

# *Unless*, Exceptionality, and Conditional Strengthening

Prerna Nadathur

Department of Linguistics  
Stanford University

October 12, 2013

# Outline

What is the meaning of the connective *unless*? Can we give *unless* a unified account?

- ▶ Truth-functional accounts
  - ▶ The classical account; biconditionality
  - ▶ Noncompositionality?
- ▶ Exceptionality
  - ▶ *Unless* as an exceptive operator on quantifier domains
  - ▶ Uniqueness
- ▶ A pragmatic approach
  - ▶ Evidence for a pragmatic treatment
  - ▶ Pragmatic classification
- ▶ *Unless* and conditional strengthening
- ▶ Concluding questions

# Truth-functional *unless*

The classical treatment (Reichenbach 1947, Quine 1959) puts *unless* in the class of two-place truth-functional connectives, as the negative conditional *if not*:

## Example (1)

- a. John eats steak unless he eats lobster.
- b. John eats steak if he does not eat lobster.

## Truth-functional *unless*

The classical treatment (Reichenbach 1947, Quine 1959) puts *unless* in the class of two-place truth-functional connectives, as the negative conditional *if not*:

### Example (1)

- a. John eats steak unless he eats lobster.
- b. John eats steak if he does not eat lobster.

This seems ok at first, but since we're speaking truth-functionally, we have to accept that (1)c has the same meaning as (1)a:

### Example (1)

- c. John eats steak or he eats lobster.

# Truth-functional *unless*

This suggests a biconditional interpretation for *unless*:

Proposal 1:

$$P \text{ unless } Q := P \leftrightarrow \neg Q$$

# Truth-functional *unless*

This suggests a biconditional interpretation for *unless*:

Proposal 1:

$$P \text{ unless } Q := P \leftrightarrow \neg Q$$

This works for (2)a and b, but doesn't come out right for (2)c:

Example (2)

- a. John will succeed unless he goofs off.
- b. Everyone will succeed unless he goofs off.
- c. No one will succeed unless he goofs off.

On this account of *unless*, the truth conditions of (2)c are that for each  $x$ ,  $x$  either both succeeds and goofs off, or does neither. But these aren't the right truth conditions!

# Noncompositional *unless*? Higginbotham's puzzle

The problem, first noted by Higginbotham (1986), is that *unless* doesn't seem to compose the same way with positive and negative quantifiers!

# Noncompositional *unless*? Higginbotham's puzzle

The problem, first noted by Higginbotham (1986), is that *unless* doesn't seem to compose the same way with positive and negative quantifiers!

- ▶ Under positive (or no) quantifiers, we want biconditionality:

(3) John will succeed unless he goofs off.

⇒ *John will succeed if he does not goof off, and he will not succeed if he does – exactly one of success or goofing off will occur.*



# Noncompositional *unless*? Higginbotham's puzzle

The problem, first noted by Higginbotham (1986), is that *unless* doesn't seem to compose the same way with positive and negative quantifiers!

- ▶ Under positive (or no) quantifiers, we want biconditionality:

(3) John will succeed unless he goofs off.

*⇒ John will succeed if he does not goof off, and he will not succeed if he does – exactly one of success or goofing off will occur.*

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

(4) No one will succeed unless he goofs off.

*⇒ No one can succeed without goofing off (but goofing off does not necessarily guarantee success).*

In fact, even the one-direction *if not* doesn't work under negative quantifiers (Higginbotham's original observation).

# Exceptive *unless* (Geis 1973, Dancygier 1975, Zuber 1999)

This suggests that a unified truth-functional account of *unless* is untenable.

# Exceptive *unless* (Geis 1973, Dancygier 1975, Zuber 1999)

This suggests that a unified truth-functional account of *unless* is untenable.

More recently, *unless* has been treated as an exceptive operator. The most formal proposal for this is from von Stechow (1992, 1993, 1994):

## Proposal 2:

$Q[C] M \text{ unless } R$

$:= (Q [C - R] [M]) \wedge (\forall A (Q [C - A] [M]) \rightarrow R \subseteq A)$

where  $Q$  = (adverbial) quantifier,  $C$  = the set of contextually relevant circumstances,  $M$  = the set being quantified over, and  $R$  = the exceptional set.  $A$  is an arbitrary set of situations.

# Breaking down the exceptive account

Von Fintel's account has two pieces:

(5) John eats steak unless he eats lobster.

# Breaking down the exceptive account

Von Fintel's account has two pieces:

(5) John eats steak unless he eats lobster.

The first part captures the *if not* part of *unless*:

$Q [C - R] [M]$  IF NOT

$\forall [C - \{\text{lobster}(j)\}][\{\text{steak}(j)\}]$

$\Rightarrow$  *In all relevant situations where John doesn't eat lobster, he eats steak.*

# Breaking down the exceptive account

Von Fintel's account has two pieces:

(5) John eats steak unless he eats lobster.

The first part captures the *if not* part of *unless*:

$Q [C - R] [M]$  IF NOT

$\forall [C - \{\text{lobster}(j)\}][\{\text{steak}(j)\}]$

$\Rightarrow$  *In all relevant situations where John doesn't eat lobster, he eats steak.*

The second part captures the *not if* direction:

$\forall A (Q [C - A] [M]) \rightarrow R \subseteq A$  NOT IF/Uniqueness

$\forall A (\forall [C - A] [\{\text{steak}(j)\}]) \rightarrow \{\text{lobster}(x)\} \subseteq A$

$\Rightarrow$  *If we remove an arbitrary set of situations and all the remaining ones are steak-eating situations, we must have removed all the lobster-eating situations.*

# The exceptive account

This makes it clear that the exceptive account achieves a biconditional-type interpretation for positive quantifiers.

Unfortunately, it's precisely for this reason that it STILL doesn't work for negative quantifiers\*:

- (6) John never succeeds unless he works hard.  
⇒ *No relevant situations where John doesn't work hard are success situations and no non-success situations are hard-work situations.*

The situation gets even worse if we try to quantify over individuals. . .

\*Leslie (2008) has a clever fix for the uniqueness clause that exploits the symmetry of the negative determiner. Her account runs into other problems, mostly relating to quantifier interaction, which I won't talk about today.

## A new approach to *unless*?

Even though von Fintel's uniqueness clause doesn't quite work out, we don't want to throw out the whole analysis. The *if not* conjunct is a definite improvement:



## A new approach to *unless*?

Even though von Fintel's uniqueness clause doesn't quite work out, we don't want to throw out the whole analysis. The *if not* conjunct is a definite improvement:

### Example (7)

John never succeeds unless he works hard.

⇒ *None of the situations in which John doesn't work hard are ones in which he succeeds.*

Since the semantics seem to work out when we just drop uniqueness, why don't we assume that that's actually what's happening?

# The situation

- ▶ Higginbotham's puzzle seems rooted in the behavior of the uniqueness clause.
- ▶ In general, we want uniqueness for regular or positively quantified examples, but we don't want it in the negative cases.

# The situation

- ▶ Higginbotham's puzzle seems rooted in the behavior of the uniqueness clause.
- ▶ In general, we want uniqueness for regular or positively quantified examples, but we don't want it in the negative cases.
- ▶ In fact, it's not just in negative cases where uniqueness seems to go away:
  - (8) John always succeeds unless he goofs off.

# The situation

- ▶ Higginbotham's puzzle seems rooted in the behavior of the uniqueness clause.
- ▶ In general, we want uniqueness for regular or positively quantified examples, but we don't want it in the negative cases.
- ▶ In fact, it's not just in negative cases where uniqueness seems to go away:  
(8) John always succeeds unless he goofs off.

## Conclusion:

We can't account for *unless* as fully semantic. Uniqueness (the *not if* direction) is actually a pragmatic aspect of the meaning of *unless*.

# Evidence for a pragmatic treatment

- ▶ Uniqueness can be **reinforced** without redundancy:  
(9) John will leave unless Bill calls, and he will stay if Bill does.

# Evidence for a pragmatic treatment

- ▶ Uniqueness can be **reinforced** without redundancy:  
(9) John will leave unless Bill calls, and he will stay if Bill does.
- ▶ Uniqueness can be **questioned** (and almost denied) without contradiction:  
(10)
  - a. John will leave unless Bill calls, but he might leave even if Bill does.
  - b. John will leave unless Bill calls, but he'll probably leave anyway.

# Evidence for a pragmatic treatment

- ▶ Uniqueness can be **reinforced** without redundancy:  
(9) John will leave unless Bill calls, and he will stay if Bill does.
- ▶ Uniqueness can be **questioned** (and almost denied) without contradiction:  
(10)
  - a. John will leave unless Bill calls, but he might leave even if Bill does.
  - b. John will leave unless Bill calls, but he'll probably leave anyway.
- ▶ Uniqueness is **contextually cancellable**:  
(11)
  - a. John cheated unless he wrote his own questions.
  - b. John cheated unless he wrote his own questions and his own answers.

# Evidence for a pragmatic treatment

- ▶ Uniqueness can be **reinforced** without redundancy:  
(9) John will leave unless Bill calls, and he will stay if Bill does.
- ▶ Uniqueness can be **questioned** (and almost denied) without contradiction:  
(10)
  - a. John will leave unless Bill calls, but he might leave even if Bill does.
  - b. John will leave unless Bill calls, but he'll probably leave anyway.
- ▶ Uniqueness is **contextually cancellable**:  
(11)
  - a. John cheated unless he wrote his own questions.
  - b. John cheated unless he wrote his own questions and his own answers.

Uniqueness is **malleable**:

(12) John might leave unless Bill calls.



# Pragmatic uniqueness

What kind of a pragmatic inference is uniqueness?

# Pragmatic uniqueness

What kind of a pragmatic inference is uniqueness?

- ▶ We can rule out particularized conversational implicature: uniqueness is associated to a particular word, and is both relatively imperceptible and highly consistent.

# Pragmatic uniqueness

What kind of a pragmatic inference is uniqueness?

- ▶ We can rule out particularized conversational implicature: uniqueness is associated to a particular word, and is both relatively imperceptible and highly consistent.
  - ▶ Conventional implicatures are not malleable or reinforceable. They are also not backgroundable, and typically project out of attitude predicates (Potts 2005).
- (13)
- a. John won't leave if Bill calls, but he will leave unless Bill calls.
  - b. Mary believes that John will leave unless Bill calls – but he'll leave in any case.

# Pragmatic uniqueness

What kind of a pragmatic inference is uniqueness?

- ▶ We can rule out particularized conversational implicature: uniqueness is associated to a particular word, and is both relatively imperceptible and highly consistent.
- ▶ Conventional implicatures are not malleable or reinforceable. They are also not backgroundable, and typically project out of attitude predicates (Potts 2005).
  - (13) a. John won't leave if Bill calls, but he will leave unless Bill calls.
  - b. Mary believes that John will leave unless Bill calls – but he'll leave in any case.
- ▶ The only remaining candidate is generalized conversational implicature (GCI)

# Uniqueness as a GCI

- ▶ GCIs are “default” inferences, which “capture our intuitions about a preferred or normal interpretation.” (Levinson 2000)

# Uniqueness as a GCI

- ▶ GCIs are “default” inferences, which “capture our intuitions about a preferred or normal interpretation.” (Levinson 2000)
- ▶ According to Grice (1975) and Levinson (2000), GCIs have the following properties:
  - ▶ defeasibility
  - ▶ reinforcability
  - ▶ calculability
  - ▶ nonconventionality
  - ▶ nondetachability

# Uniqueness as a GCI

- ▶ GCIs are “default” inferences, which “capture our intuitions about a preferred or normal interpretation.” (Levinson 2000)
- ▶ According to Grice (1975) and Levinson (2000), GCIs have the following properties:
  - ▶ defeasibility
  - ▶ reinforcability
  - ▶ calculability
  - ▶ nonconventionality
  - ▶ nondetachability
- ▶ It's not clear that these characteristics necessarily pick out a unified class of inferences.

# Uniqueness as a GCI

An inference (or implicature) is **nondetachable** if an alternative means of communicating the same semantic content carries the same implicature.



# Uniqueness as a GCI

An inference (or implicature) is **nondetachable** if an alternative means of communicating the same semantic content carries the same implicature.

The closest paraphrase we have for *unless* is *if not*:

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

This does appear to carry the suggestion that John's departure will be averted (or at least affected) if Bill calls.

# Uniqueness and conditional strengthening

Von Stechow (2001) observes a “strengthening” property on conditionals.

- (15) John will leave if Bill calls (but he won't leave no matter what).

# Uniqueness and conditional strengthening

Von Stechow (2001) observes a “strengthening” property on conditionals.

- (15) John will leave if Bill calls (but he won't leave no matter what).

This looks a lot like *unless*; including, crucially, cases where uniqueness doesn't hold:

- (16) a. John will leave unless Bill calls (but he won't leave no matter what).  
b. John never leaves unless Bill calls (but he doesn't always stay).

# Uniqueness and conditional strengthening

- ▶ Von Steinhilber's story about conditional strengthening is that it is a scalar implicature arising from the fact that the speaker could have asserted an unconditional (if it were true).

# Uniqueness and conditional strengthening

- ▶ Von Stechow's story about conditional strengthening is that it is a scalar implicature arising from the fact that the speaker could have asserted an unconditional (if it were true).
- ▶ He argues that conditional strengthening can become conditional perfection (biconditionality) given certain conversational conditions

# Uniqueness and conditional strengthening

- ▶ Von Fintel's story about conditional strengthening is that it is a scalar implicature arising from the fact that the speaker could have asserted an unconditional (if it were true).
- ▶ He argues that conditional strengthening can become conditional perfection (biconditionality) given certain conversational conditions
- ▶ We can give a similar story about *unless*: the scale might consist of [*P unless Q*] on the weaker end and something like [*P without exception*] on the higher end.

# Uniqueness and conditional strengthening

- ▶ Von Stechow's story about conditional strengthening is that it is a scalar implicature arising from the fact that the speaker could have asserted an unconditional (if it were true).
- ▶ He argues that conditional strengthening can become conditional perfection (biconditionality) given certain conversational conditions
- ▶ We can give a similar story about *unless*: the scale might consist of  $[P \text{ unless } Q]$  on the weaker end and something like  $[P \text{ without exception}]$  on the higher end.
- ▶ Problem solved? *Unless* is a free exceptive, and restrictiveness/uniqueness are handled by scalar implicature.

## Some concluding thoughts

- ▶ There probably is a shared story for conditional strengthening and the aspects of *unless* that go beyond *if not*.



## Some concluding thoughts

- ▶ There probably is a shared story for conditional strengthening and the aspects of *unless* that go beyond *if not*.
- ▶ A related question is whether this can be related to the pragmatic “enrichment” that all logical connectives seem to get.

## Some concluding thoughts

- ▶ There probably is a shared story for conditional strengthening and the aspects of *unless* that go beyond *if not*.
- ▶ A related question is whether this can be related to the pragmatic “enrichment” that all logical connectives seem to get.
- ▶ There is also something of a “lexicity effect” here: we’ve noticed that *unless* attracts uniqueness more naturally/strongly than *if not* does. Perhaps *unless* is pushed towards this meaning because of the availability of *if not*.

## Some concluding thoughts

- ▶ There probably is a shared story for conditional strengthening and the aspects of *unless* that go beyond *if not*.
- ▶ A related question is whether this can be related to the pragmatic “enrichment” that all logical connectives seem to get.
- ▶ There is also something of a “lexicality effect” here: we’ve noticed that *unless* attracts uniqueness more naturally/strongly than *if not* does. Perhaps *unless* is pushed towards this meaning because of the availability of *if not*.
- ▶ It seems like uniqueness (and by extension strengthening) will have to be classified as GCIs from the available options. But this seems to be moving away from the Levinsonian heuristic-based picture.