

Unless, Exceptionality, and Conditional Strengthening

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Overview

Does *unless* represent a challenge to compositionality, or can it be given a unified account (invariant to quantificational context)?

- ▶ Introduction; “Higginbotham’s puzzle”
- ▶ The current account (von Stechow 1992, Leslie 2008)
 - ▶ *Unless* as an exceptive operator on quantifier domains
 - ▶ Issues; quantifiers and biconditionality
- ▶ A pragmatic perspective on *unless*
 - ▶ Evidence for a pragmatic treatment
 - ▶ Revising the semantics
- ▶ *Unless* vs *if not*
 - ▶ Conditional strengthening
 - ▶ Implicature and presupposition
- ▶ Conclusions and questions

Truth-functional *unless*

The classical negative material conditional seems too weak for *unless*:

- (1) a. q **unless** $p = \neg p \rightarrow q$
b. John will succeed unless he goofs off
 \rightsquigarrow John goofs off or John succeeds

But the negative biconditional is too strong in certain cases:

- (2) a. q **unless** $p = \neg p \leftrightarrow q$
b. No student will succeed unless he works hard
 \rightsquigarrow No student can succeed without working hard, and all students who work hard succeed

Noncompositional *unless*? Higginbotham's puzzle

The problem, first noted by Higginbotham (1986), is that *unless* seems to compose differently with positive and negative quantifiers:

- ▶ Under positive quantifiers, we want biconditionality:

(3)a. Every student will succeed unless he goofs off.

\rightsquigarrow *All students are such that they will succeed if they do not goof off and will not succeed if they do goof off.*

- ▶ Under negative quantification, we want a one-directional conditional:

(3)b. No student will succeed unless he works hard.

\rightsquigarrow *No student is such that he will succeed without working hard.*

[In fact, even one-directional material *if not* does not compose properly under the negative quantifier – this is Higginbotham's original observation.]

Unless as an exceptive operator

The most current account treats *unless* as an exceptive operator.
An *unless*-statement:

- a) asserts a generalization
- b) asserts the existence of an exception to that generalization

Unless modifies a quantifier by subtracting from its domain, and asserts that the complement of the *unless*-clause is the unique smallest exception to the quantified statement (von Stechow 1992)

- (3) a. Every student will succeed unless he goofs off.
↔ Every student but the goofing ones will succeed and any set of non-succeeding students must contain all of the students who goof off.

Unless as an exceptive operator

Exceptionality improves on the truth-functional account:

- ▶ replaces material implication with something like a Lewis-Kratzer restrictive conditional
- ▶ Leslie's (2008) revisions also capture the biconditionality/unidirectionality problem

$$(4) Q[C]M \text{ unless } R := Q[C \wedge \neg R]M \wedge Q[C \wedge M]\neg R$$

Q = the quantifier (or quantificational adverb)

C = domain of quantification

M = nuclear scope of the quantifier

R = *unless*-complement or excepted set

Unless as an exceptive operator

$$(4) \quad Q[C]M \text{ unless } R := Q[C \wedge \neg R]M \wedge Q[C \wedge M]\neg R$$

(3) a. Every student will succeed unless he goofs off.

$$\forall x[\text{st}(x) \wedge \neg \text{goof}(x)]\text{succ}(x) \wedge \forall x[\text{st}(x) \wedge \text{succ}(x)]\neg \text{goof}(x)$$

b. No student will succeed unless he works hard.

$$\neg \exists x[\text{st}(x) \wedge \neg \text{work}(x)]\text{succ}(x) \wedge \neg \exists x[\text{st}(x) \wedge \text{succ}(x)]\neg \text{work}(x)$$

$$\neg \exists x[\text{st}(x) \wedge \neg \text{work}(x)]\text{succ}(x)$$

Since “No As are Bs” logically entails “No Bs are As,” formula (4) gets biconditionality to evaporate precisely in the negative contexts.

Problems with the exceptive account

Von Steupel claims that *unless* can only co-occur with universal quantifiers, but the following examples (and many others like them) occur naturally:

- (5) a. Most in the US support a higher minimum wage, unless it costs jobs.
- b. Some diners won't get water unless they ask.
- c. Smoking kills half of smokers unless they quit.

(4) makes some underexplored predictions for this type of *unless*-statement, which start to seem peculiar when considered carefully.

Problems with the exceptive account

(4) $Q[C]M$ **unless** $R := Q[C \wedge \neg R]M \wedge Q[C \wedge M]\neg R$

(6) Most students will succeed unless they goof off.

$\text{most } x[\text{st}(x) \wedge \neg\text{goof}(x)]\text{succ}(x) \wedge \text{most } x[\text{st}(x) \wedge \text{succ}(x)]\neg\text{goof}(x)$

Suppose:

There are 12 students. 4 goof off. 6 of the non-goofing students succeed. 3 of the goofing students succeed.

- ▶ 6 of 8 non-goofing students succeed
- ▶ 6 of 9 successful students are non-goofing

But most of the students who do goof off also succeed (3 of 4, which is the same success rate as non-goofing students). (6) seems inappropriate here.

Problems with the exceptive account

Is *unless* is **semantically** biconditional in positive contexts?

- (7) Mantou is always late unless she's already out before we meet, but she's often just less late then.

This suggests that Mantou being out is necessary to prevent her from being late, but is not always enough. If *unless* were semantically biconditional in positive contexts, this ought to be contradictory.

A pragmatic perspective

Both *if not* and *not if* directions are relevant for *unless*, but the exceptive account goes wrong in giving them equal status.

Claim:

The *not if* direction is not entailed by an *unless*-statement, and the biconditionality associated with positive *unless*-statements is actually a generalized conversational implicature (GCI) in the sense of Levinson (2000)

A pragmatic perspective

Evidence for the pragmatic status of the *not if* inference:

1. It can be **reinforced** without redundancy:

(8) Always be yourself, unless you are Fernando Torres. Then always be someone else.

Compare: Always be yourself, unless you are Fernando Torres.
?Otherwise always be yourself.

2. It can be **questioned** without contradiction:

(9) The answer is no unless you ask. If you do ask the answer might be no.

Compare: The answer is no unless you ask. #If you don't ask the answer might be yes.

3. It is **defeasible**:

(6) Mantou is always late unless she's already out before we meet, but she's often just less late then.

Compare: #Mantou is always late unless she's already out before we meet, but she's sometimes on time when she's not out before.

A pragmatic perspective

Evidence for a GCI classification:

- ▶ *Not if* can be **suspended** without causing infelicity, unlike presuppositions:

(10) The student might not fail if he studies, but he'll fail unless he studies.

Compare: ?There might not be a student, but the student will fail unless he studies.

- ▶ *Not if* is not **redundant** when backgrounded, unlike a conventional implicature (Potts 2005):

(11) John won't fail if he studies. He will fail unless he studies.

Compare: John is a student. John, ?the student, will fail unless he studies.

Biconditionality is a “default,” and not a particularized conversational implicature. The inference resembles conditional perfection (Geis & Zwicky 1971):

(12) I'll give you five dollars if you mow the lawn.

↪ I'll give you five dollars if and only if you mow the lawn.

A revised semantics for *unless*

Unless and *if not* are closely related: they share asserted content (the first conjunct of the exceptive account).

Unless necessarily restricts a quantifier, and a ‘bare’ conditional is presumed to contain a covert universal:

$$(13) \text{ must } q \text{ **unless** } p := \forall w[\neg p(w)]q(w)$$

Leslie (2008) argues that conditional operators must be able to restrict either a modal quantifier or a quantificational determiner:

- (14)
- a. No one will succeed unless he works hard.
 - b. **Lewis-Kratzer:** $\neg\exists x(\forall w[\neg\text{work-hard}(x, w)]\text{succeed}(x, w))$
 - c. **Modalized restrictor (Leslie):**
 $\forall w(\neg\exists x[\neg\text{work-hard}(x, w)]\text{succeed}(x, w))$

The difference between *unless* and *if not*

Why are *unless* and *if not* pragmatically different?

- (15)
- a. John will leave unless Bill calls him.
 - b. John will leave if Bill does not call him.

These seem to differ precisely in the degree to which they invite biconditionality – it is strong with *unless* and relatively weak with *if not*

Conditional strengthening

In general, conditionals are accompanied by a presumption about the circumstances under which they are uttered (felicitously):

(16) **Conditional strengthening:**

Given a conditional operator *COND* and two propositions *p* and *q*, the statement *q COND p* is best asserted when the speaker is unwilling/unable to assert the unqualified proposition *q*.

(14) No one will succeed unless he works hard.

↷ The speaker is unwilling/unable to assert “No one will succeed.”

Conditional strengthening

Von Stechow (2001) treats conditional strengthening as implicature, but it is very hard to defeat:

(17) ?John will leave if Bill does not call. Actually, he will leave no matter what.

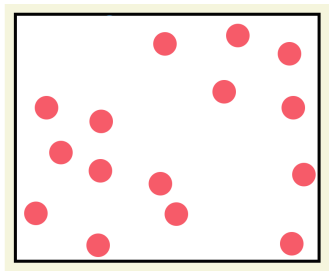
In fact, conditional strengthening here behaves like Lauer's (2013) "Need a Reason" (NaR) implicatures.

(18) John is in Paris or he is in London.
↪ The speaker is unwilling/unable to say which.

A general preference for less complex utterances can only be overridden if there is a communicative reason to do so.

Conditional strengthening

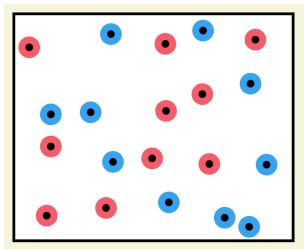
The crucial distinction between *unless* and *if not* is that conditional strengthening is actually stronger than an (NaR) implicature with *unless*.



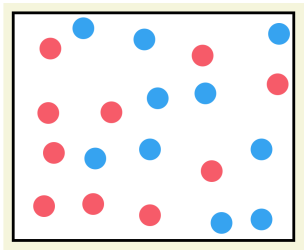
- (19) a. Every marble is red or blue.
b. Every marble is red.

(19)a is **true**, even though b is much better.

Conditional strengthening



- (20)
- a. Every marble has a dot unless it is blue.
 - b. Every marble has a dot if it is not blue.
 - c. Every marble has a dot.



- (21)
- a. No marble has a dot unless it is blue.
 - b. No marble has a dot if it is not blue.
 - c. No marble has a dot.

Conditional strengthening

- ▶ Conditional strengthening on *if not* is suspendable, but *unless*-statements cannot be used without it.
- ▶ The “false” judgements for the *unless*-examples are on par with naive “false” judgements for “The King of France is bald.”
- ▶ *Unless*-statements are infelicitous if there is no recoverable reason for singling out the excepted set.
- ▶ Conditional strengthening behaves like a presupposition (for *unless*)

Conditional strengthening and biconditionality

Can this help us explain the biconditionality implicature?

Conditional statements q unless p often suggest that there are (epistemically) relevant situations such that $\neg q$.

(22) John will leave unless Bill calls.

\rightsquigarrow There are possible situations in which John does not leave.

- ▶ (22) divides the set of worlds in two ways – by whether Bill calls and by whether John leaves.
- ▶ Minimally, we know $\{w : \neg \text{call}(B, J, w)\} \subseteq \{w : \text{leave}(J, w)\}$
- ▶ But $\{w : \neg \text{leave}(J, w)\}$ could still be the empty set
- ▶ Strengthening fixes that it is not: $\{w : \neg \text{leave}(J, w)\} \neq \emptyset$

Conditional strengthening and biconditionality

- ▶ Logically:

$$\{w : \neg \text{leave}(J, w)\} \subseteq \{w : \text{call}(B, J, w)\}$$

- ▶ Knowing that there are situations where John doesn't leave provides a “foothold” for biconditionality

- ▶ Biconditionality:

$$\{w : \neg \text{leave}(J, w)\} = \{w : \text{call}(B, J, w)\}$$

Since conditional strengthening is a precondition for the use of an *unless*-conditional, we are always in this state with a felicitous *unless*-statement.

Concluding thoughts

- ▶ The two conditional directions associated with *unless* do not have the same status: *if not* is asserted and *not if* is an implicature.
- ▶ The difference between *if not* and *unless* has to do with conditional strengthening
- ▶ The fact that conditional strengthening is a presupposition for *unless* opens the way to explaining why *unless* seems so strongly biconditional in certain cases
- ▶ Why is there a difference in biconditionality between positive and negative contexts?
- ▶ Von Stechow classes *unless* with other exceptive operators (e.g. *except for*, *but*). Is the same sort of pattern of presupposition/implicature/quantificational context active with these?

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