Unifying *if*-conditionals and unconditionals

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1. Overview

Conditionals involving the word "if", such as (1) are one of the most semantically well-studied structures in the English language. But there are also many other conditional-like constructions that have received barely any attention. This paper is about one such "if"-less conditional, which I will refer to as an unconditional.[1] Representative unconditional sentences are given in (2-5).

(1) If Alfonso comes to the party, it will be fun. *"if"-conditional*

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

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

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

(5) Regardless of / No matter who comes to the party, it will be fun.
Headed unconditional

Unconditionals have much in common with "if"-conditionals. The structures of unconditional and "if"-conditional sentences are similar; we have a clausal adjunct that seems to take scope high in the main clause. Unconditionals, I will argue, are similar to "if"-conditionals in that both kinds of adjuncts trigger restrictions on the domains of operators in their scope (in the sense of Lewis 1975).

However, it is obvious that unconditionals and "if"-conditionals are different in a range of ways. Unconditionals entail their consequent, whereas "if"-conditionals typically do not. Unconditionals also convey what I will refer to as "indifference": that e.g. it doesn't matter who comes to the party.

Previous work on unconditionals has focused on capturing the differences, without truly capturing the similarities. I develop an analysis that treats "if"-conditionals and unconditionals as exactly the same species of adjunct. Both, following Lewis 1975, Kratzer 1981, 1986, Heim 1982, serve semantically to restrict the domains of operators in their scope. The differences follow from their internal semantics.

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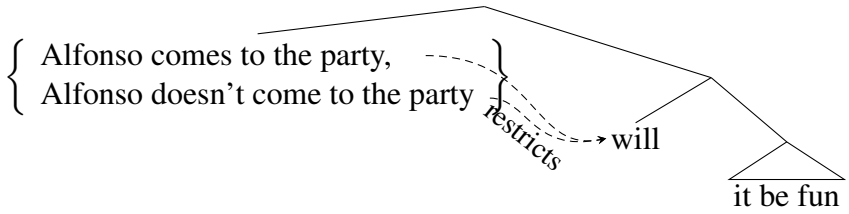
[1] The term is due to Zaefferer 1990; they are also commonly referred to as concessive conditionals.

Adjoined "if"-clauses denote propositions. But unconditionals, because of the semantic contribution of the interrogative morphology they contain, denote the same kind of object as a root question (following Zaefferer 1990, 1991, Lin 1996, Izvorski 2000b). I will refer to this kind of object as an "issue". It is the distinction between propositions and issues that leads to the difference in meaning. An issue encodes a set of alternatives, corresponding to the possible answers to the question (Hamblin 1958, 1973, Karttunen 1977, Groenendijk and Stokhof 1984), whereas a proposition involves only a single alternative. What alternatives there are compose in a "pointwise" way (in the sense of Hamblin 1973, Kratzer and Shimoyama 2002) with the main clause they adjoin to. That is, each alternative composes in turn. A singleton alternative will act as if composition weren't pointwise at all. But a set of alternatives well lead to a set of domain restrictions. Because of the interpretation of a question, we know that these alternatives exhaust the possibilities (Groenendijk and Stokhof 1984, 1997). An exhaustive set of potential domain restrictions will convey that the choice of alternative doesn't matter, and at the same time result in the consequent being entailed.

The basic idea of pointwise domain restriction is illustrated graphically for an alternative unconditional (11).

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



I formulate the details of the analysis in a compositional Hamblin semantics (Hamblin 1973, Kratzer and Shimoyama 2002). In this framework, all denotations are alternative sets; the standard type system is orthogonal to the use of alternatives. This allows for a uniform type for adjoined "if"-clauses and unconditional adjuncts – both are of type $\langle st \rangle$. The distinction lies in the size of alternative set; an adjoined "if"-clause denotes a singleton set, and an unconditional adjunct, a non-singleton set. Composition then happens via Hamblin's Pointwise Function Application. The basic idea is similar to the analysis of disjunctive antecedents to counterfactual "if"-conditionals in Alonso-Ovalle 2004, 2006, 2007. I take modals to give rise to a non-triviality presupposition; universal modal claims are not true in virtue of lack of evidence. In the context of an unconditional on the analysis I have sketched, these non-triviality presuppositions become more interesting. The presupposition projects once for each alternative, and we get the composite presupposition that each alternative is non-trivial relative to the domain of quantification. This amounts to a presupposition that the alternatives are distributed (in the sense of Kratzer and Shimoyama 2002) throughout the modal domain. The distribution accounts for an important and characteristic use of unconditionals in discourse, to avoid taking a stance on an interlocutor's claim:

(12) (Scenario: managers discussing the fate of Alfonso.)

A: Alfonso is good at his job.

B: Whether or not he's good at his job, we have to transfer him.

In this discourse, speaker B uses an unconditional to avoid accepting A's claim – it is dismissed as irrelevant.

The remainder of the paper fills in the details. I first discuss some arguments that unconditional adjuncts involve interrogative structure (as opposed to, e.g. free relative structure), and then discuss some arguments that they pattern with conditional adjuncts. I then give a compositional analysis of unconditionals that builds on these structural arguments.

2. The interrogative structure of unconditional adjuncts

2.1. Alternative unconditional adjuncts

(13) Whether Alfonso or Joanna is bringing the salad, it will have feta cheese on it.

(14) Henry asked whether Alfonso or Joanna is bringing the salad.

Alternative unconditional adjuncts have all the superficial properties of an alternative interrogative: they have interrogative morphology ("whether"), they have a necessary disjunction, and they obligatorily carry the intonational pattern of an alternative interrogative (pitch accents on non-final disjuncts, final falling pitch; see Bartels 1999).[2]

To develop the argument further, we can look at some idiosyncratic properties of alternative interrogative clauses. Merchant 2003 identifies a class of constructions that participate in "negative stripping", where there is TP ellipsis in a position following a high clausal negation. Some negative stripping constructions involve no remnant other than the negation, and alternative interrogatives are one of these. Unconditionals undergo the same kind of ellipsis. Even more characteristic of (embedded) alternative interrogative clauses (as opposed to disjunction constructions or negative stripping constructions) is the appearance of "or not" adjacent to "whether". Alternative unconditional adjuncts participate in this alternation as well.

(15) a. Alfonso wondered whether the party was canceled or was not canceled.

b. Alfonso wondered whether the party was canceled *or not*.

c. Alfonso wondered whether *or not* the party was canceled.

(16) a. Whether the party is canceled or is not canceled, we should go out tonight.

b. Whether the party is canceled *or not*, we should go out tonight.

c. Whether *or not* the party is canceled, we should go out tonight.

[2]The pitch contour is of course not obligatory on examples like (14), but without it they are polar interrogatives, not alternative interrogatives.

This pattern would be highly unexpected if the structure of the adjoined clause were not the same as the structure of an embedded alternative interrogative: an interrogative CP. Furthermore, there is no evidence for any additional unpronounced structure; this argues against an approach like Gawron 2001, where alternative unconditional adjuncts involve a nominal structure with a covert "-ever" morpheme.

2.2. Constituent unconditional adjuncts

While alternative unconditional adjuncts like superficially like alternative interrogatives, the situation is not so straightforward with constituent unconditional adjuncts. There are three analyses that are *a priori* plausible. Such adjuncts might involve the structure of a free relative, as in (17); this has been proposed by Dayal 1997, Izvorski 2000a,b. An adjoined relative analysis is reminiscent of correlative constructions in languages such as Hindi (see Srivastav 1991, Dayal 1995, Bhatt 2003 and many others). If unconditionals were a kind of correlative, the analysis would be quite different than the one I end up pursuing – they are typically treated as binding an individual variable in the main clause.

(17) Whoever comes to the party will have fun.

Unconditionals might also have the structure of a root "-ever" question, such as (18). An interrogative analysis has been proposed by Zaefferer 1990, 1991 and Lin 1996 for a similar construction in Mandarin Chinese, but the explicit connection to "-ever" questions is new here.[3]

(18) Whatever happened to Alfonso?

Finally, we might imagine that they involve some otherwise unknown structure. Gawron 2001 proposes that the structure of a constituent unconditional adjunct is in between a nominal relative-like clause, and an interrogative clause, having some properties of both. (Gawron also proposes the same structure for what are normally called "-ever" free relatives, but not for free relatives without "-ever".)

I present arguments here for the interrogative approach, and against any kind of nominal, correlative, or free relative approach.

The first and most straightforward argument is based on the "What was X doing Y" idiom (Pullum 1973, Kay and Fillmore 1999). Huddleston and Pullum 2002 note (§5.3.6 fn. 17) that this idiom is acceptable in interrogatives but not free relatives, and that it is also acceptable in unconditionals.

(19) What were they doing reading her mail?

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

[3]The presence of "-ever", while it does not distinguish between free relatives and interrogatives, does tell us that we are not dealing with other "wh"-constructions, such as relative clauses or "wh"-exclamatives.

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

This pattern would be highly unexpected on a free relative analysis. It would also be unexpected on any kind of hybrid analysis; the idiom appears to occupy the entire clause.[4]

The second argument is based on an old test for the free relative/interrogative distinction, due to Jespersen 1909 (see also Baker 1968, and for some more recent discussion, Caponigro 2003). When an interrogative is replaced with a "wh"-item, either in forming a regular question or an echo question, the "wh"-item chosen must be "what". When a free relative is so replaced, the "wh"-item must match the head of the free relative.

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

(23) 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 not so straightforward to apply to unconditionals, because it is not easy to question or echo question an entire clausal adjunct. There is a very interesting echo pattern that does arise:

(24) 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?

"Regardless of" generally takes an interrogative complement.[5] If an unconditional adjunct involved a free relative structure, we'd expect B's echo question to be not licensed. (We might or might not expect B′'s question to be licensed as well, but given the interrogative selection, this is not so surprising.) The licensing of B's echo question would be extremely surprising on a free relative account of unconditionals. It would also be surprising on any hybrid account where an unconditional adjunct acted outwardly nominal (e.g. Gawron 2001). (At the same time, this data strongly validates the assumption that headed and non-headed unconditionals are closely related.)

The third test involves the appearance of multiple "wh" in unconditionals (Izvorski 2000b, Gawron 2001, Huddleston and Pullum 2002, Grosu 2003). This is something we do not find in English free relatives, and something we would generally not expect in any nominal construction where the "wh"-pronoun serves

[4]Of course, this point is not entirely conclusive without a complete theory of the licensing of idioms such as this, and I will not try to settle this problem here.

[5]Actually, this simplifies: it has a concessive reading along the lines of "despite" adjuncts when it takes a DP that is not a concealed question, and an unconditional meaning when it takes a question.

as the head. We of course find multiple "wh" in interrogative structures such as (25).

(25) Alfonso knows who said what.

(26) * Alfonso talked to who(ever) said what. (*free relative*)

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

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

Once again, this is problematic for a free relative or any kind of nominal analysis. Izvorski 2000a,b notes the problem and concludes from it that free relatives must involve a CP structure. But if there is no independent reason to assume a free relative structure in the first place (and I do not know of any), the more plausible conclusion is that unconditionals simply do not involve a free relative structure.

As noted earlier, English constituent unconditionals are reminiscent of correlative constructions in languages such as Hindi (Dayal 1996). I have provided several conclusive arguments against any kind of relative approach; but we can also argue against a correlative approach in particular. Correlative constructions typically involve an obligatory main-clause proform bound by the adjunct. English unconditionals can freely and productively have no such proform.

One final point is that the simple fact that alternative and constituent unconditionals pattern together leads to an interrogative analysis. From all of this evidence, the conclusion that constituent unconditionals pattern with interrogatives, and most closely with root "wh-ever" interrogatives, is inescapable. They are clearly not adjoined free relatives, and they are clearly not correlatives.

3. The conditionality of unconditionals

The vast majority of research on unconditionals has suggested, in one way or another, that unconditionals and "if"-conditionals are closely related (König 1986, Zaefferer 1990, 1991, Lin 1996, Dayal 1997, Haspelmath and König 1998, Izvorski 2000b, Gawron 2001, Huddleston and Pullum 2002). But there has been no consensus on exactly how the two constructions are related. The predominant view, among accounts that are explicit about this, is that the two converge in terms of truth-conditions (Zaefferer 1990, Lin 1996, Dayal 1997, Gawron 2001). That is, the logical representations of unconditionals and "if"-conditionals are similar or parallel in some way. Izvorski 2000a,b proposes that unconditionals are weak adjuncts in the sense of Stump 1985. This may be correct, but it does not answer any questions – the term "weak adjunct" is a label for a category that is not well-understood. Further, unconditionals do not show the stage-level requirement that distinguishes Stump's weak and strong adjuncts.

I propose here that the constructions involve literally the same species of adjunct. Both "if"-conditionals and unconditionals are a species of adjunct that serve

to restrict the domains of operators in their scope. Their external composition proceeds along identical principles. First, we must establish that the general direction of analysis is plausible; the remainder of this section gives reasons to believe that the two should be unified.

The primary reason that previous researchers have classed the two together is that intuitively, they have very similar meanings. On the one hand, this is a fairly reliable intuition for native speakers to have. On the other, we might want some more precise reasoning. One way of refining this intuition is that unconditionals tend to have close paraphrases involving sequences of "if"-conditionals (König 1986, Lin 1996, Haspelmath and König 1998):

(29) a. Whether or not Alfonso comes, we should have some vegetarian food at the party.

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

(30) 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.

Of course, the paraphrase of a constituent unconditional is hard to list in a short or finite period of time without employing meta-linguistic devices like "...".

3.1. Unconditionals and operator domains

A second way of refining this intuition concerns the interactions of unconditionals with operator domains. Lewis 1975 makes an empirical observation that has proven highly compelling to following analyses of "if"-conditionals, in the linguistics literature at least. Adverbs of quantification (and modal operators; cf. Kratzer 1981 etc.) are context sensitive. The observation is that "if"-clauses and related adjuncts have an impact on domains of quantification for such operators, domains that are otherwise contextually determined. This observation is illustrated by the following paradigm (modified from some of Lewis' examples):

(31) My roof *often* leaks.

(32) If it rains, my roof *often* leaks.

(33) If it rains hard, my roof *often* leaks.

In (31), we might infer a contextual domain restriction to situations where it is raining – many of these situations are ones where the roof leaks. (32) makes this restriction explicit. (33) shows that "if"-conditionals can force a particular restriction – only in situations where it rains hard does the speaker claim that many situations involve a leaky roof. It may not leak at all unless it is raining hard. The same effect occurs with modals (Kratzer 1977, 1981, 1986, 1991):

(34) We *should* have some vegetarian food at the party.

(35) If Alfonso is thinking of coming, we *should* have some vegetarian food at the party.

"Should" in this case is a necessity modal expressing something like the speaker's desires or wishes. In (34) the speaker expresses a desire to have some vegetarian food that is not obviously relativized to particular situations (except that they must be at the party). The "if"-conditional in (35) serves restrict the domain of the modal claim. The speaker may well not desire/wish that there be vegetarian food at the party in situations where Alfonso does not attend. Only in cases where he does, does the speaker want there to be vegetarian food.

A closely related effect occurs with unconditionals. They too interact with the domains of operators, though the interaction is not obviously one of restriction:

(36) Whether or not Alfonso is coming to the party, we *should* have some vegetarian food.

(37) Whoever is coming to the party, we *should* have some vegetarian food.

Each of these sentences expresses a modal claim and explicitly makes it independent of whether Alfonso is coming, or who is coming in general. For (36), instead of the adjunct forcing us to only zoom in on some particular part of the operator's domain, we have to look at parts of the domain both where Alfonso is coming to the party, and parts where he is not. Zaefferer 1990 describes this effect as the removal of background assumptions, in contrast to the introduction of them by "if"-conditionals.

That this is an operator-domain interaction can be probed by attempting to combine unconditional and "if"-conditional adjuncts. Such combinations are felicitous only when the domain restriction provided by the unconditional is orthogonal to the the alternatives involved in the unconditional.

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

(39) Whether or not Alfonso comes to the party, if the party is at Joanna's house, you *should* come.

The above data demonstrates that both kinds of adjuncts interact with the domains of operators. But it is not yet obvious whether they do the same kind of thing to an operator domain. We know from von Fintel 1994 that there are other operations besides restriction (exception, in the case of "unless"-adjuncts), so one possibility is that unconditionals do something genuinely new. The analysis I develop in the next section does not involve a new operation, however, and I show that in fact unconditionals do involve the same kind of domain restriction. The difference is that "if"-conditionals involve just one restriction, and unconditionals involve many.

3.2. The domain expansion problem

At this point I take it for granted that unconditionals are a species of conditional. Before moving on to the details of my analysis, I briefly present a problem that many analyses relying on this assumption are susceptible to, including much previous work.

There is a method of analyzing unconditionals that has been used by a range of different researchers. This is to produce a semantic representation involving some standard logical representation of conditionals (either as a binary logical operator in some possible world semantics, or a tripartite structure following Heim 1982). What corresponds to the antecedent of an "if"-conditional, on this family of analysis, contains the disjunction of alternatives in the unconditional adjunct. A translation of this kind (that does not correspond to any particular analysis) is given in (41), representing the logical version of this approach. The tripartite version can be straightforwardly inferred.

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

(41) $(\text{comes}(\text{the party})(a) \vee \neg\text{comes}(\text{the party})(a)) \Rightarrow \text{fun}(\text{the party})$

This kind of analysis (and I take Zaefferer 1990, Lin 1996, Gawron 2001 to fall into this category in a broad sense) attempts to derive conditional-like truth-conditions for an unconditional, and as such I take it to be on the right track. However, there is a major problem. The problem is that for just about every analysis of conditionals, such a representation will involve a vacuous conditional claim. This is because the alternatives involved will always be exhaustive.

A simple (straw-man) case is the material implication analysis for $\Rightarrow$: it is straightforward to see that $(p \vee \neg p) \rightarrow q$ is equivalent to q. The problem is more interesting for a modal analysis of "if"-conditionals along the lines of Kratzer 1981, 1986. There, the domain for the modal is calculated by intersection with the proposition in the antecedent. A disjunction proposition with exhaustive alternatives will be the entire set of worlds. The intersection of any set with $\mathscr{W}$ is that set. Consequently, the triviality result is preserved for this kind of conditional analysis as well.

The moral of the domain expansion problem is that to analyze unconditionals, we must either do something other than collect the alternatives in the antecedent (producing a proposition that is guaranteed to be the entire contextual domain), or compute operator domains via set intersection. I will take the first route here; via the formal tools of a compositional Hamblin semantics, I will allow the alternatives to "escape" the antecedent of an unconditional.

4. Analysis

Ideally, on a compositional analysis of some complex construction, the meaning of the whole should be derivable from independently motivated meanings for each of

the parts. In the first part of the paper, I have motivated some of the crucial parts. In particular, I have argued that unconditional adjuncts involve interrogative syntax, and conditional meaning & syntax. Some other parts of unconditionals are more obvious: we have disjunction in alternative unconditionals, and a "wh-ever" item in a constituent unconditional. The challenge now is to show how meanings for these pieces can combine.

4.1. Disjunction and interrogative pronouns

I develop the analysis in the framework of compositional Hamblin semantics (Hamblin 1973, Kratzer and Shimoyama 2002). On this theory, all denotations are sets. For many cases, we can ignore the sets and concentrate on their contents – objects described by a standard type theory. The denotation of a regular noun or verb, on this theory, would be a singleton set containing a property. A definite description would be a singleton set containing an individual. Some lexical items, on the other hand, introduce non-singleton alternative sets into composition. These alternative sets can be manipulated by alternative-aware operators later in composition. For instance, the Hamblin existential operator takes a set of propositions A, and returns a singleton set containing the proposition that is true if any proposition in A is true. The Hamblin universal operator would give the singleton set containing a proposition that is true if all propositions in A are true.

On a Hamblin-like account of disjunction, "or" introduces alternatives into composition (Alonso-Ovalle 2005, Simons 2005, Alonso-Ovalle 2006) by giving the set containing the disjuncts. A similar proposal has been made in the literature on focus and alternative questions (von Stechow 1991, Beck and Kim 2006). For example, a disjunction of two names gives an alternative set containing the two individuals. A disjunction of two clauses gives an alternative set containing the two propositions denoted by the clauses.

(42) $[\![\textbf{Alfonso or Joanna}]\!]^{g,w,c} = \{\text{Alfonso}, \text{Joanna}\}$

(43) $[\![\textbf{Alfonso comes to the party or Alfonso doesn't come to the party}]\!]^{g,w,c} =$
$$\left\{ \begin{array}{l} \lambda w' \,.\, \text{Alfonso comes to the party in } w', \\ \lambda w' \,.\, \text{Alfonso doesn't come to the party in } w' \end{array} \right\}$$

In the normal case (which unconditionals are not), the Hamblin operator that would collect the alternatives produced by disjunction is existential. The result of this combination is, when viewed from the outside, a classical inclusive treatment of disjunction. In an alternative question, and therefore an alternative unconditional, the operator in question will be a question operator, and the result will be different (see below).

Interrogative pronouns also introduce alternatives into composition on the Hamblin analysis.

(44) $[\![\textbf{whoever}]\!]^{g,w,c} = \{x \,|\, x \text{ is human}\}$

In this paper I do not discuss the role of "-ever", though it is extremely important. See Rawlins 2008 for an account of its contribution to root "-ever" questions and

unconditionals; the proposal there is that it marks intensional domain widening, where the set of possible worlds being quantified over is presupposed to be as wide as possible.

An important piece of the compositional Hamblin analysis is pointwise function application. In general, because denotations are sets, we need to have a procedure for combining a set of functions with a set of arguments. Such combinations happen in a pointwise way – each function combines with each arguments, and the result is a set containing all of the combinations. For present purposes, three special cases will be important. When a singleton set containing a function and a singleton set containing an argument combine, the result is another singleton set containing that argument applied to that function. When a set of functions combines with a singleton set containing an argument, the result is a set of functions with that argument applied to each function in turn. When a singleton set containing a function combines with a set of arguments, the reverse case happens, and we get a set containing each argument applied in turn to the function. The general procedure is given in (45).

(45) **Hamblin Pointwise function application** (Kratzer and Shimoyama)
If α is a branching node with daughters β and γ, and $[\![\beta]\!]^{w,g} \subseteq D_\sigma$ and $[\![\gamma]\!]^{w,g} \subseteq D_{\langle\sigma\tau\rangle}$, then $[\![\alpha]\!]^{w,g} \underset{\text{def}}{=}$
$$\{a \in D_\tau \mid \exists b \exists c\,[b \in [\![\beta]\!]^{w,g} \wedge c \in [\![\gamma]\!]^{w,g} \wedge a = c(b)]\}$$

This will allow us to take disjunctions of individuals, such as (42), and combine them with a VP to build a set of propositions:

(46) $[\![$**[$_{\text{TP}}$ Alfonso or Joanna comes to the party]**$]\!]^{g,w,c} =$
$$\left\{ \begin{array}{l} \lambda w'\,.\,\text{Alfonso comes to the party in } w', \\ \lambda w'\,.\,\text{Joanna comes to the party in } w' \end{array} \right\}$$

Assuming that "wh-ever" items reconstruct at LF, the exact same procedure applies to "wh-ever" pronouns. (This is a simplifying assumption for presentational purposes; see Rawlins 2008 for more discussion. What we really need to ensure is that they introduce their alternatives in the scope of the question operator.) The difference is representational: it is not easy to list the alternatives.

(47) $[\![$**[$_{\text{TP}}$ Whoever comes to the party]**$]\!]^{g,w,c} =$
$$\{p \mid \exists x \in \{y \mid y \text{ is human}\} : p = \lambda w'\,.\,x \text{ comes to the party in } w'\}$$

4.2. Alternatives and the question operator

As mentioned above, in the case of interrogative clauses, alternatives introduced by disjunction or a "wh-ever" item interact with a question operator. Kratzer and Shimoyama 2002 give two alternative denotations for a question operator: one following Hamblin, and one following Groenendijk and Stokhof 1984. I will use the Hamblin version here, but shortly modify it to bring it more in line with Groenendijk and Stokhof's theory. The Hamblin-style question operator given by K&S is trivial;

it lets alternatives through. For alternative questions and unconditionals we need a more complicated version – it must presuppose that the alternatives mentioned are the only options (Karttunen and Peters 1976, Rawlins 2008; contra Karttunen 1977 and Groenendijk and Stokhof 1984). The version I will use here is given in (48).[6]

(48) **Question operator with exhaustivity** $[\![\textbf{[Q [}\alpha\textbf{]]}]\!]^{g,w,c} =_{\text{def}} [\![\alpha]\!]^{g,w,c}$

defined on g, w, c only if

$$\forall w' \in \bigcap f_c(w) : \exists p_{\langle st \rangle} \in [\![\alpha]\!]^{g,w,c} : p(w')$$

Where f_c is a salient conversational background.

The presupposition is that the alternatives making up the denotation of α exhaust the domain. Here, the notion of "domain" is represented by a conversational background (in the sense of Kratzer 1981). The presupposition ensures that every world in the intersection of the c.b. at the index is contained in some alternative in the denotation of α. This presupposition would be satisfied for an alternative question like (49), for instance, if every world in the salient domain involves either Alfonso or Joanna coming to the party.

(49) Will Alfonso or Joanna come to the party?

(50) $[\![\textbf{whether Alfonso or Joanna comes to the party}]\!]^{g,w,c} =$

$$\{\lambda w' \,.\, \text{A. comes to the party } w',\ \lambda w' \,.\, \text{J. comes to the party in } w'\}$$

defined for g, w, and c only if

$$\forall w'' \in \bigcap f_c(w) : \exists p_{\langle st \rangle} \in \left\{ \begin{array}{l} \lambda w' \,.\, \text{A. comes to the party in } w', \\ \lambda w' \,.\, \text{J. comes to the party in } w' \end{array} \right\} : p(w'') = 1$$

This completes the internal semantics of an unconditional adjunct. In assuming a question meaning for the adjunct I am following Lin 1996 and to some extent Gawron 2001. The next question is how this interacts with the meaning of a conditional, and this is where my analysis differs substantially from previous approaches. The goal is to solve the domain expansion problem described above.

4.3. Conditional meaning

Following what Partee 1991 calls the Lewis-Kratzer-Heim theory of "if"-conditionals (Lewis 1975, Kratzer 1981, 1986, Heim 1982), I assume here that the function of a conditional adjunct is to restrict the domain of operators in its scope. This strand of research elevates Lewis' empirical observation discussed earlier to the center of the analysis.

There are many ways to implement this idea; the general problem is compositionally getting the content of the conditional adjunct to the modal in its scope. The unification of unconditionals with "if"-conditionals is compatible with any of these implementations. Here I use a binding/correlative-type analysis (Geis 1985,

[6] For a more complete analysis, we would also need the presupposition that the alternatives do not overlap, i.e. are mutually exclusive. See Rawlins 2008 for discussion.

von Fintel 1994, Schlenker 2004, Bhatt and Pancheva 2006).[7] The basic idea is that a conditional adjunct binds a variable that provides a restriction to a main-clause modal. A conditional adjunct is intuitively something like a definite description or free relative over possible worlds.

The specific implementation I will use here involves an LF λ operator to mediate the binding:

(51) $[\![\lambda_i[\alpha]]\!]^{g,w,c} = \left\{\lambda p_{\langle st\rangle} \,.\, [\![\alpha]\!]^{g/1\rightarrow p,w,c}\right\}$

I take the simplest approach to the question of what the variable is; operators such as modals carry an index and this index is used in their interpretation (cf. the more elaborate version in von Fintel 1994). So a modal like "should", in its circumstantial reading, will carry an index that can be bound:

(52) $[\![\textbf{should}_i]\!]^{g,w,c} = \left\{\lambda p_{\langle st\rangle} \,.\, \lambda w' \,.\, \forall w'' \in ([\bigcap f_c(w')] \cap g(i)) : p(w'')\right\}$
defined on w', g, w, c only if
$[\bigcap f_c(w')] \cap g(i) \neq \emptyset$ (*non-triviality*)
where f_c is a contextually provided circumstantial c.b.

This is a traditional singly-relativized (i.e. non-ordered) denotation for a modal along the lines of Kratzer's work. It returns true if the proposition is true at all the worlds in the circumstantial background intersected with the set of worlds provided by the index *i*. I have also introduced a non-triviality presupposition, which prevents a modal claim from being true in virtue of lack of worlds in the domain. This is non-controversial for a modal operator, but will become important in the context of an unconditional.

An entire main clause with this index abstracted would look as follows:

(53) $[\![\lambda_1$ **[the party should$_1$ be fun]**$]\!]^{g,w,c} =$
$\left\{\lambda p_{\langle st\rangle} \,.\, \lambda w' \,.\, \forall w'' \in ([\bigcap f_c(w')] \cap p) : \text{the party is fun in } w''\right\}$
defined on w', g, w, c only if
$[\bigcap f_c(w')] \cap p \neq \emptyset$ (*non-triviality*)
where f_c is a contextually provided circumstantial c.b.

As expected, this denotation is a singleton set; there are no items in the main clause that would introduce alternatives.

We are now in a position to combine the main clause with the unconditional adjunct. The main clause is a singleton set containing a function from propositions to propositions. An unconditional adjunct will be a set containing propositions. The two combine via pointwise FA, and in fact instantiate one of the special cases I outlined earlier. Each proposition in the antecedent denotation combines with the main clause in turn.

Consider the example of (50) above. The denotation of the alternative interrogative clauses is a set containing two propositions, one where Alfonso comes to

[7] However, see Rawlins 2008 for an analysis which involves the conditional adjunct shifting the context; for purposes of unification it simply does not matter which approach is taken.

the party, and one where Joanna does. Each of these provides a pointwise domain restriction to the main-clause "should":

(54) $[\![$**[whether Alfonso or Joanna comes to the party] [λ_1 [it should$_1$ be fun]]**$]\!]^{g,w,c} =$

$$\left\{ \begin{array}{l} \lambda w' . \forall w'' \in ([\bigcap f_c(w')] \cap (\lambda w''' . \text{A. comes in } w''')) : \text{the party is fun in } w'', \\ \lambda w' . \forall w'' \in ([\bigcap f_c(w')] \cap (\lambda w''' . \text{J. comes in } w''')) : \text{the party is fun in } w'' \end{array} \right\}$$

defined for g, w, c only if

$$\forall w'' \in \bigcap f_c(w) : \exists p_{\langle st \rangle} \in \left\{ \begin{array}{l} \lambda w' . \text{A. comes to the party in } w', \\ \lambda w' . \text{J. comes to the party in } w' \end{array} \right\} : p(w'')$$

First alternative defined for w', c only if

$[\bigcap f_c(w')] \cap (\lambda w''' . \text{A. comes to the party in } w''') \neq \emptyset$

Second alternative defined for w', c only if

$[\bigcap f_c(w')] \cap (\lambda w''' . \text{J. comes to the party in } w''') \neq \emptyset$

Where f_c is a salient circumstantial conversational background.

The result is a set of modal propositions, and a presupposition that the antecedent alternatives exhaust the domain. I am assuming that the exhaustiveness presupposition applies to the modal domain used in interpreting the main-clause modal. The analysis works identically for constituent unconditionals, though for reasons of space I will not give an example here. The difference is that instead of a set containing two modalized propositions, we get a set containing many modalized propositions, one for each element in the denotation of the "wh-ever" item.

If the adjunct were an "if"-clause, with a singleton set denotation, the result would be once again a singleton set containing just one modal claim.

At this point, we are nearly done. The remaining step is to convert the denotation into a singleton set containing a proposition. This is necessary as the entire sentence is declarative, despite the interrogative syntax in the adjunct. Following Menéndez-Benito 2006 (see §3.7), I take the Hamblin universal operator to be a default operator, inserted up to interpretability. To prevent a singleton set denotation here, a universal operator must be inserted.

(55) Where α has a denotation of type $\langle st \rangle$,
$[\![\forall[\alpha]]\!]^{g,w,c} \underset{\text{def}}{=} \{\lambda w' . \forall p \in [\![\alpha]\!]^{g,w,c} : p(w')\}$

The effect of the Hamblin $\forall$ operator is something like a generalized conjunction operator. Menéndez-Benito 2006 makes this proposal for handling an entirely different case, sentences with a subject free choice item, and no generic aspect.

In the present case, the effect is to convert the denotation in (54) into a singleton set containing a single proposition that is true just in case both of the modal claims are true.

4.4. Discussion

The indifference implication of an unconditional, on this analysis, amounts to the claim that for any possible way of restricting the domain, the main clause proposi-

tion comes out true. That is, it follows from nontrivial, exhaustive, domain restriction. For exactly the same reasons, the fact that the consequent of an unconditional is entailed follows; in aggregate over the entire set of alternatives, we consider every part of the modal space, and find that the consequent proposition is true in all of them.

The non-triviality presupposition, while simple in the case of a single modal operator, projects form this structure as something more interesting. It ensures that each alternative is non-trivial relative to the modal domain; in other words, that the alternatives are distributed throughout the modal space, and each one is a possibility. This accounts for the use of unconditionals in discourse I highlighted at the beginning of the paper, where the unconditional is used to avoid taking a stance on an issue:

(56) (Scenario: managers discussing the fate of Alfonso.)

A: Alfonso is good at his job.

B: Whether or not he's good at his job, we have to transfer him.

In this example, B presupposes that it is possible that Alfonso is good at his job, relative to what we have to do. Because the consequent is entailed, and the particular consequent here addresses a large issue in discourse (Alfonso's fate), the unconditional moves the discussion of the larger issue forward while setting aside A's proposal as not mattering.

The analysis unifies "if"-conditionals and unconditionals: the exact same external syntax and semantics is assumed. Unconditionals and conditional adjuncts both bind a domain variable on an operator in their scope. The differences follow from the internal structures of the two kinds of adjuncts. Because English unconditionals involve interrogative syntax, they also involve the meaning of a question and its corresponding presuppositions. Their meaning involves a set of alternatives; this set combines pointwise with the main clause, contributing a set of domain restrictions. An adjoined "if"-clause, on the other hand, denotes a singleton set containing a proposition. It introduces no exhaustivity presupposition, and contributes only one domain restriction. Type-wise, both kinds of adjuncts are type $\langle st \rangle$.

5. Conclusions

This paper provides a compositional analysis of unconditionals where every piece is independently motivated. Unconditional meaning follows from the fact that the antecedent denotes an issue, not a proposition. The distinction between "if"-conditionals and unconditionals falls out from the distinction between question meanings and propositions, in a compositional Hamblin system. It is the compositional Hamblin system that provides the technical tools: pointwise function application, and a uniform semantic type for interrogative and "if"-clauses.

I have been implicitly assuming a general theory of what it means to be a conditional:

(57) **Lewis-Kratzer-Heim Generalized**
A conditional adjunct is any adjunct that serves to restrict the domain of an operator.

Both unconditionals and "if"-conditionals fall into this category. But does anything else? In fact even in just English there is a large class of conditional-like adjuncts that remain poorly understood, despite the large amount of work on "if"-clause adjunct (see e.g. Stump's 1985 weak adjuncts). We cannot truly understand conditionals until we move beyond "if"-clause adjuncts; this work provides one step in that direction.

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