Negation and exhaustification

A brief overview of the exhaustification account of SI

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1. Introduction

- In preparation for Benjamin Spector’s talk on **metalinguistic negation**, we’ll go over the perspective adopted by Spector and colleagues on the derivation of scalar implicatures

2. Negation

- Descriptive negation: truth-conditional
  - “It was not hot on Sunday. It was warm.”
  - “Mary does not have four cats. She has one.”
- Metalinguistic negation: non-truth-conditional (Horn 1985, 1989; Moeschler 2010):
  - “It was not hot on Sunday. It was blazing hot.”
  - “Mary does not have four cats. She has ten.”
2. Negation

- Descriptive negation:
  - “It was not hot on Sunday. It was warm.”
  = “It was less than hot”
  - “Mary does not have four cats. She has one.”
  = “Mary has less than four cats”

- Metalinguistic negation:
  - “It was not hot on Sunday. It was blazing hot.”
  = “It is not enough to say it was hot: it was more than hot”
  - “Mary does not have four cats. She has ten.”
  = “It is not enough to say Mary has four cats: she has ten”
3. Scalar implicature

• Traditional view: Gricean reasoning based mainly on the first submaxim of quantity (Grice 1975, Horn 1972, inter alia)
  • “Make your contribution as informative as is required (for the current purposes of the exchange”
  • If a speaker utters φ, but could equally well have uttered ψ, where ψ is more informative than φ, the hearer can infer that there was a reason for the speaker not to utter ψ
  • It’s not the case that the speaker thinks that ψ
  • If the speaker can be assumed to have an opinion, that is, to think that ψ or to think that not-ψ, then the speaker can be inferred to think that not-ψ
3. Scalar implicature

• Example:
  • \( \phi = \text{Mary ate some apples} \)
  • How do we understand some?
    • At least some: encoded meaning
    • Some but not all: strengthened meaning
3. Scalar implicature

- Example:
  - $\phi = $ Mary ate some apples
  - $\psi = $ Mary ate all apples

- $\psi$ is more informative than $\phi$: anytime $\psi$ is true, $\phi$ will necessarily be true as well, but the opposite does not hold
- We say $\psi$ entails $\phi$
3. Scalar implicature

• Example:
  • $\phi = \text{Mary ate some apples}$
  • $\psi = \text{Mary ate all apples}$

• SI:
  • The speaker uttered $\phi$
  • The speaker could have uttered the more informative $\psi$ instead but did not
  • Probably the speaker does not believe $\psi$ to be true
    • The strengthened meaning is the conjunction of $\phi$ with the negation of the more informative alternative $\psi$:
      • $\phi \land \neg \psi = \text{Mary ate some apples but not all of them}$
      • “Mary ate some apples and in fact she ate all of them”
    • Cancellability is a hallmark of implicatures
3. Scalar implicature

- Example:
  - $\phi = \text{Mary ate some apples}$
  - $\psi = \text{Mary ate all apples}$

- But:
  - $\psi' = \text{Mary ate some but not all of the apples}$
  - $\psi'$ entails $\phi$ too

- Negating both alternatives would lead to a contradiction
  - Mary ate some of the apples but not all of them but also not some but not all of them
  - This is called the symmetry problem (Kroch 1972, von Fintel and Heim 1997)

- The SI reasoning requires that the set of alternatives is restricted
  - Horn (1972): lexical scales
    - Criteria: monotonicity, complexity…
  - Katzir (2007): structural alternatives
3. Scalar implicature

- In sum: traditionally, scalar implicatures have been treated as conversational implicatures that
  - arise through reasoning about the speaker’s intentions based on a full utterance
  - require two additional assumptions in order not to undergenerate or overgenerate:
    - The opinionatedness assumption
    - Restriction on the set of alternatives
4. A grammatical account of SI

- Chierchia (2004) argues against a globalist view of SI and for a grammatical approach, where SIs are derived compositionally through **silent exhaustification**:
  - The strengthened meaning of $\phi = O(\phi)$, where $O$ is like silent *only*.
  - Exhaustification via $O$ takes the set of alternatives of $\phi$ and negates all alternatives that are not entailed by $\phi$.
    - With amendments to avoid the symmetry problem.
  - Exhaustification does not apply vacuously (if it does not lead to a logically stronger, more informative result).
    - $\phi = I \text{ doubt that Mary or John will come}$.
    - $\pi = I \text{ doubt that Mary and John will come}$.
    - $\phi$ entails $\pi$.
    - Therefore, $O(\phi)$ wrt. $\pi$ is vacuous; $O(\pi)$ wrt. $\phi$ is not, however!
      - In general, $O$ is vacuous in when applied to the stronger alternative.
      - The motonicity properties of the alternative determine which alternative entails which.
4. A grammatical account of SI

- **Downward entailing (DE)** or monotone decreasing contexts have the property of licensing subset inferences ≈ reversing the direction of entailment wrt. **upward entailing contexts (UE)**

1. “I ate *spaghetti*” entails “I ate *pasta*”
2. “I ate *pasta*” does not entail “I ate *spaghetti*”
3. “I did **not** eat *pasta*” entails “I did **not** eat *spaghetti*”
4. “I did **not** eat *spaghetti*” does not entail “I did **not** eat *pasta***

- **Negative** declaratives are DE, so the pattern of SIs is reversed wrt. the scalar expression:
  - Mary **or** John will come ≈ **not**(Mary **and** John will come)
  - It is **not** the case that Mary **and** John will come ≈ **not**(It is not the case that Mary **or** John will come = Neither Mary nor John will come)
4. A grammatical account of SI

- Chierchia’s argument is empirical
  - SIs can be embedded: they sometimes need to be derived not based on a full utterance, but a subpart of it
  - The silent exhaustification operator O needs to be inserted locally, so that it applies before another operator
4. A grammatical account of SI

- Hurford’s constraint (HC, Hurford 1974):
  “A sentence that contains a disjunctive phrase of the form S or S’ is infelicitous if S entails S’ or S’ entails S”
  - # “Mary ate an apple or a fruit”

- Scalar expressions violate HC
  - “Mary ate some or all of the apples”
  - “… all …” entails “… some …”

- Local exhaustification solves the problem
  - “… all …” does not entail “… only some …”
  - Does not help in cases where no relevant alternatives are available
5. Negation and SI

- Negation is DE: no SI arises when there are no stronger alternatives to negate.
- However, there are cases where negation in a stronger alternative gives rise to an interpretation that is not compatible with the logical meaning.
  - These examples can also be dealt with by positing that the silent exhaustification operator can be inserted in embedded positions.
  - “Mary did not eat an apple or a pear; she ate both”
    \[ = \textbf{not} ( \textit{only} ( \ldots \textbf{or} \ldots ) ) = \textit{not} O_{alt}(\text{Mary ate an apple or a pear}) \]
- Other examples:
  - “I don’t think some people will come; I think everyone will”
    \[ = \textbf{not} ( \textit{only} ( \ldots \textbf{some} \ldots ) ) = \textit{not} O_{alt}(\text{I think some people will come}) \]
  - “It was not hot; it was blazing hot”
    \[ = \textbf{not} ( \textit{only} ( \ldots \textbf{hot} \ldots ) ) = \textit{not} O_{alt}(\text{It was hot}) \]
- These are also used as examples of metalinguistic negation (Horn 1985, 1989), where negation is used by a speaker who wishes to object to the way an utterance was put.
  - “You cannot say that it was hot because it was more than that”
6. Conclusion

- The grammatical approach to SI might explain some cases of metalinguistic negation simply by positing a difference in scope
  - metalinguistic negation = negation that scopes over the exhaustification operator?
- For other cases, an exhaustification-based explanation seems unsuitable
  - /tɛ'meɪtəʊ/, /tɛ'maɪtəʊ/
  - “That is not my wife… because I have no wife”