Exhaustivity, relatedness and the final rise
– and of course inquisitive semantics

Matthijs Westera
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Transcription key:
… = final rise
. = final fall
Focused constituent with emphasis
(Constant 2012)

Part I: Exhaustivity and relatedness

1.1 The puzzle

(1) Q: Was John or *Mary* at the party?
R: *John* was. → Mary wasn't. 'exhaustivity'

- Exhaustivity is not a contribution of the focus (Horn, 1972)

- Exhaustivity has been considered a prime example of a *conversational implicature*.

> **Conversational implicature (Grice, 1975)**:
> something implicated by the speaker, which the hearer can derive purely from what is said plus her assumption that the speaker is *cooperative*.

- For the exhaustivity of (1), the derivation goes as follows:
  1. The responder didn't say that Mary was there too.
  2. The responder should have said so, had she been able to. (due to maxim of Quantity)
  3. Hence, she must not have the belief that Mary was there.
  !4. Presumably the responder has an opinion regarding Mary's presence.
  5. The responder believes that Mary was not there

- The step from 3 to 5 is called the *Epistemic Step* (Sauerland, 2005), and the assumption in 4 is made by, e.g., (Spector, 2007; Van Rooij & Schulz, 2006; Alonso-Ovalle, 2008).
(among everyone else)
- Assumption 4 makes this a case of *underspecification*; instead of conv. implicature.

Problem:
- It is hard to think of a circumstance where (1) does not implicate exhaustivity.
- To treat exhaustivity as underspecification is to admit defeat.

Goal: To give a properly Gricean explanation of exhaustivity as conversational implicature.

1.2 Proposal

- The maxim of Relation is the key. (GroSto (1984) already said that Quantity cannot be the solution.)
- This maxim, recall, is supposed to enable implicatures as in (2):

(2) Q: Was *John* at the party?
R: It was *raining*. → John loves (or hates) rainy parties

- I assume the following maxim of Relation:

Maxim of Relation
A speaker with knowledge state s (set of worlds), should give A in response to Q only if A, restricted to s, entails Q.

This is basically a weaker version of:
– 'Pragmatic answer' (GroSto 1984)
– 'Contextual entailment' (Roberts 2012).

- What this maxim achieves depends on which semantics and entailment we use.
  - The more *fine-grained* our semantics, the more *sparse* entailment, and hence the *stronger* the Relation implicatures we can derive.
  - How fine-grained should the semantics be?

(3) Q: Was John or *Mary* at the party?
R: *John*, and maybe *Mary*. / At least *John* was.

  - Our best bet is a semantics fine-grained enough to distinguish (1) from (3).

Unrestricted Inquisitive Semantics (Ciardelli, 2009)

- Meanings are regarded as *proposals* to update the common ground in one of several ways;
  - And as *drawing attention to* the proposed updates. (Ciardelli, *et al.*, 2009)
- *Possibility*: A set of possible worlds
- *Proposition*: A set of possibilities, always containing $\varnothing$ (ugly but helpful)

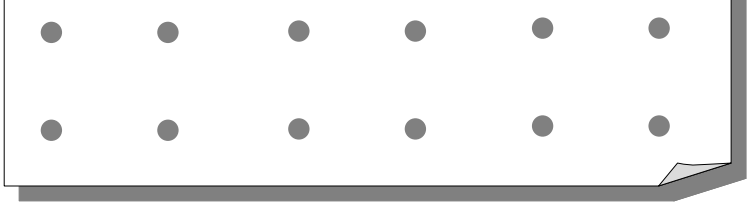
For p a proposition letter, φ, ψ formulae:

1. $[p] = \{\{w \in \boldsymbol{W} | w(p) = \mathit{true}\}, \varnothing\}$
2. $[\bot] = \{\varnothing\}$
3. $[\varphi \vee \psi] = [\varphi] \cup [\psi]$
4. $[\varphi \wedge \psi] = [\varphi] \sqcap [\psi]$ *(where* $A \sqcap B = \{a \cap b : a \in A, b \in B\}$*)* → 'pointwise intersection'
5. $[\varphi \to \psi] = \{\{w |$ *for all* $a \in [\varphi]$, *if* $w \in a$, *then* $w \in f(a)\} | f : [\varphi] \to [\psi]\}$ → if φ and ψ are atomic, this is just material implication.

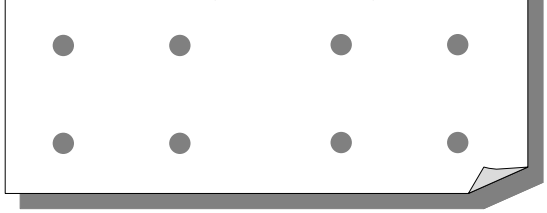
The examples in inquisitive semantics

(1) Q:	Was John or *Mary* at the party?	$p \vee q \vee \neg(p \vee q)$	(Groenendijk, *et al*, 2009)
R:	*John* was at the party	p	
(3) R:	*John* and maybe *Mary* / At least *John* was	$p \vee (p \wedge q)$	(Ciardelli, *et al.,* 2009; Coppock, *et al.*, ms.)
(2) Q:	Was John at the party?	$p \vee \neg p$	
R:	It was raining.	r	

Do-it-yourself diagrams for (1,3)



Do-it-yourself diagrams for (2)



Entailment (Westera, 2012)

$A \text{ entails } B,\ A \models B,\ \textit{iff}\ \exists C, B \sqcap C = A$ (+ its syntactic counterpart)

- This is a standard way to define entailment, only the *meanings* are now richer, and as a consequence, entailment is sparser.
  - r does not entail $p \vee \neg p$
  - p does not entail $p \vee q \vee \neg(p \vee q)$ "this cannot be right!"
  - $p \vee (p \wedge q)$ does entail $p \vee q \vee \neg(p \vee q)$

- **Intuition**: entailment is sensitive to the possibilities a proposition draws attention to.
  For A to entail B, A should not leave any possibility of B *unattended*. (this intuition is formalized in part II)
- Hence, plugged into the maxim of Relation, it says: *do not leave possibilities unattended!*

1.3 Predictions

For (2):
- For r to entail $p \vee \neg p$, it must be restricted to the info that $r \rightarrow p$ or $r \rightarrow \neg p$.
- Hence, to comply with Relation, the speaker must know either $r \rightarrow p$ or $r \rightarrow \neg p$.

For (3,1):
- $p \vee (p \wedge q)$ entails $p \vee q \vee \neg(p \vee q)$ hence for (3) we predict no Relation implicature.
- For p to entail $p \vee q \vee \neg(p \vee q)$ it must be restricted to $p \rightarrow q$ or $p \rightarrow \neg q$.
- Hence, for (1), we predict:

  ...
  3. The responder does not have the belief that q (as before, via Quantity)
  4. She must believe either $p \rightarrow q$ or $p \rightarrow \neg q$ (maxim of Relation)
  5. She does believe that p (maxim of Quality)
  6. She cannot believe $p \rightarrow q$, hence must believe $p \rightarrow \neg q$
  7. Hence, she must believe $\neg q$ → exhaustivity!

1.4 Summary:

- Exhaustivity is a conversational implicature!

- The only real innovation is to use unrestricted inq. sem.
  - ...which we need anyway to distinguish (1) and (3).

Some other applications:
- 'embedded' implicatures
- numerals vs. at least
- Rise-fall-rise!

- This comes with an entailment, plugged into the maxim of Relation, that is strict enough.

- Speakers/hearers care about what they draw attention to/from.

Part II: Relatedness and the final rise

2.1 Problems for existing work

- Gunlogson (2008): Final rise indicates the speaker's *uncertain commitment* to what is said:

(4) Q: What is your favourite colour?
R: Blue... → I'm not sure whether blue is really my favourite.

- Constant (2012): Rise-fall-rise (focus+final rise) indicates uncertainty regarding the truth of *non-dispelled alternatives*. → non-dispelled = neither inconsistent nor redundant

(5) Q: Was John or *Mary* at the party? (i.e. (1), but with final rise)
R: *John* was... → Not sure about Mary.

It is motivated by the infelicity of final rise with *alternative-disspelling focus*:

(8) Q: Was John or *Mary* at the party?
R: # They *both* were...

- Final rise has been associated with 'emotional' content, friendliness, politeness, submissiveness, etc. (e.g., Gussenhoven, 2004). (not our (direct) concern today)

Problems:

- Constant's account is *non-compositional*, unrelated to, e.g., Gunlogson's final rise.
  - A unified account of final rise and rise-fall-rise along *their* lines seems impossible.

- Gunlogson's account of the final rise is limited to a reading of (4) of *qualitative* uncertainty:
  - **Quality**: I'm not sure whether this is really my favourite colour.
  - **Quantity**: Is that detailed enough? Sky on a clear winter's day blue?
  - **Manner**: Is that even a colour? My English is not so good.
  - **Relation**: [strange for (4), but salient for (6), also without the focus]

(6) Q: Was *John* at the party?
R: It was *raining*... → Perhaps John's presence depended on the rain? (i.e. (2), but with final rise)

Goal: A unified account of the semantics of final rise and rise-fall-rise.

2.2 Proposal

- I propose that the final rise indicates *uncertain cooperativity*.
- I assume the effect of final rise is *non-at-issue* content (Simons, *et al*., 2010).

Contribution of final rise
For a natural language expression α, with $<\alpha>$ its translation into logic, let:
– At-issue(α...) = $<\alpha>$
– Non-at-issue(α...) = Non-at-issue(α) $\wedge$ < 'I'm uncertain whether I'm being cooperative' >

Claims:

1. Constant's rise-fall-rise = uncertain compliance with the maxim of Relation. → today
2. Focus of rise-fall-rise makes the uncertain Relation reading especially salient → also today
3. Gunlogson's final rise = uncertain compliance with the maxim of Quality.
4. All other readings = uncertain compliance with some maxim or other.

- Claims 3 and 4 are *programmatic*: as long as the uncertainty pertains to aspects of cooperativity, there is no reason why this couldn't be described in terms of a maxim.
  (Gunlogson shows, then, that the maxim of Quality is very specific)

Section 2.3 → predictions of uncertain compliance with Relation; 2.4 → establish claims 1 & 2.

2.3 Predictions of uncertain compliance with Relation

Assuming the same maxim of Relation and logical translations for (5,6) as for (1,2), we predict for (6):

- For r to entail $p \vee \neg p$, it must be restricted to the info that $r \rightarrow p$ or $r \rightarrow \neg p$.
- Hence, *uncertain* compliance with the maxim of Relation entails that the speaker considers both possible, but knows neither.

For (5):

- For p to entail, $p \vee q \vee \neg(p \vee q)$ it must be restricted to $p \rightarrow q$ or $p \rightarrow \neg q$.
- Uncertain Relation entails that the speaker considers both possible, but knows neither.
- Hence, we predict:

1. She considers possible $p \rightarrow q$ and $p \rightarrow \neg q$, but believes neither (uncertain Relation)
2. She believes p (maxim of Quality)
3. Hence, she considers possible both q and $\neg q$, but believes neither.

2.4 Correspondence with Constant (2012)

Claim 1: Constant's account of rise-fall-rise can be captured in terms of uncertain Relation.

- Constant: rise-fall-rise indicates uncertainty regarding *non-dispelled alternatives*.
- In our theory, the final rise, conveying uncertain Relation, conveys uncertainty regarding the *unattended possibilities,* which block entailment (e.g., q for (1)).
- Non-dispelled alternatives are very much like our unattended possibilities:

Possibilities left unattended
For all propositions A, Q, where $A = \{a, \varnothing\}$ for some $a \in Q$:
(i) a non-empty possibility $a' \in Q$ is *left unattended* by A iff a' overlaps with, or is contained in, a.
(ii) A entails Q iff there is no such possibility.

For A,Q chosen more freely, this definition (and the intuition) doesn't apply... :(

Unattended vs. non-dismissed
For all propositions A, Q, where $A = \{a, \varnothing\}$ for some $a \in Q$:
A possibility $a \in Q$ is *non-dismissed* by A iff it is *left unattended* by A.

- All examples considered by Constant are such that the non-dismissed alternatives and unattended possibilities coincide, yielding the same predictions for both theories.
  - However, (7) has a possibility that is non-dismissed, but not left unattended:

(7) Q: Was John or *Mary* at the party?
R: At least *John* was...

(same as (3), but with final rise)

  - Because (7) complies with Relation, we predict that the final rise cannot indicate uncertain relatedness. (at least in the absense of another, implicit question)
  - Indeed, it seems that for (7), an *uncertain Quantity* reading is most prominent.

Claim 2: The focus of rise-fall-rise pragmatically restricts its range of possible readings

I assume:

Contribution of focus (Grice, Rooth, Krifka...)
The focus marks congruence with a question under discussion.

→ In InqSem, the question is obtained by replacing the focused constituents by existentially bound variables (Balogh, 2008).

In the case of rise-fall-rise:

- the congruence makes uncertain Manner unlikely;
- uncertain Quality would make the choice for one answer over the others arbitrary;
- and hence uncertain Quantity and Relatedness are the most prominent readings.

- Like Constant, we predict final rise with *alternative-dispelling focus* to be infelicitous:

(8) Q: Was John or *Mary* at the party?
R: # They *both* were...

  - The answer entails the question, hence no uncertain Relation reading is possible.
  - It is the most informative answer possible, hence no uncertain Quantity reading either.

2.5 Summary

- Treating the final rise as conveying uncertain cooperativity enables a unified account of final rise and rise-fall-rise (established for the latter, still programmatic for the rest).

- Crucial ingredient for rise-fall-rise is the same strict maxim of Relation we used in part I.

- Pragmatic concepts enter semantics.

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