

o OVERVIEW

- “If”-conditionals: one of the best-studied constructions in natural language semantics.
- (1) If you make a salad, you should put feta cheese on it.
- However, vast inventory of conditional-like constructions in natural language, many of which don’t involve “if”. Two examples:
- (2) Standing on a chair, Alfonso can touch the ceiling. (Stump 1985)
- (3) To get to Harlem, you have to take the A-train. (von Stechow and Iatridou 2005 inter alia)
- Larger goal: develop a theory of conditional meaning that explains both what is similar, and what is different among varieties of conditional adjuncts.
- **Proposal (similarities):** a conditional adjunct is any adjunct that serves to restrict the contextual domain of operators in its scope (Rawlins 2008).
 - Generalization of the Lewis-Kratzer-Heim analysis of “if”-conditionals as domain restrictors. (Lewis 1975; Kratzer 1977, 1981, 1986; Heim 1982; Partee 1991; von Stechow 1994)
- **Proposal (differences):** variation in meaning of conditional adjuncts is caused by differences in internal structure of adjunct (conditional uniformity hypothesis).
- Means: case study of “if”-conditionals vs. unconditionals.

<i>“If”-conditional</i>	(4)	If you make a pizza or a calzone, you should put mushrooms in it.
<i>Alternative unconditional</i>	(5)	Whether you make a pizza or a calzone, you should put mushrooms in it.
<i>Alternative unconditional</i>	(6)	Whether you make a pizza or not, you should put mushrooms in the entree.
<i>Constituent unconditional</i>	(7)	Whatever entree you make, you should put mushrooms in it.

- How are unconditionals related to “if”-conditionals?
 - Prior researchers agree that they are, but no agreement as to how. (König 1986; Zaefferer 1990, 1991; Lin 1996; Haspelmath and König 1998; Izvorski 2000a,b; Gawron 2001; Huddleston and Pullum 2002)
 - Proposal: the two constructions involve temporary restriction of a contextual domain.
 - Semantic composition of adjunct with main clause proceeds by identical principles for each.
- What is the internal structure of an unconditional adjunct, and how does this affect its interpretation?
 - 3 previous ideas: interrogative structure (Zaefferer 1990), free relative structure (Izvorski 2000b), or something in between (Gawron 2001).
 - My claim: interrogative structure, matching that of an alternative or “wh-ever” interrogative.
 - Semantics & pragmatics of such structures leads compositionally to semantics of unconditional.

Agenda:

- More details about semantic and pragmatic properties.
- Sketch proposal for unification of “if”-conditionals and unconditionals.
- Fill in details: motivation for interrogative syntax, semantics of alternative and “-ever” questions, interaction of interrogative and conditional structures.

I SEMANTIC AND PRAGMATIC PROPERTIES

- Unconditionals entail their consequent uniformly.¹

(8) Whether Alfonso or Joanna brings the salad, it will have feta cheese in it.

Entails: The salad will have feta cheese in it.

(9) Compare: If Alfonso or Joanna brings the salad, it will have feta cheese in it.

- Unconditionals have a close paraphrase involving a sequence of “if”-conditionals (König 1986; Lin 1996):

(10) If Alfonso brings the salad, it will have feta cheese in it, and if Joanna brings the salad, it will have feta cheese in it.

I.1 Indifference and ignorance

- Unconditionals convey *relativized indifference*:

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

Conveys: it doesn't matter who comes

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

Conveys: it doesn't matter who comes

- Relativized – it may matter for many other purposes who comes to the party.

– But not for the issue of whether the party will be fun.

- In addition, unconditionals (especially with past antecedents) characteristically convey ignorance:

(13) Whether Alfonso or Joanna came to the party, it must have been fun.

Conveys: it doesn't matter (for funness) which one came, and the speaker doesn't know.

(14) Whoever came to the party, it must have been fun.

Conveys: it doesn't matter who came, and the speaker doesn't know.

I.2 Indifference in discourse

- Characteristic discourse use: avoid taking a stance on an issue, while moving the discourse forward.

(15) Scenario: Judges discussing who to award a prize to in a cooking competition.

¹This makes them similar to but still different from “concessive conditionals”, which in English are expressed with “even if”. These can, but do not have to, entail their consequent, depending on the scale structure involved. (They also involve something like the indifference implication.) Exx. from Guerzoni and Lim 2007:

(i) Even if the bridge were standing I wouldn't cross.

(ii) Even if John drank [F one ounce] of whiskey she would fire him.

This also makes them similar to headed unconditionals, which in Rawlins 2008 I analyze in a parallel way:

(iii) Regardless of/no matter who comes to the party, it'll be fun.

- A: Lisa had the best dessert.
 B: Whether or not it was the best dessert, Stephanie had the best over-all meal.
 B': Whoever made the best dessert, Stephanie had the best over-all meal.

1.3 Domain (un)restriction

- Lewis 1975: “if”-clauses have a restricting effect on quantificational domain of nearby operators (modals, adverbs of quantification).

(16) The party *should* be fun.

(17) If Alfonso comes to the party, it *should* be fun.

- Unconditionals and domain interaction:

(18) Whether Alfonso or Joanna comes to the party, it *should* be fun.

(19) Whoever comes to the party, it *should* be fun.

- Domain must include all (possible) alternatives. “Unrestriction”

- Restriction vs. unrestriction:

(20) a. # Whether Alfonso or Joanna comes to the party, if Alfonso comes, it *should* be fun.

b. # Whoever comes to the party, if Alfonso comes, it *should* be fun.

(21) Compare:

a. Whether Henry or Joanna comes to the party, if Alfonso comes, it *should* be fun.

b. Whoever else comes to the party, if Alfonso comes to the party, it *should* be fun.

Unconditionals keep a quantificational domain open.

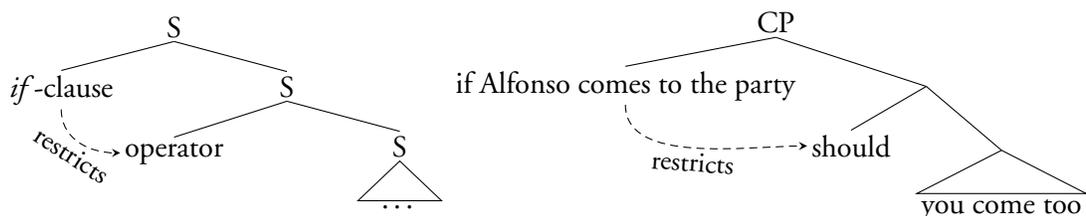
2 A SEMANTICS FOR UNCONDITIONALS

- Proposal: compositional interaction of the meaning of a conditional structure, and the meaning of an interrogative structure, lead to an understanding of unconditionals and their relation to “if”-conditionals.
- Lewis/Kratzer/Heim theory of conditionals (LKH): the semantic function of an “if”-clause is to restrict the domain of a quantificational operator (Lewis 1975/Kratzer 1977, 1981, 1986, etc./Heim 1982, Partee 1991).

(22) If it rains very hard, my roof *always* leaks.

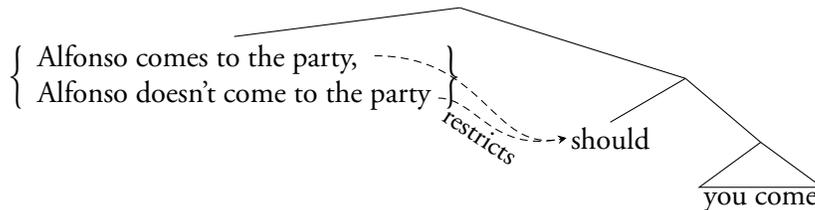
(23) If Alfonso comes to the party, you *should* come too.

(24)

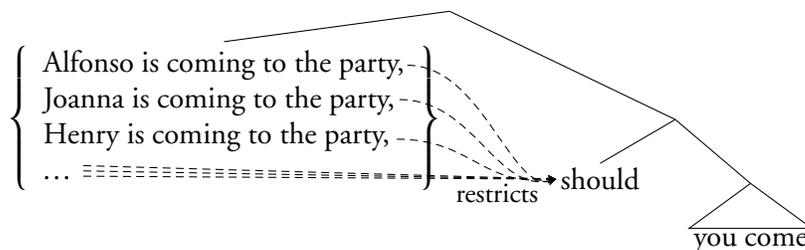


- **The effect of a semantics for interrogatives:** An unconditional adjunct provides not just one but a set of domain restrictions.
- Compositional Hamblin semantics (Hamblin 1973; Kratzer and Shimoyama 2002) provide a generalized mode of meaning combination – *pointwise* combination. (Pointwise function application.)

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

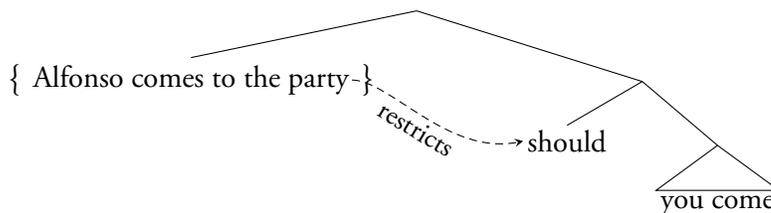


(26) Whoever (else) is coming to the party, you should come.



- Meaning of a regular “if”-clause is a singleton set.
 - When two singleton sets combine, pointwise combination reduces to regular semantic combination.
 - “if”-conditionals behave as we want – behavior reduces to standard LKH analysis.

(27) If Alfonso comes to the party, you should come.



- Analysis realizes the intuition about paraphrase with multiple “if”-conditionals.
- Because of question meaning, alternatives quantified over will be exhaustive.
- Exhaustivity presupposition in the context of a conditional structure: amounts to presupposing that we are looking at every possible way of restricting the domain.
 - (In the context of a regular question, simply constrains possible answers.)
- Because of meaning of modal, each conditional claim will be non-trivial.
- Consequences:
 - Exhaustive set of non-trivial conditional claims – it doesn't matter what domain restrictions we make, the main clause is true!
 - Derives both the contribution of indifference, and the fact that unconditionals entail their consequent.

Details to fill in:

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3 UNCONDITIONAL ADJUNCTS AS INTERROGATIVES

- Compositional analysis \models semantics follows from syntax.
 - What is the syntax of an unconditional adjunct?

3.1 Alternative unconditionals

- Alternative interrogative structure.
- Structural properties: disjunction, interrogative syntax/morphology.
- Intonational properties: pitch accents on non-final disjuncts, final falling pitch H*L-L% (Bartels 1999; Pruitt 2008).

(28) Would you like decaf or regular?

(29) Alfonso wondered whether he should take the exam now or in the fall.

(30) Whether you want decaf or regular, I need to brew a new pot.

(31) Whether he takes the exam now or in the fall, he will do well.

- Test: Characteristic properties of embedded alternative interrogatives. TP ellipsis following negation (“or not”; cf. Merchant 2003), and the unexpected leftward appearance of “or not”.

(32) Alfonso wondered whether the party was cancelled or was not cancelled.

(33) Alfonso wondered whether the party was cancelled *or not*.

(34) Alfonso wondered whether *or not* the party was cancelled.

- Alternative unconditionals show the same pattern:

(35) Whether the party is cancelled or is not cancelled, we should go out tonight.

(36) Whether the party is cancelled *or not*, we should go out tonight.

(37) Whether *or not* the party is cancelled, we should go out tonight.

- In general: no properties to distinguish alternative interrogatives from alternative unconditional adjuncts.²

²Contra Gawron 2001 who claimed the adjuncts were a kind of NP. The motivation, aside from uniformity, is that such clauses can appear in argument positions, including subject position. But it is well known that subject clauses differ from nominal subjects in many ways, e.g. default agreement.

3.2 Constituent unconditionals

- Previous assumptions/proposals:
 - Free relatives (Dayal 1997; Izvorski 2000a,b).
 - Interrogatives (Zaefferer 1990, 1991; Huddleston and Pullum 2002).
 - A type of nominal construction distinct from both plain free relatives and interrogatives (Gawron 2001).
- All three hypotheses are a priori plausible.
 - Free relatives – synonymity with “-ever” FR examples:
 - (38) Whoever comes to the party will have fun.
 - (39) Whoever comes to the party, they will have fun.
 - Free relatives – a crosslinguistic possibility (Dayal 1995; Quer and Vicente 2009; Gu 2009). E.g. correlative construction in Hindi:
 - (40) [TP [CP jo laRkii khaRii hai] [TP vo lambii hai]]
REL girl standing is DEM tall is
'The girl who is standing is tall.' (Ex. from Srivastav (1991))
 - Interrogatives – “-ever” can appear in questions:
 - (41) Whoever could have done that?
 - (42) Whatever is Alfonso be saying to that woman?
 - (43) Whatever happened to Joanna?

In favor of an interrogative analysis: appearance of a question-only idiom.

- “What was X doing Y” (Pullum 1973; Kay and Fillmore 1999)
- Huddleston and Pullum 2002 (§5.3.6 fn. 17): this is ok in interrogatives, but not FRs. Also allowed in unconditionals.
 - (44) What were they doing reading her mail?
 - (45) * She didn't complain about whatever they were doing reading her mail.
 - (46) Whatever they were doing reading her mail, it didn't lead to any legal problems.
- If “wh-ever” adjunct were a FR, this wouldn't be possible.

Against a free relative/nominal analysis: multiple “wh”.

- Possible in questions, unconditionals, not in free relatives (Baker 1968, 1970; as applied to unconditionals, Izvorski 2000b; Gawron 2001; Huddleston and Pullum 2002; Grosu 2003):
 - (47) Alfonso knows who said what.
 - (48) * Alfonso talked to who(ever) said what.
 - (49) Whoever buys whoever's property, the town council will still grant a building permit. (Gawron)
 - (50) ? Whoever said what to whom, we've got to put this incident behind us and work together as a team. (Huddleston and Pullum)

In favor of an interrogative analysis: echo question licensing.

- Jespersen 1909–1949; Baker 1968; Caponigro 2003: Can only question/echo interrogatives with “what”. (Echo-)questioning a FR uses interrogative pronoun based on head of FR.

- (51) A: Alfonso knows who Joanna talked to.
B: What does Alfonso know? / Alfonso knows WHAT?
B': * Who does Alfonso know? / Alfonso knows WHO?
- (52) 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?

- Difficult to apply directly to unconditionals; can't directly question or echo-question the adjunct.
- However, a very interesting echo pattern:

- (53) 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” takes a question complement.³
- Would not predict the B response to be licensed if “wh-ever” adjunct were a free relative.⁴

Summary of syntactic evidence

- Alternative unconditional adjuncts look like run-of-the-mill alternative interrogative CPs.
- Constituent unconditionals pattern with interrogative CPs as well. No evidence for new kind of “wh”-structure. (Root “wh-ever” questions.)
- English constituent unconditionals are clearly not free relatives, contra Dayal 1997; Izvorski 2000a,b.

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4 ON THE SEMANTICS OF INTERROGATIVES

- Groenendijk and Stokhof 1997 – **Hamblin's picture** (cf. Hamblin 1958, 1973; Groenendijk and Stokhof 1984)
 - (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.

³Actually, 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.

⁴To really see this prediction, one needs to examine why the test works the way it does. See Rawlins 2008 for such an examination, or ask.

- Hamblin 1973 (see also Karttunen 1977; Hagstrom 1998; Kratzer and Shimoyama 2002; Lahiri 2002 among many others):

– An interrogative denotes a set of propositions, corresponding to possible answers.

$$(54) \quad \llbracket \text{Did Alfonso come to the party} \rrbracket = \left\{ \begin{array}{l} \lambda w. \text{Alfonso came to the party in } w, \\ \lambda w. \text{Alfonso did not come to the party in } w \end{array} \right\}$$

$$(55) \quad \llbracket \text{Who came to the party?} \rrbracket = \left\{ \begin{array}{l} \lambda w. \text{Alfonso came to the party in } w, \\ \lambda w. \text{Joanna came to the party in } w, \\ \lambda w. \text{Henry came to the party in } w, \\ \vdots \\ \vdots \\ \vdots \end{array} \right\}$$

4.1 Alternative interrogatives

- First pass:

$$(56) \quad \llbracket [\text{Q Did}]_C \text{ Alfonso or Joanna bring an entree?} \rrbracket = \left\{ \begin{array}{l} \lambda w. \text{Alfonso brought an entree in } w, \\ \lambda w. \text{Joanna brought an entree in } w \end{array} \right\}$$

Mutual exclusivity and exhaustivity

- What about part (ii)?
- Propositional alternatives are:
 - exhaustive if they cover all the situations. (There are no situations where neither are true.)
 - mutually exclusive if they don't overlap on any situations. (There are no situations where both are true.)
- First-pass denotation guarantees neither property.
- Alternative unconditionals illustrate the need for both principles as linguistic presuppositions of the clause.⁵

Exhaustivity:⁶

- (57) Scenario: Alfonso, Joanna, or Henry might bring the salad to the potluck.
- # Whether Alfonso or Joanna brings the salad, it will have feta cheese in it.
 - Whether Alfonso, Joanna, or Henry brings the salad, it will have feta cheese in it.

- Example also illustrates the point the exhaustivity must be relativized to the context of utterance.

Mutual exclusivity:

- Without mutual exclusivity (or some other modification) alternatives in (59) will overlap. (Given exhaustivity.)

(58) Scenario: If we get two more entrees we will have enough food, but one won't do.

⁵Additional arguments can be adduced solely on the basis of root & embedded alternative questions; cf. Karttunen and Peters 1976; Rawlins 2008; Biezma 2009.

⁶If you want a question to ask, here's one: could the exhaustivity effect be due to the intonation of alternative questions in particular?

- a. Whether Alfonso or Joanna brings an entree, we will have enough food. (FALSE)
- b. Whether Alfonso or Joanna brings an entree, we won't have enough food. (TRUE)

- If alternatives overlapped, would go the opposite way.
- Second pass (following Karttunen and Peters 1976; Rawlins 2008; Biezma 2009):

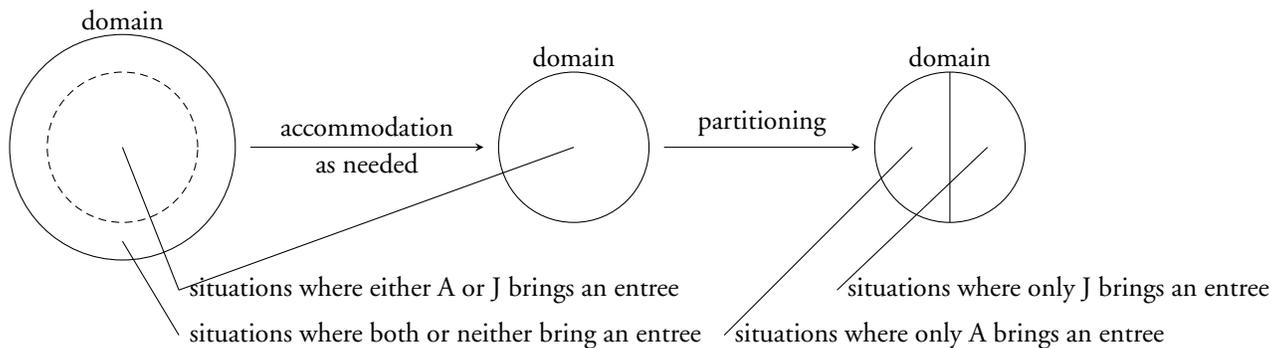
$$(59) \quad \llbracket [\text{Q Did}]_C \text{ Alfonso or Joanna bring an entree?} \rrbracket = \left\{ \begin{array}{l} \lambda w. \text{Alfonso brought an entree in } w, \\ \lambda w. \text{Joanna brought an entree in } w \end{array} \right\}$$

Presupposes:

- (i) Every situation (in the domain) is in some alternative in $\llbracket \alpha \rrbracket$ (exhaustivity)
- (ii) No situation (in the domain) is in more than one alternative in $\llbracket \alpha \rrbracket$ (mutual exclusivity)

- “Domain”: domain of discourse – situations under consideration by discourse participants.
 - Following Groenendijk 1999; Isaacs and Rawlins 2008, I take this to be the context set (Stalnaker 1978) – same domain partitioned by questioning.
 - Groenendijk’s proposal (cf. Hulstijn 1997): while asserting removes worlds, questioning partitions the context (set).
 - Accommodating mutual exclusivity or exhaustivity \Rightarrow removing appropriate worlds from domain prior to partitioning it.

(60) Interpretation of a root alternative question



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4.2 *Wh-ever* interrogatives

- How do “wh-ever” interrogatives differ from plain constituent interrogatives?

(61) 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?

- Ignorance.
- “wh-ever” interrogatives not compatible with implicit domain narrowing.
 - (62) 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.
 - a. Who will they pick?
 - b. Whoever will they pick?
- Each competitor is an unlikely pick.
- Ignorance persists when set of individuals under consideration is fixed.
 - Also, the effect cannot be derived from an extensional domain shifting/widening analysis (cf. den Dikken and Giannakidou’s 2002 treatment of “the hell” questions).
- Proposal: “-ever” indicates that the domain of discourse is as wide as possible, relative to the issue the question raises. (cf. widening in Kadmon and Landman 1993)
 - Set of individuals under consideration will have to be wide as a consequence (but won’t necessarily widen).
- Domain: same domain as before.
- What does it mean to be wide? Domain includes worlds where propositions in question are very unlikely but still possible. (See appendix)
 - (63) A domain $D \in \mathcal{P}(W)$ is WIDE relative to a modal base f and ordering source g , and set of alternatives A , iff

$$D \supseteq \{w \mid \exists p \in A : p \text{ is a slight possibility in } w \text{ relative to } f_c \text{ and } g_c\}$$
 - (64) $c + [\text{whatever/on earth } [\alpha]] = c + [\text{what } [\alpha]]$
 defined only if $\text{Dom}(c)$ is WIDE relative to $[[\text{what } [\alpha]]]^c$, f_c , and g_c .
 where f_c is a speaker-oriented epistemic modal base and g_c a circumstantial ordering source.
- Discourse circumstances radically underspecify contexts: the context is subject to vagueness.
- Lewis 1979: In normal circumstances we tend to ignore possibilities that we consider unlikely or not relevant by default.
 - E.g. implicit domain narrowing.
- However, the boundary can be explicitly shifted outwards via accommodation.⁷
 - Wideness presupposition enforces attention to the unlikely possibilities in just this way.
 - Ensures that worlds where an alternative is extremely unlikely are contained in the alternative.
- Widening explains ignorance – a consequence of speaker requiring even the unlikely possibilities to be included in domain.

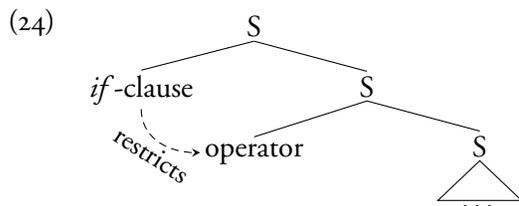
⁷“Suppose I am talking with some elected official about the ways he might deal with an embarrassment. So far, we have been ignoring those possibilities that would be political suicide for him. He says: ‘You see, I must either destroy the evidence or else claim that I did it to stop Communism. What else 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)

- Interrogative syntax
- Semantics for alternative questions
- Semantics for *-ever* questions
- Semantics for conditionals
- A question meaning in a conditional adjunct
- Composition of adjunct with main clause

5 INTERROGATIVES IN A CONDITIONAL STRUCTURE

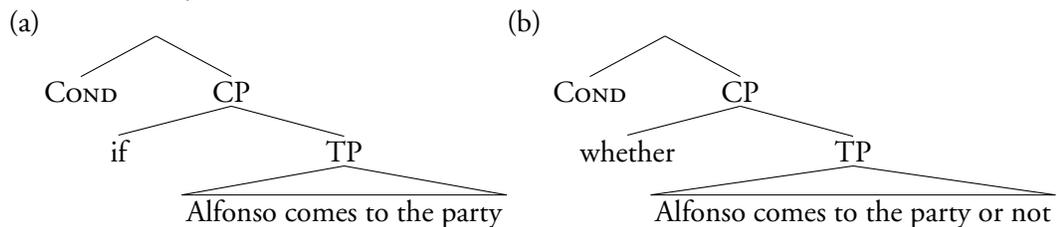
5.1 Implementing the Lewis/Kratzer/Heim theory

- Conditional adjunct provides a restriction to a modal.



- Implementation question: how to get content of adjunct to the modal? (See appendix for full details.)
- Basic idea: conditional adjunct shifts the context that the main clause is interpreted relative to, introducing new restriction into domain.
 - Benefit over competing proposals: no unusual syntax or LF movement required.
- Modals sensitive to this contextual parameter.
- Important assumption: modals presuppose that their domain is non-trivial – modal claim is not made based on an empty domain.
- Need to disassociate this effect from $\llbracket \text{if} \rrbracket$ per se. Feature/operator COND that appears on all conditional adjuncts. (Rawlins 2008: simultaneously regulates distribution of conditional adjuncts.)

(65) Structure of adjuncts



$$(66) \llbracket \text{COND} \rrbracket^c = \{ \lambda p_{\langle st \rangle} . \lambda p'_{\langle c \langle st \rangle \rangle} . \lambda w_s . p'(c + p)(w) \}$$

p : restrictor ("if"-clause etc)

p' : nuclear scope, context abstracted over

$c + p$: result of updating context (c) temporarily with p

- Key assumption: + updates conversational backgrounds in c . (Or, context set is conversational background.)
 - Domain of questioning = domain of domain restriction = domain of widening = domain of exhaustification.

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5.2 Pointwise combination and interrogative adjuncts

- Normal mode of semantic combination: function application (Frege). Denotations are functions, and combine with arguments.

$$FA(f, x) = f(x)$$

- Hamblin's pointwise function application: when a set of functions and a set of arguments combine, every argument is applied to every function. (Used for interpretation of questions, free choice items, disjunction, etc.)

- Special case A: singleton sets. One function and one argument – combine as in regular function application.

$$\text{PointwiseFA}(\{f\}, \{x\}) = \{f(x)\}$$

- Special case B: singleton function, set of arguments. Each argument applied to the function in turn; size of resulting set is the same as size of set of arguments.

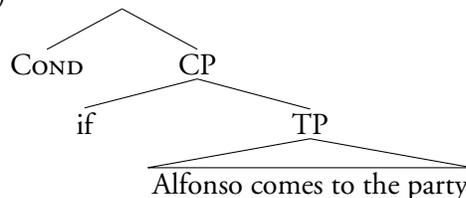
$$\text{PointwiseFA}\left(\{f\}, \left\{\begin{matrix} x_1, \\ x_2, \\ \dots \\ x_n \end{matrix}\right\}\right) = \left\{\begin{matrix} f(x_1), \\ f(x_2), \\ \dots \\ f(x_n) \end{matrix}\right\}$$

- Special case B': reverse of B, multiple functions and one argument. Similar result.

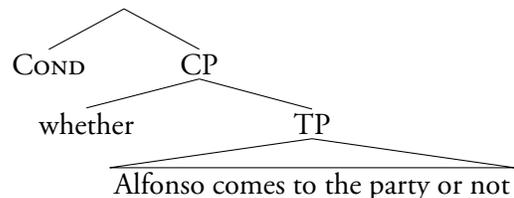
$$\text{PointwiseFA}\left(\left\{\begin{matrix} f_1, \\ f_2, \\ \dots \\ f_n \end{matrix}\right\}, \{x\}\right) = \left\{\begin{matrix} f_1(x), \\ f_2(x), \\ \dots \\ f_n(x) \end{matrix}\right\}$$

(67) Structure of adjuncts

(a)



(b)



- “if”-clause instantiates special case A.
 - f = COND's meaning: a function that builds a domain restrictor for the sentence it is adjoined to.
 - x = CP's meaning: a singleton set containing a proposition (that Alfonso comes to the party).
 - Combination ($f(x)$) is a singleton set containing a domain restrictor – it restricts the domain to situations where Alfonso comes to the party.

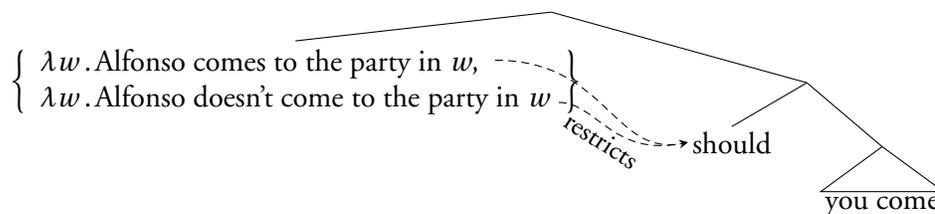
- unconditional adjunct in (b) instantiates special case B (internally).
 - $f = \text{COND}$'s meaning, as above.
 - CP's meaning: a set of propositions; two in this case. ($x_1 =$ the proposition that Alfonso comes to the party; $x_2 =$ the proposition that he doesn't.)
 - Combination produces a set of domain restrictors of the same size.

<input checked="" type="checkbox"/>	Interrogative syntax
<input checked="" type="checkbox"/>	Semantics for alternative questions
<input checked="" type="checkbox"/>	Semantics for <i>-ever</i> questions
<input checked="" type="checkbox"/>	Semantics for conditionals
<input checked="" type="checkbox"/>	A question meaning in a conditional adjunct
<input type="checkbox"/>	Composition of adjunct with main clause

5.3 Composition with main clause

- Combination of unconditional adjunct with main clause:.
 - Main clause – singleton set containing a proposition; proposition is sensitive to contextual domain restriction because of modal.
 - Set of domain restrictors combines pointwise with main clause (case B').
 - Result: set of conditionalized propositions.

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



$$= \left\{ \begin{array}{l} \text{For all closest worlds } \in \text{DESIRE}_{s_c} \text{ where Alfonso comes to the party, you come to the party.} \\ \text{For all closest worlds } \in \text{DESIRE}_{s_c} \text{ where Alfonso doesn't come to the party, you come to the party.} \end{array} \right\}$$

(where DESIRE_{s_c} is the set of the most salient situations that are compatible with the speaker's desires (bouletic background imposed by "should").)

- Missing some details – what about the extra twists in question meanings? (exhaustivity, mutual exclusivity, wideness)
 - Project as presuppositions of entire sentence.
 - Alternatives most exhaust the possibilities – it is presupposed that at least one of them is true, relative to domain of discourse.
 - Alternatives must be mutually exclusive – it is presupposed that no more than one of them is true, relative to domain of discourse.
- Denotation for a constituent unconditional works the same way.
 - Wideness presupposition applies to domain of interpretation for entire sentence.
- Final step: denotation is a non-singleton set, but sentence is declarative. Need a singleton set denotation.

- Hamblin \forall operator: all alternatives are true (cf. generalized conjunction.).⁸
- Non-triviality presupposition of modal: projects as a *distribution presupposition* – each alternative is non-trivial.

✓	Interrogative syntax
✓	Semantics for alternative questions
✓	Semantics for <i>-ever</i> questions
✓	Semantics for conditionals
✓	A question meaning in a conditional adjunct
✓	Composition of adjunct with main clause

6 SUMMARY

Explanation of unconditional behavior

- Analysis directly realizes the intuition about paraphrase with multiple “if”-conditionals...with some twists.
- Consequences of the compositional interaction of pieces of an unconditional:
 - Exhaustivity presupposition – unconditionals interpreted against a domain where they exhaust all the possibilities.
 - Mutual exclusivity – unconditionals interpreted against a domain where no alternatives overlap.
 - Distribution presupposition – alternatives are distributed throughout the domain.

- Exhaustive conditional claims \Rightarrow consequent entailment.
- Exhaustive non-trivial conditional claims \Rightarrow indifference.
- Characteristic discourse effect:

(69) A: Alfonso is very intelligent.
 B: Whether or not he’s intelligent, he shouldn’t get an A in this class.

- B’s lack of commitment to Alfonso being very intelligent follows from analysis, as does the fact that the discourse moves forward.
 - Dialogues of this kind appear in larger discourses where the question under discussion (Roberts 1996; Büring 2003) is e.g. what grade he should get – question addressed independently of unconditional antecedent.
 - Presupposes that each alternative is non-trivial – there are situations/worlds both where he is intelligent, and he isn’t.
 - Indifference claim is that this simply doesn’t matter.
 - Main clause – that he shouldn’t get an A – is true either way.

Broader results

- Bring together a range of analyses of different phenomena (modals, conditionals, questions, free choice) and show how they can work together.
- Unconditionals and “if”-conditionals work the same way – differences follow from internals.

⁸I take \forall to be a default operator, inserted up to interpretability, following Menéndez-Benito 2006.

- Because adjunct “if”-clauses don’t have a question meaning, non-exhaustive (single-alternative) domain restriction.
 - Because adjunct interrogatives have a question meaning, exhaustive, multiple-alternative, domain restriction.
 - A *unified* account of unconditionals and “if”-conditionals. (Extension to other conditional-like structures.)
- **Conditional uniformity hypothesis:** differences among conditional adjuncts follow entirely from their contents.
 - Challenge: non-interrogative unconditionals.
 - (70) Llueva o brille el sol, saldremos.
rain:SUBJ or shine:SUBJ the sun, go.out:FUT:1PL
‘Whether it rains or the sun shines, we’ll go out’ (Spanish; from Haspelmath and König 1998)
 - (71) Nereye gider-se-m gid-eyim, bin-i birak-ma-yacag-in
where go-COND-1SG go-OPT.1SG I-ACC leave-NEG-FUT-2SG
‘Wherever I go, you will never leave me.’
 - (72) Co bys nie zrobil Jan nie dostanie pracy
what be-SUBJ not done Jan not get job
‘Whatever you do, Jan will not get the job.’ (Polish, ex. from Izvorski 2000b)
 - A more general hypothesis: **Clausal adjunct uniformity**
 - Small, fixed, universal inventory of features like COND. EXX: CAUSE, EXPLAIN, CONTRAST – all instantiated at discourse level as well.
 - Differences among *all* clausal adjuncts follow from compositional interaction of contents with this fixed inventory of features.

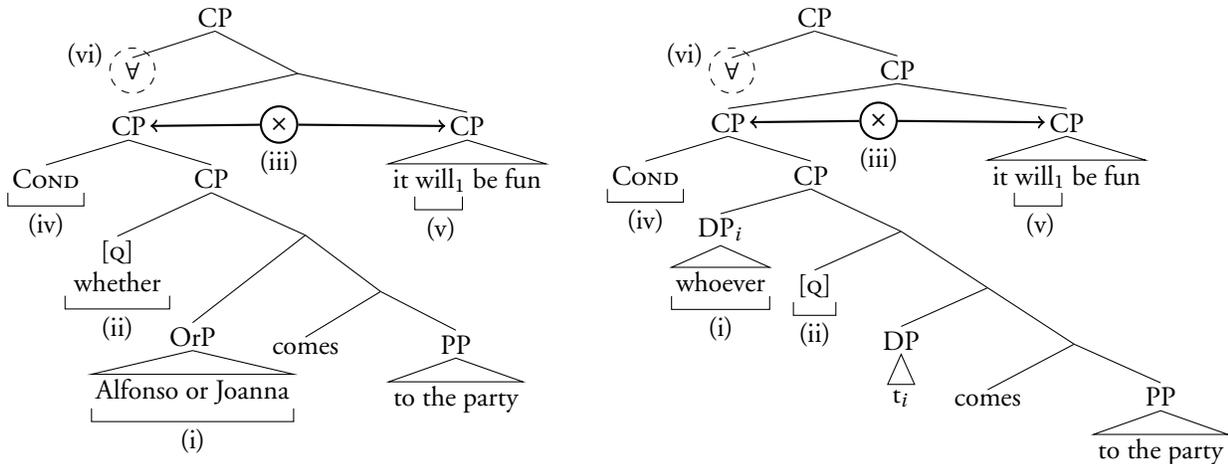
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7 TECHNICAL APPENDIX

- If you *really* want all the details, see Rawlins 2008 (available on my website).

(73) Anatomy of an unconditional



-
- (i) Disjunction or a *wh-ever* item introduces alternatives into the composition.
 - (ii) The question operator introduces exhaustiveness & mutual exclusivity presuppositions.
 - (iii) Alternatives compose pointwise with the main clause via Hamblin pointwise function application – one modal claim for each alternative.
 - (iv) A conditional adjunct (whatever its content) restricts the domain of a main clause modal.
 - (v) The modal imposes an existence presupposition on its domain – leading to a distribution presupposition.
 - (vi) A default Hamblin universal operator collects alternatives.
-

7.1 Alternative questions

- Decomposition of question operator and clause.
- New denotation for alternative interrogatives in two parts (following Karttunen and Peters 1976).
 - Part 1: disjunction introduces alternatives (von Stechow 1991; Alonso-Ovalle 2005; Simons 2005).
 - Part 2: question operator lets alternatives through (Kratzer and Shimoyama 2002), introduces presuppositions.

(74) $\llbracket [Q \alpha] \rrbracket = \llbracket [\alpha] \rrbracket$

- defined only if
- (i) Every situation (in the domain) is in some alternative in $\llbracket [\alpha] \rrbracket$
 - (ii) No situation (in the domain) is in more than one alternative in $\llbracket [\alpha] \rrbracket$

7.2 “Wh-ever” questions

- What does it mean to be wide? Domain includes worlds where propositions in question are very unlikely but still possible.
 - “Likely” as human necessity (Kratzer 1981): proposition true in closest worlds in the modal base.
 - Unlikely worlds as well – WIDENESS reduces to simple compatibility with modal base. (This simplifies – it is too strong.)

(75) **Wideness**

A domain $D \in \mathcal{P}(W)$ is WIDE relative to a modal base f and ordering source g , and set of alternatives A , iff

$$\text{Dom}(c) \supseteq \{w \mid \exists p \in A : p \text{ is a slight possibility in } w \text{ relative to } f_c \text{ and } g_c\}$$

(76) **Denotation for “-ever”**

Where α denotes a function from alternative sets of individuals to alternative sets of propositions:

$$\llbracket \text{who-ever } [\alpha] \rrbracket^{g,c} = \left\{ p_{\langle st \rangle} \mid \begin{array}{l} p \in \llbracket \alpha \rrbracket^{g,c} (\{x \mid x \text{ is human}\}) \\ \wedge \exists w \in cs_c : p(w) \end{array} \right\}$$

defined only if cs_c is WIDE relative to f_c, g_c , and $\llbracket \alpha \rrbracket^c (\{x \mid x \text{ is human}\})$.

where f_c is a speaker-oriented epistemic modal base and g_c a circumstantial ordering source.

7.3 Compositional treatment of conditionals

- Movement approach: reconfigure LF so that adjunct is always adjacent to modal. (Heim 1982; Diesing 1992)
 - Major technical problems: multiple conditional structures. Also, exx where movement just not plausible:

(77) If you want to learn about birds, Alfonso is the person you *should* talk to.

- Binding approach (von Stechow 1994; Schlenker 2004; Bhatt and Pancheva 2006): conditional adjunct binds a variable on or near the modal.
 - Justified by correlative-like nature of “if”-clauses (Bhatt and Pancheva). “If”-clauses as free relatives over possible worlds (Schlenker).
 - Unconditionals offer no evidence that they are correlatives. No proform (incompatible with “then”), don’t act like FRs.
- Shifting approach: modal’s domain arrives via context of interpretation, and conditional adjunct shifts that context (Karttunen 1974; Kratzer 1981; Heim 1982, etc.)
 - Conditional adjuncts as a particular species of sentence operator.
 - No unusual syntax required.
 - Need a conditional operator to do the work, introduced lexically by “if” (cf. Gillies 2007).
- For some context c , $c + \phi$ introduces ϕ as a temporary assumption in the context set of c .

(78) $\llbracket [\text{COND } [\text{if } \alpha]], \beta \rrbracket^{g,c} = \llbracket \beta \rrbracket^{g,(c+[\alpha]^{g,c})}$

- Modal makes use of context set⁹: (e.g. “with respect to $cs_c \cap f_c(w)$ ”)

(79) The party should be fun.

(80) $\llbracket \text{should} \rrbracket^{g,c} =$
def

$\left\{ \lambda p_{\langle st \rangle} . \lambda w \text{ s.t. } cs_c \cap f_c(w) \neq \emptyset . p \text{ is a human necessity in } w \text{ with respect to } (cs_c \cap f_c(w)), \text{ and } g_c \right\}$
defined only if f_c is an epistemic conversational background and g_c is a circumstantial conversational background.

⁹This assumption is not standard. See Isaacs and Rawlins 2008 for motivation.

- Underlined part: non-triviality presupposition – modal claim is not made based on an empty domain.
- More compositionally:¹⁰

$$(81) \quad \llbracket \text{COND} \rrbracket^{g,c} = \{ \lambda p_{\langle st \rangle} . \lambda p'_{\langle c(st) \rangle} . \lambda w_s . p'(c + p)(w) \}$$

- Denotation of an “if”-clause adjunct: singleton set containing a context shifter.

7.4 Composition with main clause

$$(82) \quad \llbracket \text{Whether Alfonso comes to the party or not, it should be fun} \rrbracket^{g,c} = \left\{ \begin{array}{l} \lambda w \text{ s.t. } \underline{cs'_c \cap \cap f_c(w)} \neq \emptyset . \text{ that the party is fun is a human necessity in } w \text{ with respect to } (cs'_c \cap \cap f_c(w)), \text{ and } g_c, \\ \lambda w \text{ s.t. } \underline{cs''_c \cap \cap f_c(w)} \neq \emptyset . \text{ that the party is fun is a human necessity in } w \text{ with respect to } (cs''_c \cap \cap f_c(w)), \text{ and } g_c \end{array} \right\}$$

Where $cs'_c = cs_c + (\lambda w . \text{Alfonso comes to the party in } w)$

$cs''_c = cs_c + (\lambda w . \text{Alfonso doesn't come to the party in } w)$

defined only if f_c is a circumstantial conversational background and g_c is a deontic conversational background.

$$(83) \quad \text{e.g. } \left\{ \begin{array}{l} \text{If Alfonso comes to the party, it should be fun,} \\ \text{If Alfonso doesn't come to the party, it should be fun} \end{array} \right\}$$

- Leaving out some details – what about the extra twists in question meaning?

(84) The denotation in (82) is defined only if

(i) Every world (in cs_c) is in some alternative in

$$\left\{ \begin{array}{l} \lambda w . \text{Alfonso comes to the party in } w, \\ \lambda w . \text{Alfonso doesn't come to the party in } w \end{array} \right\}$$

(ii) No world (in cs_c) is in more than one alternative in

$$\left\{ \begin{array}{l} \lambda w . \text{Alfonso comes to the party in } w, \\ \lambda w . \text{Alfonso doesn't come to the party in } w \end{array} \right\}$$

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¹⁰Assuming that c is the domain of contexts, and there is a type-shift that will abstract over contexts.

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