Unconditionals are conditionals*

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1 Introduction

1.1 Some unconditionals

There is a variation in what people call unconditionals, and even more in the labels given to various sub-classes thereof. The ones I use here are taken from Rawlins (to appear, 2008).

(1) a. Whether Mary comes or not, we will open another bottle. *(Alternative unconditional)*
b. Whether John or Mary comes, we will open another bottle. *(Alternative unconditional)*
c. Whoever comes, we will open another bottle. *(Constituent unconditional)*
d. No matter who comes, we will open another bottle. *(Headed unconditional)*
e. Regardless of who comes, we will open another bottle. *(Headed unconditional)*
f. Rain or shine, we will have our party. *(Bare unconditional)*

1.2 Rough analysis

- An adjunct modifies a (modal) operator in the main clause
  (similar to conditional antecedents)
- The adjunct usually contains a *wh*-word and looks a lot like a question.
- Semantics: The matrix clause is true *regardless* of what the answer to the question is.

1.3 Topic of this talk

- While most previous researchers recognized the semantic commonalities with conditionals, they postulated compositional analyses quite distinct from those for conditionals (Zaefferer, 1990, 1991; Lin, 1996; Izvorski, 2000; Gawron, 2001).
- Rawlins (to appear, 2008) proposed a "unified" (though perhaps not quite uniform) analysis of unconditionals and conditionals.
- Main claims:
  - Rawlins's account is both too simple and too complex;
  - Unconditionals and conditionals have *exactly* the same meaning (à la *inquistive semantics*);
  - How to implement a Kratzer-style semantics for unconditionals in inquistive semantics

*This work in progress, in part jointly with Floris Roelofsen. All errors are my own.

2 Some properties of unconditionals[1]

2.1 Similarities and interactions with conditional *'if'*-clauses

i. They can be stacked and interleaved:

(2) a. If John sings, then whether he is drunk or not, it will be hilarious.
b. Whether John is drunk or not, if he sings, it will be hilarious.

ii. They can make each other redundant:

(3) a. #If John sings, then whether he sings or not, it will be hilarious.
b. #Whether John sings or not, if he sings, it will be hilarious.

iii. Counterfactual (un)conditionals (cf. Gawron, 2001, and others):

(4) a. Whether he had come or not, we would have canceled the meeting.
b. Whatever John had chosen, Mary would have been pleased with it.

2.2 Similarities with questions

i. Negative stripping and leftward drift of *'or not'*

(5) a. I wonder whether John comes or doesn't come.
b. I wonder whether John comes or not.
c. I wonder whether or not John comes.

(6) a. Whether John comes or doesn't come, we'll have our party.
b. Whether John comes or not, we'll have our party.
c. Whether or not John comes, we'll have our party.

ii. See Rawlins (to appear, 2008) for arguments that constituent unconditionals are not free relatives.

2.3 Some semantic intuitions

i. Unconditionals "feel like" (exhaustive) conjunctions of conditionals

(7) a. Whether it rains or not, we'll hold our match.
b. If it rains, we'll hold our match, and if it doesn't rain, we'll hold our match.

(8) a. Whatever you do, she's going to leave you.
b. If you apologize, she's going to leave you, if you buy her flowers, she's going to leave you, if you take her on a vacation, she's going to leave you, . . . , and if you do none of the above, she's going to leave you.

ii. Unconditionals interact with modal operators in a similar way to conditionals, but (in a certain sense) in the opposite direction:

(9) a. I will take the test.
b. If the test is in the morning, I will take it.
c. Whether the test is in the morning or not, I will take it.

Zaefferer (1990): Unconditionals "remove background assumptions" (conditionals add them).

iii. Unconditionals entail their consequents:

(10) a. Whoever shows up, we'll have a party.
b. ⇒ We'll have a party.

[1] A non-exhaustive list of findings that have been discussed in the literature.

3 Rawlins (to appear, 2008)[2]

I. Disjunctions and interrogatives introduce alternatives.

Composition by pointwise function application.

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

(12) $[\![\text{Alfonso or Joanna comes}]\!]^{g,w,c} = \{\{w' | \text{Alfonso comes in } w'\}, \{w' | \text{Joanna comes in } w'\}\}$

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

(14) $[\![\text{whatever}]\!]^{g,w,c} = \{x | x \text{ is not human}\}$

(15) $[\![\text{whoever comes}]\!]^{g,w,c} = \{\{w' | x \text{ comes in } w'\} | x \text{ is human}\}$

➥ The denotation at the clause level is a set of propositions.

II. Presuppositions introduced by interrogative morphology:

a. Exhaustivity.

(16) a. If Alfonso or Joanna comes, it will be fun.
$\not\rightsquigarrow$ One of them will come.

b. Whether Alfonso or Joanna comes, it will be fun.
$\rightsquigarrow$ One of them will come.

Cf. the presupposition of questions that at least one of their answers is true.

➥ The alternatives cover the modal base.

b. Exclusivity. See next section.

III. The alternatives are used as antecedents to build a set of conditionals.

Syntactically, this is done by a silent "conditional adjunct" in Spec CP which restricts the modal base of a (silent) modal. The details need not concern us here. Importantly:

- An *if*-clause denotes a singleton set containing one proposition.
  ⇒ Same result as ordinary function application.
- A *wh*-clause denotes a non-singleton set containing multiple propositions.
  ⇒ Pointwise function application to each element of the set.

➥ The result is a set of "conditionalized propositions."

IV. A "Hamblin universal quantifier" collects the alternatives.

The unconditional is true at just those worlds at which all the alternatives are true.

Rawlins has some trouble motivating the universal quantifier. Some suggestions he makes:

- Default Hamblin ∀ operators inserted up to interpretability (Ménendez-Benito, 2006)
- Default ∀ operator "inserted at spell-out" if there is no other operator
- Licensed by *'-ever'* / disjunction
  [not so clear…]

➥ In effect, the unconditional is interpreted as a conjunction of conditionals
(each with a "copy" of the modal operator and its own restriction on the modal base).

[2] Inspired by and similar to Gawron (2001). Main goal and contribution: to treat unconditionals and conditionals more uniformly than other extant theories did. I skip over many details.

4 “Exclusivity”

Caution: Rawlins’s use of the terms “exhaustivity” and “exclusivity” is potentially confusing because “exclusivity” means that the alternatives are *exhaustive answers*.

Point:
i. Rawlins (2008) assumes that the alternatives making up the antecedent of an unconditional are mutually exclusive.
ii. The facts are somewhat murky, and Rawlins’s argument is somewhat weak and inconclusive.
iii. I add some arguments that are somewhat stronger (though still inconclusive).
iv. Later on we’ll see that the whole question of “exclusivity” (or lack thereof) takes on some significance in the development of a formal account.

Rawlins’s argument

Situation: Two more dishes would be sufficient for the potluck; one more won’t do. Then (Rawlins claims) (17) should be true.

(17) Whether Alfonso brings a salad or an entree, we won’t have enough food.

Rawlins (2008, p. 128; numbers added):

i. [I]f there were a “both” alternative involved in the semantics of the adjunct, we’d expect the sentence to be false in this scenario.
ii. 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.
iii. Consequently, we must have exclusive alternatives in the semantics, and there must not be an alternative containing those worlds where both alternatives are true.

Note that Rawlins is making two separate claims.

Re (i): The absence of a “both” alternative may be due to either or both of:

a. World knowledge (i.e., there is no “both” world in the common ground)
This is pretty hard to rule out.
b. The semantics of alternative questions; cf. (18):

(18) A: Did Alfonso bring salad or an entree?
B: ?Both. (⇐ Felicity depends on question intonation.)

But it also occurs with other unconditionals (see below).

➠ In either case, it is not part of the semantics of unconditionals.

Re (ii): Contrary to Rawlins’s claim, allowing overlap would *not* necessarily render the sentence falsed: An *ordering source* (which he uses) may yet make it true (see below).

➠ This argument does not establish that overlapping alternatives are bad.

➠ Neither of the two claims are firmly supported. I am going to:

a. dismiss (i): specific to the example, or specific to alternative unconditionals;
b. give some more evidence for (ii).

Exclusivity in constituent unconditionals

Suppose unconditionals are (or behave like) conjoined conditionals. Two very general things to address:

I. Non-redundancy of unconditional antecedents

Unconditionals are stronger than their consequents (see Sec. 2): All the sentences in (1a-f) entail (19).

(19) a. Whether Mary comes or not, we will open another bottle.
b. Whether John or Mary comes, we will open another bottle.
c. Whoever comes, we will open another bottle.
d. . . .
⇒ We will open another bottle.

II. Failure of certain inference patterns

Famously, conditionals fail to validate certain inference patterns, such as Strengthening of the Antecedent. Thus (20a,b) are consistent.

(20) a. If you eat eggs for breakfast, you'll be healthy.
b. But if you eat only eggs for breakfast, you'll get sick.

Problem: Under the above analysis, neither of these facts is predicted if the force of the modal (e.g., *'will'* in (20)) is (strict or relative) necessity.

Solution: Rank worlds using an *ordering source* (see below for formal details).

- So suppose an ordering source *is* added, encoding *relative likelihood*.
- Suppose further that:

(21) a. You are more likely to eat more than one thing than to eat only one thing.
b. You don't get sick at any of the worlds at which you eat more than one thing;
c. You do get sick at some worlds in which you eat only one thing.

➠ Then the conditionals in (20a,b) are predicted to be mutually consistent.

However: Unconditionals do not pattern in the same way.

(22) a. Whatever you eat for breakfast, you'll be healthy.
b. ??But if you eat only one thing, you'll get sick.

Some more examples:

(23) a. If John comes to the party, it will be fun.
b. But if John comes alone, it won't be fun.

(24) a. Whoever comes to the party, it will be fun.
b. ??But if only one person comes, it won't be fun.

(25) a. If you buy her flowers, she'll be happy.

b. But if you buy her nothing but flowers, she'll be upset.

(26) a. Whatever you buy her, she'll be happy.
b. ??But if you buy her only one thing, she'll be upset.

Explanation: The conditionals in (22b), (24b), (26b) are infelicitous because they contradict the respective unconditionals in (22a), (24a), (26a)

But this is not predicted if worlds are ranked by an ordering source.

Q: Why?

A: Under the assumptions in (21) above, each of these conditionals is true:

(22a') If you eat $\left\{ \begin{array}{l} \text{eggs} \\ \text{toast} \\ \text{rice} \end{array} \right\}$ for breakfast, you'll be healthy.

(22b') But if you eat only one thing, you'll get sick.

Solution: The set of alternatives for the unconditional antecedent is not (27a), but (27b):

(27) a. {eggs, toast, rice}
b. {only eggs, only toast, only rice, only eggs and toast, only eggs and rice, you eat only toast and rice, eggs, toast and rice}

Q: Why should this be?

A: I don't know, but I suspect that expressions like *-ever / no matter / regardless* are (at least partly) responsible. (Domain Widening.)

- Rawlins's goal in imposing exclusivity was to *rule out overlap* between the alternatives
- In contrast, my goal is to *make non-overlap relevant*.

Q: Why should we care whether the alternatives are exhaustive answers?
A: a. Next section: some ideas from *inquisitive semantics*
b. Overall goal: Give a *single-operator* analysis of unconditionals.
I.e., not as a conjunction of conditionals; rather, as a single modal operator modified by an inquisitive adjunct.
c. Interestingly: How we can formalize this idea depends on whether the alternatives are exhaustive or not.

5 Inquisitive semantics

A logical framework whose many goals include:

- a uniform semantic interpretation of interrogative and declarative sentences, including Boolean compounds and mixtures thereof (Groenendijk and Roelofsen, 2009; Groenendijk, 2009; Ciardelli and Roelofsen, 2009; Ciardelli et al., to appear);
- a pragmatic account of discourse moves (like "raising an issue") which go beyond the now-standard account of assertion and belief update.

Syntax (only the propositional part): Standard language of propositional logic, plus an operator '?' defined as follows: $?\varphi =_{df} \varphi \vee \neg\varphi$.

- Whether a sentence is inquisitive or informative (or hybrid) is not determined by its syntactic form, but by its semantic interpretation.
- The '?' operator in itself is just a shorthand notation for polar questions and not very interesting. The action happens in the interpretation of disjunction.

Index: assignment of truth values to the atomic sentences in the language (may be thought of as a possible world).
State: non-empty set of indices.
Support: a relation between states σ and sentences φ, defined as follows (quantification over states ranges only over *non-empty* ones):

$$\begin{aligned}
\sigma \models p &\iff \forall v \in \sigma : v(p) = 1 \\
\sigma \models \neg\varphi &\iff \forall \tau \subseteq \sigma : \tau \not\models \varphi \\
\sigma \models \varphi \vee \psi &\iff \sigma \models \varphi \text{ or } \sigma \models \psi \\
\sigma \models \varphi \wedge \psi &\iff \sigma \models \varphi \text{ and } \sigma \models \psi \\
\sigma \models \varphi \to \psi &\iff \forall \tau \subseteq \sigma : \text{ if } \tau \models \varphi \text{ then } \tau \models \psi
\end{aligned}$$

Possibility for φ: Maximal state supporting φ.
Proposition expressed by φ: Set of possibilities for φ.
Inquisitiveness: φ is *inquisitive* iff the proposition it expresses contains at least two possibilities.

All of these notions can be (straightforwardly and as expected) *relativized* to a given state, yielding notions of relative possibility, inquisitiveness, etc.

Unconditionals

Fact: The proposition expressed by $?\varphi \to \psi$ is the same as the one expressed by ψ.
Question: Can we get a single-operator analysis of (un)conditionals out of this?
Idea: If φ is inquisitive, then $\varphi \to \psi$ is interpreted like an unconditional.
Otherwise it is interpreted like a conditional.
➠ How are we to deal with conditionals and modality, anyway?

Basic idea: a. Relativize the relevant notions to a modal base.
b. Introduce ordering sources etc. to get a realistic account of conditionals

6 Premise semantics for (un)conditionals

Originally designed to account for counterfactuals (Veltman, 1976; Kratzer, 1981b).

(28) If that match had been scratched, it would have lighted.

> When we say [(28)], we mean that conditions are such—i.e. the match is well made, is dry enough, oxygen enough is present, etc.—that "The match lights" can be inferred from "The match is scratched." ...[T]he connection we affirm may be regarded as joining the consequent with the conjunction of the antecedent and *other statements that truly describe relevant conditions*. *(Goodman, 1947, emph. added)*

- Let the relevant propositions be given (e.g., those that are likely/stereotypical/normal/salient).
- There are many ways to collect of them into sets. Each such set is a *premise set*.

➠ The interpretation of conditionals (and other modal expressions) depends on the premise sets.

Proposition: A set of possible worlds.

Premise set: A set of propositions. Used to test for necessity/possibility (in terms of consistency/consequence).

Entailment: A set X of propositions entails a proposition x iff $\bigcap X \subseteq x$.

"Human necessity" relative to a collection Φ of premise sets:

(29) $\boxdot(\Phi)(q) = 1$ iff for all $X \in \Phi$ there is $Y \in \Phi$ s.t. $X \subseteq Y$ and every $Z \in \Phi$ s.t. $Y \subseteq Z$ entails q.

➠ If you consider larger and larger premise sets, you reach a point at which they entail q.
➠ A weaker notion of necessity than "strict" necessity (i.e., truth at all possible worlds).

Modals: Interpreted relative to a world w, modal base f, ordering source o.
f, o are functions from worlds to sets of propositions.
For instance: $f(w) = \{p|$speaker knows p at $w\}$; $o(w) = \{p|$speaker considers p likely at $w\}$.[3]

(30) $[\![must\ q]\!]^{w,f,o} \iff \boxdot(\{\underline{f(w)} \cup X \big| X \subseteq o(w)\})(q)$

In words: Φ = all possible ways of adding propositions from $o(w)$ to $f(w)$.
➠ Every premise set contains the modal base and some propositions from the ordering source.
➠ The interpretation is *restricted* to worlds at which all propositions in the modal base are true.

Conditionals: Contain a (covert or overt) epistemic modal (human necessity by default).
Interpreted by adding the antecedent to the modal base.

(31) $[\![p > q]\!]^{w,f,o} \iff \boxdot(\{\underline{f(w) \cup \{p\}} \cup X \big| X \subseteq o(w)\})(q)$

➠ As before, but now every premise set also contains the antecedent.
➠ The interpretation is *further restricted* to worlds at which the antecedent is true.

Generalizing: Suppose the antecedent denotes a *set* of propositions (singleton for conditionals, non-singleton for unconditionals). Either way, interpret the conditional as follows:

(32) $[\![p > q]\!]^{w,f,o} \iff \boxdot(\{\underline{f(w) \cup \{x\}} \cup X \big| x \in p, X \subseteq o(w)\})(q)$

➠ Every premise set contains the modal base and one of the alternatives.

➠ Single-operator interpretation of conditionals and unconditionals.

[3] Notation: I assume for simplicity that all constituents of the sentences under discussion are non-modal and don't depend on w, f, g; and I abbreviate '$[\![p]\!]^{w,f,g}$' as 'p'. Conditionals are written as '$p > q$'; unconditionals as '$?p > q$'.

7 Ordering semantics for exhaustive (un)conditionals

Also originally designed to account for counterfactuals (Lewis, 1973; Stalnaker, 1968).

Closely related to premise semantics (Kratzer, 1981a,b, 1991a,b; Lewis, 1981).

- Instead of collecting sets of propositions, we *rank worlds*.
- The propositions entering the premise sets in Premise Semantics are used to induce the ranking in Ordering Semantics.

➽ The interpretation of modals and conditionals depends on the ranking.

Pre-order: Induced by ordering source o at world w. For all worlds u, v:

(33) $u \leq_{o(w)} v \iff \{p | p \in o(w) \wedge v \in p\} \subseteq \{p | p \in o(w) \wedge u \in p\}$

➽ u is "at least as good as" v in the relevant sense (at least as salient, no more salient) iff all the relevant propositions that are true at v are also true at u.

Equivalently: Given o, w, let $\Phi = \wp(o(w))$, the powerset of $o(w)$. Then

(34) $u \leq_\Phi v \iff \forall X \in \Phi[v \in \bigcap X \rightarrow u \in \bigcap X]$

➽ u is "at least as good as" v in the relevant sense (at least as salient, no more salient) iff all the premise sets compatible with v are also compatible with u.

"Human necessity" relative to a pre-order $\leq$:

(35) $\boxplus(\leq)(q) = 1$ iff for all u, there is a v s.t. $v \leq u$ and for all z s.t. $z \leq v$, $z \in q$.

Q: If we define the order using our premise sets from above, does this give us the right result?
A: Modals and conditionals: yes. Unconditionals: *only if the alternatives are mutually exclusive.*
Modals:

(30') $[\![must\ q]\!]^{w,f,o} \iff \boxplus(\{f(w) \cup X \big| X \subseteq o(w)\})(q)$

(36) $\iff \underline{\boxplus}(\leq_{\{f(w) \cup X \big| X \subseteq o(w)\}})(q)$

➽ Same truth conditions as the premise-semantic interpretation. (Proof omitted.)

Conditionals:

(31') $[\![p > q]\!]^{w,f,o} \iff \boxplus(\{f(w) \cup p \cup X \big| X \subseteq o(w)\})(q)$

(37) $\iff \underline{\boxplus}(\leq_{\{f(w) \cup p \cup X \big| X \subseteq o(w)\}})(q)$

BUT the following are equivalent *only if the sets in X are disjoint*:

(32') $[\![p > q]\!]^{w,f,o} \iff \boxplus(\{f(w) \cup \{x\} \cup X \big| x \in p, X \subseteq o(w)\})(q)$

(38) $\not\Longleftrightarrow \underline{\boxplus}(\leq_{\{f(w) \cup \{x\} \cup X \big| x \in p, X \subseteq o(w)\}})(q)$

- Each alternative in X creates its own "local ranking" of worlds.
- With overlap, some worlds may participate in multiple "local rankings" with unwanted interactions:
  - Worlds at which fewer alternatives are true cannot outrank worlds at which more alternatives are true, even if they should according to the ordering source.
  - Worlds at which more alternatives are true may outrank worlds which fewer alternatives are true, even if they should not according to the ordering source.
- Worlds that should be "locally optimal" may end up outranked by others.

➽ If constituent alternatives are mutually exclusive, that can't happen.

8 Back to Inquisitive Semantics

Long-term goal: An account of modality and conditionals which naturally extends to unconditionals

Goal of this section: Address some of the isses that will arise in implementing such an account.

Two places to start from

Conditionals: a. Take a binary conditional operator (say, '>') as basic;

b. represent unconditional modals as conditionals with tautological antecedents;

c. ensure that inquisitive antecedents lead to an interpretation as an unconditional.

Modals: a. Take a unary modal operator (say, '$\boxplus$') as basic;

b. interpret conditionals via the Ramsey Test (temporary update with the antecedent, interpretation of the consequent in the resulting state);

c. unconditional interpretation if the temporary update has *raised an issue*.

Some considerations:

- The modal approach can potentially yield a nice account of certain phenomena.
  - Modal subordination.

    (39) a. A thief might come in.
    b. He would take the silver.

    (40) a. If a thief comes in, he will take the silver.
    b. He will empty the frige, too.

  - Split modality.

    (41) a. You will stay unmarried, or you will marry a tramp.
    b. You'll become a nun, or the tramp will beat you regularly.
    c. Either way you'll have a miserable life.

    BUT it's an open empirical question whether interrogative updates always give rise to unconditional interpretations of subsequent modals.

    (42) A: Who's coming to the party?
    B: ?It'll be fun.

- The modal approach requires a way to represent "temporary updates" with non-inquisitive content (for *'if'*-clauses).
  A step in this direction may be something like the *attentive* update of Ciardelli et al. (to appear). See also Kaufmann (2000); Roelofsen (2009).

What's needed in any case

Modal base:
- We may start by using the *states* of Groenendijk and Roelofsen (2009) as the modal domain (see Section 5 above).
- But this is ultimately unsatisfactory: Unless we define a *pointwise* interpretation of modals at individual indices (or at sub-states), we only get an interpretation of modals etc. as *tests*.

➥ Define the modal base pointwise at possible worlds
(Doxastic states ⇒ common ground)
Let IS-style updates operate on that modal base.

Ordering source: Assigned pointwise at worlds like the modal base.

Modals etc.:
- We know from Section 7 that an ordering semantics will not work for inquisitive antecedents unless their possibilities are guaranteed to be mutually exclusive.
  ➥ Empirical question: Are they?
- In any case: A premise-semantic interpretation is available; see the ingredients in Section 6.

9 Conclusions, open issues, next steps

- How should we handle conditionals with inquisitive antecedents *and* consequents?

  Ciardelli et al. (to appear); Groenendijk and Roelofsen (2010): $?p \rightarrow ?q$ denotes a set of possibilities, each a conjunction of conditionals, each corresponding to one way of mapping possibilities in the denotation of $?p$ to possibilities in the denotation of $?q$.

  This may be right; but empirically, do such sentence exist, and if so, what do they mean?

  (43) a. ?Whether John or Mary comes to the party, what will they bring?
  b. ?Whoever comes to the party, they will sing or dance.
  c. ...

- The list goes on and on ...

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