chapter that unconditionals are involve variety of free choice. In fact, I suggested there that the relevant sense of "free choice" amounts to a lack of bias with respect to the resolution of certain issues. Therefore it is unsurprising that only an interrogative clause that lacks bias would be suitable to take on this free choice meaning.

Let us now turn to the second piece of the puzzle, the "if"/"whether" distinction.

4.7.2 The "if"/"whether" distinction

Despite the regular appearance of synonymy of "if" and "whether" clauses in complement position, it has been known for some time that the two have different meanings and distributions even in that position. The difference again has to do with bias – "if"-clauses have a stronger positive bias than "whether"-clauses (Tedeschi 1977; Bolinger 1978; Eckardt 2006).

There are a number of ways of empirically distinguishing the two. The first are due to Tedeschi 1977. Tedeschi notes that in verbs of conjecture (Karttunen 1977a), "if"-clauses are worse than "whether"-clauses.

(693) Verbs of conjecture

a. # I couldn't guess if embedded questions are names.

b. I couldn't guess whether (or not) embedded questions are names.

Note that in these and in many examples to follow, some speakers have the intuition that the "if"-clause is acting adjunct-like in some way. The intuition is that a sentence like (693a) has a paraphrase something like "If embedded questions are names, I could not guess that they are names." I think syntactically the "if"-clause clearly has the properties of a complement. For example it is not acceptable to left-adjoin it without placing some other clause in the complement position of the verb (because the verb's subcategorization frame is not satisfied). One possibility is that it has a dual analysis in the sense of Dowty 2003. That is, the parser generates two parallel derivations where the clause semantically acts adjunct-like in one, and argument-like in the other. I will not develop this possibility further here.

Tedeschi also reports a contrast in verbs that "state the relevance of the question to their subject". I report his judgments here; I am not sure that they are entirely stable across speakers.

(694) Verbs of relevance

a. ?* It matters to Tom if marijuana is legalized.

b. It matters to Tom whether (or not) marijuana is legalized.

The next two are due to Bolinger 1978. Verbs of investigation are not compatible with "if"-clauses, but are compatible with "whether"-clauses. Intuitively, this is because they are not compatible with the strong bias of "if"-clauses, but are compatible with the weaker bias of "whether"-clauses.

(695) Verbs of investigation
a. I wish he could justify whether/# if he actually needed the money.
b. They are investigating whether/# if it is true.
c. They were unable to dig up whether/# if it was true.
d. I'm studying whether/# if I should take that line of action.

The two kinds of clauses can both appear as complements of speech-reporting verbs, but the meaning is subtly different. This difference is most clearly seen in the imperative. The implication with the "if"-clause is that the speaker really wants to hear a positive answer.

(696) Verbs of speech (Bolinger)
a. Please tell me if you want to marry me.
b. Please tell me whether you want to marry me.

Adger and Quer 2001 note a similar distinction in the complements of these verbs, which they suggest can lead to infelicity in some scenarios. (Actually, they assume that these sentences are ungrammatical, but I assume that it is a case of infelicity here.) These are cases where the verb patterns with an extensional attitude verb, i.e. they act "factive" in the same way that "know" with an interrogative complement does. Intuitively, when these verbs take an interrogative complement, they are reporting on a claim about the resolution of some issue without actually reporting the claim. Therefore, they are not compatible with a strong bias, because otherwise the speaker should have just reported the claim itself. So (697b) is intuitively bad because it suggests a strong positive bias, where there should be none. (697c) is acceptable because the clausal negation in the root clause results in the verb patterning as an intensional, not extensional attitude verb. That is, the reported speech event involved no positive claim about the resolution of the issue.

(697) a. The bartender told me whether I was drunk.
b. # The bartender told me if I was drunk.
c. Anton did not admit if he was drunk.
d. # Anton admitted if he was drunk.

Finally, Eckardt 2006 reports a distinction in the complements of verbs of decision. Such verbs do not make any requirements on the bias of their complement, but the presence of different degrees of bias results in the sentences being used in different scenarios. The distinction

is that in (698a), Anna has full decision power over both the positive and negative resolution of the issue (whether there will be a party). In (698b), though, she only has full power over the positive resolution. This example might be used in a scenario where a party was scheduled at Anna's house, but several other people had suggested that it should be canceled. Anna has the remaining vote to decide that the party will happen.

(698) Verbs of decision
  a. Anna may decide whether there will be a party.
  b. Anna may decide if there will be a party.

This intuition is subtle, and Eckardt 2006 reports that speakers are unreliable in having it. What I have found is that some speakers (including myself) have fairly reliable intuitions about the distinction, and some don't.[98]

A similar point to the verbs of investigation can be made with perception verbs, especially in questions.

(699) a. Have you noticed if they have any paper towels?
  b. Have you noticed whether they have any paper towels?

(700) a. Have you heard if Alfonso got the job?
  b. Have you heard whether Alfonso got the job?

Intuitively, the sentences involving "if" ask for a different sort of answer than the sentences involving "whether". This is a little clearer with "notice". (699b) asks the hearer whether they have observed the complete resolution of the issue. The example with "if", on the other hand, simply asks about the positive case. A "yes" answer to (699a) means that the answerer has noticed some paper towels. A "yes" answer to (699b), in its most direct sense, means that the answerer has noticed either that they have some paper towels, or that they have none, indicating that the answerer has made some sort of investigation into the negative possibility. This would normally be followed up with a resolution of the larger issue. Another way of putting this is that "yes; they have none" is a felicitous response to (699b), but odd following (699a).

All of these tests again suggest that "if"-clauses are positively biased, and are also more biased in some sense than "whether"-clauses.

4.7.3 The bias scale

Tedeschi 1977 proposes a scale of the strength of bias in embedded alt/polar questions, shown in Table 14. The observations that I have cataloged above strongly support Tedeschi's conclusions.

This picture of the relationship of different kinds of alt/polar interrogative clauses to each other is suggestive of a way of viewing the "if"-conditional/unconditional system. The kinds of clauses that appear as adjuncts are those on the endpoints of this scale. This intuitively fits with

[98] Thanks to the audience at a UCSC S-circle for discussion about this judgment.

	Kind of clause	Kind of bias
1.	Polar *if*-clause	strong positive bias
2.	Polar *whether*-clause	weak positive bias
3.	(Alternative *if*-clause?)	(unbiased?)
4.	Alternative *whether*-clause	unbiased

Table 14: Scale of bias in embedded questions

the kind of meanings involved. Unconditionals, in the role of free choice conditionals, need a clause that lacks bias – so that the choice among alternatives is truly free. "if"-conditionals serve to make a non-exhaustive assumption corresponding to the positive answer to the question. That is, the strong positive bias is a good fit for the kind of meaning involved. In other words, alternative interrogatives make good unconditional adjuncts exactly because they are unbiased, and polar interrogatives make good "if"-conditionals because they are positively biased. "If"-clauses in particular have a stronger bias than simple positive polar questions, making them the preferred case in English. The explanation of the distribution of interrogative clauses in (un)conditional systems and in English in particular, lie in the mapping of elements in the bias scale in table 14 onto the adjunct system.

These results also fits with what is known about the cross-linguistic picture. The lack of bias/free choice in alternative interrogatives is presumably universal, and is likely due to the presence of disjunction. Disjunction is the common denominator for alternative unconditionals (Haspelmath and König 1998), and when we find an interrogative clause in this function it is always an alternative interrogative clause, as opposed to a polar interrogative. Furthermore, in languages with only one kind of polar interrogative, not two, that clause is perfectly compatible with getting an "if"-conditional type meaning. This is expected, as in this languages this clause will be the only kind of positively biased interrogative clause.

In other words, the proposal is that (un)conditionals are subject to optimization pressure. This pressure leads languages to prefer certain kinds of clauses as (un)conditionals, and the synchronic state of English illustrates this.

A similar kind of explanation applies to English constituent unconditionals, as well as to the generalization that constituent unconditionals tend to involve some kind of free choice marking. I have demonstrated in the first part of this chapter that "-ever" questions are unbiased in a sense – they involve equal consideration of even the most unlikely possible ways of resolving the question. Consequently, we might expect them to make better constituent unconditionals than plain constituent interrogative clauses.[99]

[99]This leads to the question of why expletive questions are not used as unconditional adjuncts. The first approximation of an answer is that I would not be surprised to find a language where they are; it just happens that they are not, in English. But it seems from Haspelmath and König 1998 that fully grammaticized unconditionals (e.g. not headed unconditionals) tend to involve a fully grammaticized morphological marking, parallel to English "-ever". That is, the markings tend to be functional, not lexical, they are usually morphologically simple, and they are usually used in a way idiosyncratic to the particular kind of clause. Expletive questions involve at best only the third property; they involve a productive (though somewhat limited) set of expressive DPs, they are not

Note that this kind of explanation leads us to expect a certain amount of arbitrariness in particular grammars, and leads us to expect a synchronic analysis that is not explanatory. That is, the grammar simply contains a stipulation that polar "whether" is not compatible with the feature COND, just as in Table 12. Recall also that we do need some degree of exactly this kind of arbitrariness, in order to account for the grammars of languages where no interrogative clause at all can be adjoined, and alternative unconditionals or "if"-conditionals are formed in a different way.

This idea obviously requires more precise formalization, but I will not provide that here. One idea is to try to express the idea in terms of information theory, following van Rooy 2003; van Rooy and Safarova 2003: if the expected meaning of a polar "whether" clause, when adjoined, leads to a generally lower utility for a conditional sentence in discourse than an "if"-clause, we might expect the grammar to categorically choose one over the other. Regardless of whether this is on the right track, clearly there is much work to do here.

4.7.4 Towards a cross-categorial analysis of "if"-clauses

The idea sketched above points toward an explanation of why particular interrogative clauses can appear as particular types of (un)conditionals. There is a further question of explanation that arises, however. What we must assume (and what I assumed in the semantic analysis summarized in table 12) is that when a polar interrogative clause appears as a conditional adjunct, the question operator disappears. That is, in an adjoined "if"-clause, "if" is not an interrogative complementizer, whereas it is in a complement "if"-clause.

At a first pass we would like an explanation for this analytical point. But it even seems to make a wrong prediction. In particular, it predicts that "if"-conditional adjuncts derived from polar interrogatives will not be interrogative-like in any respect. But this is apparently not true, given well-known instances where conditional adjuncts have been generalized to complement clause polar questions (Romance; Harris 1986). Consequently, we might expect that despite their non-interrogative semantics, "if"-clause-type adjuncts retain their interrogative nature in some sense.

One possibility, that I will sketch but not provide any formal analysis of here, is that the COND operator combines with a question meaning (a partition) but only looks at alternatives of the partition that the question is biased towards. This would produce exactly the right result; a polar interrogative clause would always pattern with the meaning of an "if"-conditional. Given that alternative questions involve neutrality, which I have claimed above is in fact equal bias towards both alternatives, we would also expect the COND operator to have to look at both alternatives in this case.

There is much more to understand here; it is not at all clear what the source of bias is in polar questions or in alternative questions. Previous work on these types of questions (Büring and Gunlogson 2000; van Rooy and Safarova 2003) has stated generalizations about the bias,

morphologically simplex (cf. "what in the name of the son of god"). Further, as I suggested in the first part of the chapter, expletive questions are not typically as "neutral" as "-ever" questions, in that they express some surprise or bias away from what were a priori the most likely possibilities.

but not derived it in any general way. Eckardt 2006 provides a concrete proposal about the strong positive bias in "if"-clauses (that "if" presupposes that the positive alternative is the one that is relevant), but this does not explain the weak positive bias in regular positive polar questions, or the neutrality in alternative questions. It is also not entirely clear how to formalize the idea of COND looking only at the privileged alternatives in a question meaning it combines with. One possibility, following Asher and Reese 2005; Reese 2007, is that bias has some unified linguistic representation at the clausal level, and the COND operator interacts with this representation directly.[100] I will leave a full exploration of this for the future.

[100] One thing which is clear is that this would have to be a property of COND specifically. Headed unconditionals interact with the full question meaning:

(i) Regardless of whether Alfonso comes to the party, it will be fun.

(ii) The govt. assumes an 8% tip, regardless of if the customer gives one. (via Google)

CHAPTER 5 CONCLUSIONS

This chapter briefly sums up the main claims and ideas of the dissertation. The dissertation centers around the analysis of the English unconditional construction.

(701) Whether Alfonso or Joanna brings the salad, it will have feta cheese on it.

(702) Whoever brings the salad, it will have feta cheese on it.

(703) No matter who brings the salad, it will have feta cheese on it.

I will highlight three reasons why understanding this construction is important to linguistic theory. First, our understanding of conditional structures that do not involve "if" is quite limited, despite the fact that conditionals represent a pillar of modern formal semantics, pragmatics, and philosophy of language. Second, this construction is one of the few constructions of English that involves "wh"-morphology whose syntax and semantics has not been extensively studied. Studying unconditionals helps further our understanding of the syntax and semantics of "wh"-constructions. Third, unconditionals are at the confluence of the study of questions, conditionals, modality, and free choice, and form a perfect place to test the interactions of theories of these phenomena.

This first motivation, understanding conditional structures in a generalized sense, has been a guiding focus of the dissertation. One main theoretical result is a unified syntactic and semantic analysis of unconditionals and "if"-conditionals; on this analysis the differences in meaning follow compositionally from the internal structure of the adjuncts. I have argued that unconditional adjuncts denote an "issue", just as a question does, whereas adjoined "if"-clauses denote a proposition. From this difference follows the differences in meaning between the two kinds of sentence. Whereas an issue arising from a root–position clause has the pragmatic effect of asking a question, an issue arising from an adjunct–position clause has the effect of unconditionalizing the proposition given in the main clause. The result is a claim of orthogonality, in Lewis's 1988 terms; instead of proposing that discourse participants resolve an issue, an unconditional claims that its resolution is orthogonal to some more pressing issue (see §3.4.3).

The main result corresponding to the second motivation is that unconditional adjunct involve an unmistakably interrogative structure. In particular, they are syntactically the kind of structure found in root "wh-ever" questions. I have given a unified semantic analysis of "wh-ever" questions and "wh-ever" adjuncts, where the purpose of "-ever" is to widen the intensional domain of interpretation. This morpheme forces discourse participants to consider very unlikely ways of resolving the issue denoted by the "wh-ever" clause. Because this presupposition works on the set of possible worlds under consideration, not the set of individuals under consideration, it is compatible with examples where the set of individuals does not change, such as the reality show example repeated here from chapter 4 (see §4.2.2 for discussion).

(704) Scenario: a reality show is nearing the end of its season. 5 candidates are left, and the competition is fierce. On the task for this episode, all of the competitors do extremely well. It is hard to tell who the judges will pick as the person to send home.

(705) Whoever will they pick?

(706) Who on earth will they pick?

Examples of this kind constitute a major problem for an analysis that relies on the manipulation of any kind of domain of individual under consideration, whereas they are straightforwardly explained under the intensional analysis I have given.

Finally, I have provided an account of unconditionals that shows how an analysis of conditionals following Lewis, Kratzer, and Heim, working together with an analysis of questions inspired by Hamblin, and Groenendijk and Stokhof, can interact in interesting and surprising ways. But in fact, the interactions, on this analysis, follow entirely from the compositional structure of an unconditional. One assumption important to making this work out (in particular, for establishing orthogonality) is the idea that modals, conditionals, question operators, and "wh"-items, all look to a single contextual parameter for their domain – what I have treated here as the context set in the sense of Stalnaker.[101]

At the end of the day, several problems remain open. I have given an analysis of the distribution of interrogative adjuncts that is not entirely explanatory. I have argued that this is, to a certain extent, necessary – it is arbitrary what kinds of clauses a language allows as adjuncts. But within particular classes of adjuncts (e.g. within interrogatives), it is not arbitrary what meanings are possible when the adjuncts adjoin. I have suggested the beginning of an explanation of this problem based on distinctions in bias between different kinds of interrogative clauses. The basic idea is that polar interrogatives, because they have a positive bias, make good "if"-conditionals, and alternative interrogatives, because of their neutrality, make good unconditionals. But much work remains to be done here.

I have begun the process of unifying conditional adjuncts that do not involve "if", and shown how two very different constructions can receive a unified analysis. The center of this unification is the operator Cond, which I have argued provides the conditional meaning, and at the same time constrains the distribution of clauses that appear as both complements and adjuncts. It is a very broad and open question whether this unification can be extended to the full range of conditional adjuncts; some particularly interesting cases are infinitival purpose clauses (which act like conditionals in terms of the tests given in chapter 3), and Stump's 1985 weak adjuncts.

[101] It is not necessary to assume that this parameter is the context set; see Rawlins 2008b for an approach that makes use of an arbitrary conversational background for this purpose. But it is hard to see why the question operator in particular would converge on the same background used by a modal, unless this background were privileged in some way. We know from dynamic accounts of questions (Groenendijk 1999; Isaacs and Rawlins 2008 among others) that questions do in fact target the context set. This suggests that the privileged conversational background of Rawlins 2008b is best thought of as representing the same information as the context set. Since for Stalnaker, the context set derives from the common ground, and the common ground is effectively the extension of a Kratzerian conversational background, this convergence is perhaps not a surprise.

I have discussed the meaning of "-ever" here, but focused on questions and unconditionals, as opposed to free relatives. While I sketched a way of extending the analysis in chapter 4, much work remains to be done. I argued that free relative-type indifference readings are not present in all "wh-ever" constructions, but it is still an open question exactly how their appearance interacts with the meaning of "-ever" in free relatives.

Finally, by focusing on English unconditionals, I have neglected unconditionals of very different types (see chapter 4 for some examples). In particular, a large class of unconditionals uses subjunctive morphology instead of interrogative morphology (Haspelmath and König 1998; Izvorski 2000b). The question remains is to whether these two kinds of unconditional work the same – in what way does the meaning of the subjunctive serve the same function as the meaning of interrogative morphology?

This dissertation contributes to answering the question of what it means to be a conditional in natural language. However, there are many species of conditional that remain largely unexplored. I hope this work will provide a path towards that larger endeavor.

Adger, David, and Josep Quer. 2001. The syntax and semantics of unselected embedded questions. *Language* 77:107–133.

Akatsuka, Noriko. 1985. Conditionals and the epistemic scale. *Language* 61:625–639.

Aloni, Maria, and Robert van Rooy. 2002. The dynamics of questions and focus. In *Proceedings of SALT 12*, ed. B. Jackson. Cornell University: CLC Publications.

Alonso-Ovalle, Luis. 2004. Simplification of disjunctive antecedents. In *Proceedings of the North East Linguistic Society 34*, ed. Keir Moulton and Matthew Wolf, 1–15. University of Massachusetts, Amherst: GLSA.

Alonso-Ovalle, Luis. 2005. Distributing the disjuncts over the modal space. In *Proceedings of the North East Linguistics Society 35*, ed. Leah Bateman and Cherlon Ussery. University of Massachusetts, Amherst: GLSA.

Alonso-Ovalle, Luis. 2006. Disjunction in alternative semantics. Ph.D. dissertation, University of Massachusetts at Amherst.

Alonso-Ovalle, Luis. 2007. Alternatives in the disjunctive antecedents problem. In *Proceedings of WCCFL 26*. Cascadilla Press.

Anderssen, Jan. 2006. Generalized domain widening *überhaupt*. In *Proceedings of WCCFL 25*, ed. Donald Baumer, David Montero, and Michael Scanlon, 58–66. Cascadilla Press.

Artstein, Ron. 2002. A focus semantics for echo questions. In *Workshop on Information Structure in Context*, ed. Agnes Bende-Farkas and Arndt Riester, 98–107.

Asher, Nicholas, and Brian Reese. 2005. Negative bias in polar questions. In *Proceedings of SuB 9*, ed. Emar Maier, Corien Bary, and Janneke Huitink, 30–43.

Atlas, Jay, and Steven Levinson. 1981. *It*-clefts, informativeness, and logical form: Radical pragmatics (revised standard vesion). In *Radical pragmatics*, ed. Peter Cole, 1–61. Academic Press.

Austin, John. 1956a. Ifs and cans. *Proceedings of the British Academy* 42:109–132.

Austin, John L. 1956b. A plea for excuses. In *Proceedings of the Aristotelian Society*. Reprinted in Austin (1961).

Austin, John L. 1961. *Philosophical papers*. Oxford University Press.

Autorenkollektiv. 1981. *Grundzüge einer deutschen Grammatik*. Akademie-Verlag.

van der Auwera, Johan. 1986. Conditionals and speech acts. In *On conditionals*, ed. Elizabeth Traugott, Alice G. B. ter Meulen, Judy Reilly, and Charles Ferguson, 309–331. Cambridge University Press.

Baker, Carl Lee. 1968. Indirect questions in English. Ph.D. dissertation, University of Illinois.

Baker, Carl Lee. 1970. Notes on the description of English questions: the role of an abstract question morpheme. *Foundations of Language* 6:197–219.

Barker, Chris. 2002. Continuations and the nature of quantification. *Natural Language Semantics* 10:211–242.

Barker, Chris. 2005. Possessive weak definites. In *Possessives and beyond: Semantics and syntax*,

ed. Ji-yung Kim, Yury Lander, and Barbara Partee. GLSA Publications.
Bartels, Christine. 1999. *The intonation of English statements and questions*. Garland Publishing.
Barwise, Jon. 1989. Notes on branch points in situation theory. In *The situation in logic*, chapter 11. CSLI.
Barwise, Jon, and John Etchemendy. 1990. Information, infons, and inference. In *Situation theory and its applications I*, ed. Robin Cooper, Kuniaki Mukai, and John Perry, 33–78. CSLI.
Barwise, Jon, and John Perry. 1983. *Situations and attitudes*. MIT Press.
Beaver, David. 1992. The kinematics of presupposition. In *Proceedings of the Eighth Amsterdam Colloquium*, ed. P. Dekker and M. Stokhof. ILLC, University of Amsterdam.
Beaver, David. 2001. *Presupposition and assertion in dynamic semantics*. CSLI Publications and FoLLI.
Beaver, David, and Emiel Krahmer. 2001. A partial account of presupposition projection. *Journal of Logic, Language and Information* 10:147–182.
Beck, Sigrid, and Shin-Sook Kim. 2006. Intervention effects in alternative questions. *Journal of Comparative Germanic Linguistics* 9:165–208.
Bennett, Jonathan. 1982. 'even if'. *Linguistics and Philosophy* 5:403–418.
Bennett, Jonathan. 2003. *A philosophical guide to conditionals*. Oxford University Press.
Bhatt, Rajesh. 2001. Covert modality in non-finite contexts. Ph.D. dissertation, University of Pennsylvania.
Bhatt, Rajesh. 2003. Locality in correlatives. *Natural Language and Linguistic Theory* 21:485–541.
Bhatt, Rajesh, and Roumyana Pancheva. 2006. Conditionals. In *The Blackwell companion to syntax volume I*, 638–687. Blackwell.
Bolinger, Dwight. 1978. Yes-no questions are not alternative questions. In *Questions*, ed. Henry Hiz, 87–105. D. Reidel Publishing Company.
Brasoveanu, Adrian. 2007. Structured nominal reference. Ph.D. dissertation, Rutgers.
Bresnan, Joan. 1972. Theory of complementation in English syntax. Ph.D. dissertation, MIT.
Bruce, Kim, and Donka Farkas. 2007. Context structure for dialogues. Manuscript, Pomona/UCSC.
Büring, Daniel, and Christine Gunlogson. 2000. Aren't positive and negative polar questions the same? UCSC/UCLA.
Cable, Seth. 2007. The grammar of q: Q-particles and the nature of Wh-fronting, as revealed by the Wh-questions of Tlingit. Ph.D. dissertation, MIT.
Caponigro, Ivano. 2000. Free relatives as DPs with a silent D and a CP complement. In *Proceedings of WECOL 2000*, ed. Vida Samiian.
Caponigro, Ivano. 2003. Free not to ask: On the semantics of free relatives and wh-words cross-linguistically. Ph.D. dissertation, UCLA.
Chao, Wynn. 1987. On ellipsi. Ph.D. dissertation, UMass Amherst.
Cheng, Lisa, and Anastasia Giannakidou. to appear. The non-uniformity of wh-indeterminates with free choice in Chinese. In *Strategies of quantification*, ed. Georges Tsoulas and Kook hee Gil. Oxford University Press.
Cheng, Lisa, and James Huang. 1996. Two types of donkey sentence. *Natural Language*

Semantics 4:121–163.
Chierchia, Gennaro. 2004. Scalar implicatures, polarity phenomena and the syntax/pragmatics interface. In *Structures and beyond. the cartography of syntactic structures*, ed. Adriana Belletti, 39–103. Oxford University Press.
Chierchia, Gennaro. 2005. Scalar implicatures, polarity phenomena and the syntax/pragmatics interface. Manuscript, Universita degli Studi di Milano.
Chung, Sandra, and William Ladusaw. 2004. *Restriction and saturation*. MIT Press.
Cinque, Guglielmo. 1999. *Adverbs and functional heads: A cross-linguistic perspective*. Oxford University Press.
Cinque, Guglielmo. 2004. Issues in adverbial syntax. *Lingua* 114. Special Issue: Taking Up the gauntlet - Adverbs across frameworks.
Comrie, Bernard. 1986. Conditionals: A typology. In *On conditionals*, ed. Elizabeth Traugott, Alice G. B. ter Meulen, Judy Reilly, and Charles Ferguson, 215–228. Cambridge University Press.
Condoravdi, Cleo. 2005. Not knowing or caring who. Manuscript.
Cooper, Robin. 1979. The interpretation of pronouns. In *Syntax and semantics 10: Selections from the third Groningen round table*, ed. F. Heny and H. S. Schnelle, 61–92. Academic Press.
Davies, Mark. 2004-. Byu-bnc: The British National Corpus. Available online at http://corpus.byu.edu/bnc.
Davies, Mark. 2008-. Corpus of american english: 360 million words, 1990-present. Available online at http://www.americancorpus.org.
Dayal, Veneeta. 1995. Quantification in correlatives. In *Quantification in natural languages*, ed. Emmon Bach, Eloise Jelinek, Angelika Kratzer, and Barbara Partee, volume 1, 179–205. Kluwer Academic Publishers.
Dayal, Veneeta. 1996. *Locality in WH quantification: Questions and relative clauses in Hindi*. Studies in Linguistics and Philosophy. Kluwer Academic Publishers.
Dayal, Veneeta. 1997. Free relatives and *ever*: Identity and free choice readings. In *Proceedings of SALT 7*, 99–116.
Declerck, Renaat, and Susan Reed. 2001. *Conditionals: A comprehensive empirical analysis*. Mouton de Gruyter.
Depiante, Mercela. 2000. The syntax of deep and surface anaphora: A study of null complement anaphora and stripping/bare argument ellipsis. Ph.D. dissertation, University of Connecticut.
Diesing, Molly. 1992. *Indefinites*. MIT Press.
den Dikken, Marcel, and Anastasia Giannakidou. 2002. From *Hell* to polarity: "aggressively non-d-linked" *Wh*-phrases as polarity items. *Linguistic Inquiry* 33:31–61.
Donnellan, Keith S. 1966. Reference and definite descriptions. *The Philosophical Review* 281–304.
Dowty, David. 2003. The dual analysis of adjuncts/complements in categorial grammar. In *Modifying adjuncts*, ed. Ewald Lang, Catherine Fabricius-Hansen, and Claudia Maienborn. Mouton de Gruyter.
Eckardt, Regine. 2006. The syntax and pragmatics of embedded yes/no questions. In *On*

information structure, meaning and form, ed. Kerstin Schwabe and Susanne Winkler, 447–466. John Benjamins.
Elbourne, Paul. 2001. E-type anaphora as NP-deletion. *Natural Language Semantics* 9:241–288.
Elbourne, Paul. 2005. *Situations and individuals*. MIT Press.
Embick, David, and Rolf Noyer. 2001. Movement operations after syntax. *Linguistic Inquiry* 32.
Ernst, Thomas. 2002. *The syntax of adjuncts*. Cambridge University Press.
Evans, Gareth. 1977. Pronouns, quantifiers, and relative clauses (I). *Canadian Journal of Philosophy* 7:467–536.
Evans, Gareth. 1980. Pronouns. *Linguistic Inquiry* 2:337–362.
Farkas, Donka. 1982. Intensionality and Romance subjunctive relatives. Ph.D. dissertation, University of Chicago.
Farkas, Donka. 2003. Assertion, belief and mood choice. Presented at ESSLLI, Conditional and Unconditional Modality Workshop, Vienna.
Farkas, Donka, and Yoko Sugioka. 1983. Restrictive if/when clauses. *Linguistics and Philosophy* 6:225–258.
Fillmore, Charles. 1963. The position of embedding transformations in a grammar. *Word* 19.
von Fintel, Kai. 1994. Restrictions on quantifier domains. PhD dissertation, University of Massachusetts, Amherst.
von Fintel, Kai. 2000. Whatever. In *Proceedings of SALT 10*, 27–40.
von Fintel, Kai. 2001a. Conditional strengthening: a case study in implicature. Manuscript, MIT.
von Fintel, Kai. 2001b. Counterfactuals in a dynamic context. In *Ken Hale: A life in language*, ed. Michael Kenstowicz. MIT Press.
von Fintel, Kai, and Sabine Iatridou. 2002. If and when "if"-clauses can restrict quantifiers. Manuscript, MIT.
von Fintel, Kai, and Sabine Iatridou. 2005. What to do if you want to go to Harlem: Anankastic conditionals and related matters. Manuscript, MIT.
von Fintel, Kai, and Lisa Matthewson. to appear. Universals in semantics. *The Linguistic Review* .
Fox, Danny. 2006. Free choice and the theory of scalar implicatures. manuscript, MIT.
Gawron, Jean Mark. 2001. Universal concessive conditionals and alternative NPs in english. In *Logical perspectives on language and information*, ed. Cleo Condoravdi and Gerard Renardel de Lavalette. CSLI Publications.
Gazdar, Gerald. 1979. *Pragmatics: Implicature, presuppositons, and logical form*. Academic Press.
Geach, Peter. 1962. *Reference and generality*. Cornell University Press.
Geis, Michael, and Arnold Zwicky. 1971. On invited inferences. *Linguistic Inquiry* 2.
Geis, Michael L. 1973. *If* and *Unless*. In *Issues in linguistics: Papers in honor of Henry and Renée Kahane*, ed. Braj Kachru, Robert Lees, Yakov Malkiel, Angelina Petrangeli, and Sol Saporta. University of Illinois Press.
Geis, Michael L. 1985. The syntax of conditional sentences. In *Studies in generalized phrase structure grammar*, ed. Michael L. Geis, 130–159. Ohio State University.

Giannakidou, Anastasia, and Lisa Cheng. 2006. (in)definiteness, polarity, and the role of wh-morphology in free choice. *Journal of Semantics* 23:135–183.
Gillies, Anthony. 2007. Iffiness. Manuscript, University of Michigan.
Grice, H. Paul. 1975. Logic and conversation. In *Syntax and semantics 3: Speech acts*, ed. Peter Cole and Jerry Morgan, 41–58. Academic Press.
Groenendijk, Jeroen. 1999. The logic of interrogation. In *Proceedings of SALT IX*, ed. T. Matthews and D. L. Strolovitch. Ithaca, NY: CLC Publications.
Groenendijk, Jeroen, and Martin Stokhof. 1984. Studies in the semantics of questions and the pragmatics of answers. PhD dissertation, University of Amsterdam.
Groenendijk, Jeroen, and Martin Stokhof. 1990. Partitioning logical space. Annotated handout, ESSLI.
Groenendijk, Jeroen, and Martin Stokhof. 1997. Questions. In *Handbook of logic and language*, ed. J. van Benthem and A. ter Meulen, 1055–1124. Elsevier/MIT Press.
Groenendijk, Jeroen, Martin Stokhof, and Frank Veltman. 1996. Coreference and modality. In *Handbook of contemporary semantic theory*, ed. S. Lappin, 179–216. Blackwell.
Grosu, Alexander. 2003. A unified theory of 'standard' and 'transparent' free relatives. *Natural Language and Linguistic Theory* 21:247–331.
Guerzoni, Elena. 2003. Why *Even* ask? Ph.D. dissertation, Massachusetts Institute of Technology.
Guerzoni, Elena. 2006. Intervention effects on NPIs and feature movement: towards a unified account of intervention. *Natural Language Semantics* 14:359–398.
Guerzoni, Elena, and Dongsik Lim. 2007. *Even if*, factivity and focus. In *Proceedings of SuB 11*, ed. E. Puig-Waldmüller, 276–290.
Gunlogson, Christine. 1999. True to form: Rising and falling declaratives as questions in english. PhD thesis, UC Santa Cruz.
Haegeman, Liliane. 2003. Conditional clauses: External and internal syntax. *Mind & Language* 18:317–339.
Hagstrom, Paul. 1998. Decomposing questions. Ph.D. dissertation, MIT.
Haiman, John. 1978. Conditionals are topics. *Language* 54:564–589.
Haiman, John. 1986. Constraints on the form and meaning of the protasis. In *On conditionals*, ed. Elizabeth Traugott, Alice G. B. ter Meulen, Judy Reilly, and Charles Ferguson, 215–228. Cambridge University Press.
Halle, Morris. 1997. Distributed morphology: Imporverishment and fission. In *MITWPL 30*, ed. B. Bruening, Y. Kang, and M. McGinnis, 425–449. MIT Working Papers in Linguistics.
Hamblin, C. L. 1973. Questions in montague english. *Foundations of Language* 10:41–53.
Han, Chung-hye, and Maribel Romero. 2004. The syntax of *whether/Q...or* questions: ellipsis combined with movement. *Natural Language and Linguistic Theory* 22:527–564.
Hankamer, Jorge, and Ivan Sag. 1976. Deep and surface anaphora. *Linguistic Inquiry* 7:391–426.
Harris, Martin. 1986. The historical development of *si*-clauses in Romance. In *On conditionals*, ed. Elizabeth Traugott, Alice G. B. ter Meulen, Judy Reilly, and Charles Ferguson, 265–284. Cambridge University Press.

Haspelmath, Martin. 1997. *Indefinite pronouns*. Oxford University Press.
Haspelmath, Martin, and Ekkehard König. 1998. Concessive conditionals in the languages of Europe. In *Adverbial constructions in the languages of Europe*, ed. Johan van der Auwera. Mouton de Gruyter.
Heim, Irene. 1982. The semantics of definite and indefinite noun phrases. PhD dissertation, University of Massachusetts, Amherst.
Heim, Irene. 1983. On the projection problem for presuppositions. In *WCCFL 2: Second Annual West Coast Conference on Formal Linguistics*, ed. M. Barlow, D. Flickinger, and M. Wescoat, 114–125. Stanford, CA: CSLI.
Heim, Irene. 1990. E-type pronouns and donkey anaphora. *Linguistics and Philosophy* 13:137–177.
Heim, Irene. 1992. Presupposition projection and the semantics of attitude verbs. *Journal of Semantics* 9:183–221.
Heim, Irene, and Angelika Kratzer. 1998. *Semantics in generative grammar*. Blackwell.
Heller, Daphna. 2005. Identity and information: Semantic and pragmatic aspects of specificational sentences. Ph.D. dissertation, Rutgers.
Heller, Daphna, and Lynsey Wolter. 2008. Identity and indeterminacy in *-ever* free relatives. Paper presented at SALT 18.
Higginbotham, James. 1993. Interrogatives. In *The view from building 20*, ed. Ken Hale and Samuel Keyser. The MIT Press.
Hinterwimmer, Stefan. 2007. *If* vs. *when*, *wenn* vs. *als*: microvariation in the semantics of conditional and temporal complementizers in English and German. In *Proceedings of NELS 37*, ed. Emily Elfner and Martin Walkow.
Hirschberg, J. 1985. A theory of scalar implicature. Ph.D. dissertation, University of Pennsylvania.
Horn, Larry. 1989. *A natural history of negation*. University of Chicago Press.
Horn, Laurence. 2000a. From *if* to *iff*: Conditional perfection as pragmatic strengthening. *Journal of Pragmatics* 32:289–326.
Horn, Laurence. 2000b. Pick a theory (not just any theory). In *Negation and polarity*, ed. Laurence Horn and Yasuhiko Kato, 147–192. Oxford University Press.
Huddleston, Rodney, and Geoffrey K. Pullum. 2002. *The cambridge grammar of the english language*. Cambridge: Cambridge University Press.
Huitink, Janneke. 2005. Anankastic conditionals and salient goals. In *Proceedings of SuB 9*, ed. Emar Maier, Corien Bary, and Janneke Huitink.
Iatridou, Sabine. 1991. Topics in conditionals. Ph.D. dissertation, MIT.
Iatridou, Sabine. 1994. On the contribution of conditional *then*. *Natural Language Semantics* 2:171–199.
Ippolito, Michela. 2003. Presuppositions and implicatures in counterfactuals. *Natural Language Semantics* 11:245–286.
Ippolito, Michela. 2007. On the meaning of some focus-sensitive particles. *Natural Language Semantics* 15:1–34.
Isaacs, James, and Kyle Rawlins. 2008. Conditional questions. *Journal of Semantics* 25:269–319.

Izvorski, Roumyana. 1996. The syntax and semantics of correlative proforms. In *Proceedings of NELS 26*, ed. Kiyomi Kusumoto, 133–147.
Izvorski, Roumyana. 2000a. Free adjunct free relatives. In *WCCFL 19*, 232–245. Cascadilla Press.
Izvorski, Roumyana. 2000b. Free relatives and related matters. Ph.D. dissertation, University of Pennsylvania.
Jacobson, Pauline. 1995. On the quantificational force of English free relatives. In *Quantification in natural languages*, ed. Emmon Bach, Eloise Jelinek, Angelika Kratzer, and Barbara Partee, 451–486. Kluwer Academic Publishers.
Jespersen, Otto. 1909–1949. *A modern English grammar on historical principles*. George Allen & Unwin Ltd.
Johnson, Kyle. 1996/2004. In search of the English middle field. Manuscript, UMass Amherst.
Johnson, Kyle. 2000. Few dogs eat whiskas or cats alpo. In *UMOP 23: Issues in semantics and its interfaces*, ed. Kiyomi Kusumoto and Elisabeth Villalta, 59–82. GLSA Publications.
Kadmon, Nirit. 1987. On unique and non-unique reference and asymmetric quantification. PhD dissertation, University of Massachusetts, Amherst.
Kadmon, Nirit, and Fred Landman. 1993. Any. *Linguistics and Philosophy* 16:353–422.
Kamp, Hans. 1981. A theory of truth and semantic representation. In *Formal methods in the study of language: Proceedings of the Third Amsterdam Colloquium*, ed. J. Groenendijk, T. Jannsen, and M. Stokhof.
Kaplan, Abby. 2007. Syntactic sensitivity of movement, ellipsis, and scope: Evidence from discontinous coordination. Qualifying Paper, UCSC.
Kaplan, Abby. 2008. The proper role of movement and ellipsis in discontinuous coordination. In *Proceedings of WCCFL 26*.
Kaplan, David. 1999. What is meaning? explorations in the theory of *Meaning as Use*, brief vesion.
Karttunen, Lauri. 1973. Presuppositions of compound sentences. *Linguistic Inquiry* 4:167–193.
Karttunen, Lauri. 1974. Presuppositions and linguistic context. *Theoretical Linguistics* 1:181–193.
Karttunen, Lauri. 1977a. Syntax and semantics of questions. *Linguistics and Philosophy* 1:3–44.
Karttunen, Lauri. 1977b. To doubt whether. In *The CLS book of squibs*. Chicago Linguistics Society.
Karttunen, Lauri, and Stanley Peters. 1976. What indirect questions conventionally implicate. In *CLS 12*.
Kay, Paul, and Charles Fillmore. 1999. Grammatical constructions and linguistic generalizations: The what's X doing Y? construction. *Language* 75:1–33.
Klinedinst, Nathan. 2004. *Ever*-concessives as question quantifiers. Talk given at the UCSC Modality Workshop, Jun 5, 2004.
Klinedinst, Nathan. 2007. Plurality and possibility. Ph.D. dissertation, UCLA.
König, Ekkehard. 1985. On the history of concessive connectives in English. diachronic and synchronic evidence. *Lingua* 66:1–19.
König, Ekkehard. 1986. Conditionals, concessive conditionals and concessives: areas of con-

trast, overlap and neutralization. In *On conditionals*, ed. Elizabeth Traugott, Alice G. B. ter Meulen, Judy Reilly, and Charles Ferguson, 229–246. Cambridge University Press.
König, Ekkehard. 1988. Concessive connectives and concessive sentences: cross-linguistic regularities and pragmatic principles. In *Explaining language universals*, ed. John Hawkins, 145–166. Blackwell.
Kratzer, Angelika. 1977. What 'must' and 'can' must and can mean. *Linguistics and Philosophy* 1:337–355.
Kratzer, Angelika. 1981. The notional category of modality. In *Words, worlds, and contexts: New approaches in world semantics*, ed. Hans-Jürgen Eikmeyer and Hannes Rieser, 38–74. Berlin: Walter de Gruyter.
Kratzer, Angelika. 1986. Conditionals. In *Proceedings of CLS 22*.
Kratzer, Angelika. 1989. An investigation of the lumps of thought. *Linguistics and Philosophy* 12:607–653.
Kratzer, Angelika. 1991. Modality. In *Semantics: an international handbook of contemporary research*, ed. A. von Stechow and D. Wunderlich, 639–650. Berlin and New York: Mouton de Gruyter.
Kratzer, Angelika. 1996. Severing the external argument from its verb. In *Phrase structure and the lexicon*, ed. J. Rooryck and L. Zaring. Kluwer Academic Publishers.
Kratzer, Angelika. 1999. Beyond *ouch* and *oops*: How descriptive and expressive meaning interact. a comment on David Kaplan's paper. Cornell Conference on Theories of Context Dependency.
Kratzer, Angelika. 2002. Facts: particulars or information units? *Linguistics and Philosophy* 25:655–670.
Kratzer, Angelika. 2004. Covert quantifier restrictions in natural languages. Slides for talk given at the 2004 Milan Meeting.
Kratzer, Angelika. 2005a. Constraining premise sets for counterfactuals. *Journal of Semantics* 22:153–158.
Kratzer, Angelika. 2005b. Indefinites and their operators. In *Reference and quantification: the Partee effect*, ed. Gregory Carlson and Francis Jeffry Pelletier. CSLI.
Kratzer, Angelika. 2008. Situations in natural language semantics. In *The Stanford encyclopedia of philosophy (spring 2008 edition)*, ed. Edward N. Zalta.
Kratzer, Angelika, and Junko Shimoyama. 2002. Indeterminate pronouns: The view from japanese. In *Proceedings of the 3rd Tokyo conference on psycholinguistics*, ed. Yukio Otsu, 1–25. Hituzi Syobo.
Krifka, Manfred. 1995. The semantics and pragmatics of polarity items. *Linguistic Analysis* 25:1–49.
Kruijff-Korbayova, Ivana, and Bonnie Webber. 2001. Concession, implicature and alternative sets. In *Proceedings of the International Workshop on Computational Semantics (IWCS-4), Tilburg*.
Kuroda, S.-Y. 1965. Generative grammatical studies in the Japanese language. Ph.D. dissertation, MIT.
Ladusaw, William. 1992. Expressing negation. In *Proceedings of SALT II*, ed. Chris Barker and

David Dowty, 237–259.
Ladusaw, William. 2004. Biased questions. Talk at UCSC.
Lahiri, Utpal. 2002. *Questions and answers in embedded contexts*. Oxford University Press.
Larson, Richard. 1985. On the syntax of disjunction scope. *Natural Language and Linguistic Theory* 3:217–264.
Levinson, Stephen. 1983. *Pragmatics*. Cambridge University Press.
Lewis, David. 1973. *Counterfactuals*. Blackwell. Revised printing 1986.
Lewis, David. 1975. Adverbs of quantification. In *Formal semantics of natural language*, ed. Edward L. Keenan. Cambridge University Press.
Lewis, David. 1979. Scorekeeping in a language game. *Journal of Philosophical Logic* 8:339–359.
Lewis, David. 1981. Ordering semantics and premise semantics for counterfactuals. *The Journal of Philosophical Logic* 10:217–234.
Lewis, David. 1988. Relevant implication. *Theoria* 54:161–237.
Lin, Jo-wang. 1996. Polarity licensing and wh-phrase quantification in Chinese. Ph.D. dissertation, UMass Amherst.
Link, Godehard. 1983. The logical analysis of plural and mass terms: A lattice-theoretical approach. In *Meaning, use, and the interpretation of language*, ed. R. Bauerle, C. Schwarze, and A. von Stechow, 302–323. Mouton de Gruyter.
Lycan, William. 1991. *Even* and *even if*. *Linguistics and Philosophy* 14:115–150.
Lycan, William. 2001. *Real conditionals*. Oxford University Press.
Martí, Luisa. 2003. Contextual variables. Ph.D. dissertation, University of Connecticut.
Matsui, Ai. 2008. Constructing concessive conditionals in Japanese. M.A. thesis, Michigan State University.
McCawley, James. 1991. Contrastive negation and metalinguistic negation. In *Proceedings of CLS 27*.
McCawley, James. 1998. *The syntactic phenomena of English*. University of Chicago Press.
Meier, Cécile. 2003. The meaning of *too, enough,* and *so ... that*. *Natural Language Semantics* 11:69–107.
Menéndez-Benito, Paula. 2006. The grammar of choice. Ph.D. dissertation, University of Massachusetts at Amherst.
Merchant, Jason. 2003. Remarks on stripping. Manuscript, University of Chicago.
Merchant, Jason. 2006. Why no(t)? *Style* 40:20–23.
Merin, Arthur. 2007. Unconditionals. Manuscript, University of Konstanz.
Morzycki, Marcin. 2001. Interpreting measure DP adverbials. In *Proceedings of WCCFL 20*, ed. K. Megerdoomian and L. A. Bar-el. Cascadilla Press.
Morzycki, Marcin. 2004. Measure dp adverbials: Measure phrase modification in VP. Manuscript, Université du Québec à Montréal.
Neale, Stephen. 1990. *Descriptions*. The MIT Press.
Nissenbaum, Jon. 2005. Kissing Pedro Martinez: (existential) anankastic conditionals and rationale clauses. In *Proceedings of SALT XV*.
Nute, Donald. 1975. Counterfactuals and the similarity of worlds. *Journal of Philosophy* 72:773–778.

Parsons, Terence. 1978. Pronouns as paraphrases. Ms, University of Massachusetts, Amherst.
Partee, Barbara. 1986. Noun phrase interpretation and type-shifting principles. In *Studies in discourse representation theory and the theory of generalized quantifiers*, ed. J. Groenendijk, D. de Jongh, and M. Stokhof, 115–143. Foris Publications.
Partee, Barbara. 1991. Topic, focus, and quantification. In *SALT 1*, ed. Steven Moore and Adam Wyner, 159–187.
Partee, Barbara. 1995. Quantificational structures and compositionality. In *Quantification in natural languages*, ed. Emmon Bach, Eloise Jelinek, Angelika Kratzer, and Barbara Partee, 541–601. Kluwer Academic Publishers.
Partee, Barbara, and Mats Rooth. 1983. Generalized conjunction and type ambiguity. In *Meaning, use, and the interpretation of language*, ed. Rainer Bäurle, Christoph Schwarze, and Arnim von Stechow, 361–393. Walter de Gruyter & Co.
Percus, Orin. 2000. Constraints on some other variables in syntax. *Natural Language Semantics* 8:173–229.
Pesetsky, David. 1982. Paths and categories. Ph.D. dissertation, Massachusetts Institute of Technology.
Pesetsky, David, and Esther Torrego. 2007. The syntax of valuation and the interpretability of features. In *Phrasal and clausal architecture*, ed. S. Karimi, V. Samiian, and W. Wilkins. John Benjamins.
Poesio, Massimo. 1994. Weak definites. In *Proceedings of the Fourth Conference on Semantics and Linguistic Theory*, ed. Mandy Harvey and Lynn Santelmann. CLC Publications.
Potts, Chris. 2003. The logic of conventional implicatures. PhD dissertation, UC Santa Cruz.
Pruitt, Kathryn. 2008. Mapping prosody to interpretation in alternative questions. Paper presented at CUNY conference on human sentence processing.
Pullum, Geoffrey, and Kyle Rawlins. 2007. Argument or no argument? *Linguistics and Philosophy* 30:277–287.
Pullum, Geoffrey K. 1973. What's a sentence like this doing showing up in english? *York Papers in Linguistics* 3:113–115.
Quirk, Randolph. 1985. *A comprehensive grammar of the English language*. Addison-Wesley.
Ramchand, Gillian. 1997. Questions, polarity, and alternative semantics. In *Proceedings of NELS 27*, 383–396.
Ramsey, Frank P. 1931. General propositions and causality. In *The foundations of mathematics: Collected papers of Frank P. Ramsey*, ed. R.B. Braithwaite, 237–255. London: Routledge and Kegan Paul.
Rawlins, Kyle. 2005. Possessive definites and the definite article. Manuscript, UCSC.
Rawlins, Kyle. 2006. Bare concessive disjunction. Qualifying Exam, UCSC.
Rawlins, Kyle. 2008a. Unifying 'illegally'. In *Event structures in linguistic form and interpretation*, ed. Johannes Dölling, Tatjana Heyde-Zybatow, and Martin Schäfer, Language, Context and Cognition, 81–102. Mouton de Gruyter.
Rawlins, Kyle. 2008b. Unifying *if*-conditionals and unconditionals. In *Proceedings of SALT 18*. CLC Publications.
Recanati, Francois. 1996. Domains of discourse. *Linguistics and Philosophy* 19:445–475.

Recanati, Francois. 2004. Descriptions and situations. In *Descriptions and beyond*, ed. Marga Reimer and Anne Bezuidenhout, 15–40. Oxford University Press.
Reese, Brian. 2007. Bias in questions. Ph.D. dissertation, UT Austin.
Reynolds, Nicholas. 2007. *Whatever* and free choice: Beyond episodicity. M.A. thesis, UC Santa Cruz.
Rooth, Mats. 1985. Association with focus. Doctoral Dissertation, UMass Amherst.
Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics* 1:75–116.
van Rooy, Robert. 2003. Negative polarity items in questions: Strength as relevance. *Journal of Semantics* 20:239–273.
van Rooy, Robert, and Marie Safarova. 2003. On polar questions. In *Proceedings of SALT XIII*. CLC Publications.
Ross, John Robert. 1967. Constraints on variables in syntax. Ph.D. dissertation, MIT.
Ross, John Robert. 1970. Gapping and the order of constituents. In *Progress in linguistics*, ed. Manfred Bierwisch and Karl Heidolph, 249–259. Mouton.
Rudolph, Elisabeth. 1996. *Contrast*. Walter de Gruyter.
Sag, Ivan. 1980. *Deletion and logical form*. Garland Publishing.
Sauerland, Uli. 2004. Scalar implicatures in complex sentences. *Linguistics and Philosophy* 27:367–391.
Schein, Barry. 2001. Adverbial, descriptive reciprocals. In *Proceedings of SALT XI*, ed. Rachel Hastings, Brendan Jackson, and Zsofia Zvolenszky. Cornell University Press.
Schlenker, Philippe. 2004. Conditionals as definite descriptions (a referential analysis). *Research on Language and Computation* 2:417–162.
Schulz, Katrin. 2008. Non-deictic tenses in conditionals. Paper presented at SALT 18.
Schwarz, Bernhard. 1999. On the syntax of *either ...or*. *Natural Language and Linguistic Theory* 17:339–370.
Schwarzschild, Roger. 1999. Givenness, AvoidF and other constraints on the placement of accent. *Natural Language Semantics* 7:141–177.
Schwenter, Scott. 1999. The pragmatics of conditional marking. Ph.D. dissertation, Stanford University.
Shimoyama, Junko. 2001. Wh-constructions in Japanese. Ph.D. dissertation, UMass Amherst.
Siegel, Muffy. 2006. Biscuit conditionals: Quantification over potential literal acts. *Linguistics and Philosophy* 29:167–203.
Simons, Mandy. 2005. Dividing things up: The semantics of *or* and the modal/*or* interaction. *Natural Language Semantics* 13:271–316.
Srivastav, Veneeta. 1991a. The syntax and semantics of correlatives. *Natural Language and Linguistic Theory* 9:637–686.
Srivastav, Veneeta. 1991b. Wh dependencies in Hindi and the theory of grammar. Ph.D. dissertation, Cornell University.
Stalnaker, Robert. 1970. Pragmatics. *Synthese* 22(1-2):272–289.
Stalnaker, Robert. 1973. Presuppositions. *Journal of Philosophical Logic* 2:447–457.
Stalnaker, Robert. 1974. Pragmatic presuppositions. In *Semantics and philosophy*, ed. M. K. Munitz and P. K. Unger. New York University Press.

Stalnaker, Robert. 1975. Indicative conditionals. *Philosophia* 5:269–286.
Stalnaker, Robert. 1978. Assertion. In *Pragmatics*, ed. Peter Cole, 315–332. New York: Academic Press.
Stalnaker, Robert. 1988. Belief attribution and context. In *Contents of thought*, ed. Robert Grimm and Daniel Merrill. University of Arizona Press.
Stalnaker, Robert. 1998. On the representation of context. *Journal of Logic, Language and Information* 7:3–19.
von Stechow, Arnim. 1991. Focusing and backgrounding operators. In *Discourse particles*, ed. W. Abraham. John Benjamins.
von Stechow, Arnim, Sveta Krasikova, and Doris Penka. 2005. Anankastic conditionals. Handout, University of Tübingen.
Stockwell, Robert, Paul Schachter, and Barbara Partee. 1973. *Major syntactic structures of English*. Holt, Rinehart and Winston.
Stump, Gregory. 1985. *The semantic variability of absolute constructions*. D. Reidel Publishing Company. Revised version of Stump's 1981 OSU dissertation.
Tedeschi, Philip. 1977. Complementizers and conditionals. In *Proceedings of CLS 13*, 629–639.
Traugott, Elizabeth. 1983. Conditional markers. In *Iconicity in syntax*, ed. John Haiman, 289–310. John Benjamins.
Tredinnick, Victoria. 2005. On the semantics of free relatives with -ever. Ph.D dissertation, University of Pennsylvania.
Veltman, Frank. 1976. Prejudices, presuppositions, and the theory of counterfactuals. In *Amsterdam papers in formal grammar. proceedings of the 1st Amsterdam colloquium*, ed. Jeroen Groenendijk and Martin Stokhof, 248–281. University of Amsterdam.
Vlachou, Evangelia. 2007. *Free choice in and out of context*. LOT.
Westerstahl, Dag. 1984. Determiners and context sets. In *Generalized quantifiers and natural language*, ed. Johan van Benthem and Alice G. B. ter Meulen, 45–71. Foris Publications.
Wolter, Lynsey. 2006. Definite determiners and domain restriction. In *Proceedings of NELS 36*.
Xrakovskij, Victor S., ed. 2005. *Typology of conditional constructions*. LINCOM Europa.
Zabbal, Youri. 2004. A compositional semantics of the French expression *n'importe qu*. Generals Paper, UMass Amherst.
Zaefferer, Dietmar. 1987. Unconditionals. Paper read at the Conference on Logic and Linguistics, sponsored by the Association for Symbolic Logic and the Linguistic Society of America.
Zaefferer, Dietmar. 1990. Conditionals and unconditonals in universal grammar and situation semantics. In *Situation theory and its applications I*, ed. Robin Cooper, Kuniaki Mukai, and John Perry, 471–492. CSLI.
Zaefferer, Dietmar. 1991. Conditionals and unconditionals: Cross-linguistic and logical aspects. In *Semantic universals and universal semantics*, ed. Dietmar Zaefferer. Foris Publications.
Zimmermann, Thomas Ede. 2000. Free choice disjunction and epistemic possibility. *Natural Language Semantics* 8:255–290.
Zwicky, Arnold. 1985. Clitics and particles. *Language* 61:283–305.
Zwicky, Arnold, and Geoffrey Pullum. 1983. Cliticization vs. inflection: English *n't*. *Language*

59:502–513.