Universität Bielefeld

SFB 673

Is too much information too much trouble?

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SFB 673 – Alignment in Communication

Workshop on Conversational Implicatures, Nijmegen, January 2012

(Partial) motivation

- Implicatures from numerically quantified expressions
  - e.g. “more than 80” +> “not more than 100”

A. This case holds CDs. How many do you have?
B. I have more than 80 CDs.

(Partial) motivation

- Implicatures from numerically quantified expressions
  - e.g. “more than 80” +> “not more than 100”

  attenuated *partially* by prior mention

A. This case holds **80** CDs. How many do you have?
B. I have more than 80 CDs.

Too much information?

"I used to be called…the Waco Kid"

"The Waco Kid? He had the fastest hands in the West"

"In the *world*"

(Brooks et al. 1974)

The QUD perspective

- Roberts (1996) – Question Under Discussion (QUD)
- "Complete answer" to a QUD
  - "contextually entails an evaluation for each element of [the Q-alternative set]"
  - e.g. *p* and *q* are propositions in the Q-alternative set; anything entailing (*p* & *q*) is a complete answer

- But "more than 100" entails "more than 80"…
- ….therefore should constitute a 'complete answer' whenever "more than 80" does, permitting implicature

The established objection

- Sperber and Wilson (1986) – over-informative utterances judged to be lower in relevance
- Potts (2006)
  - Uses Roberts's approach to determine how well a candidate proposition answers the QUD
  - Considers the least informative of the maximally good answers to be optimally felicitous
  - Adds the possibility of QUD-switching on the part of the speaker (cf. flouting maxim of relation)

QUD-switching

- Speaker can strike out and answer an 'unasked' question

e.g. A: Which country do you live in?
B: I live in New York. (Potts 2006)

- Switches of (apparent) QUD evident in usage
  - Can be signalled by 'by the way', 'incidentally', etc.
- Not predictable by interlocutor
- "Some indeterminacy" as to what the new question is (Potts 2006: 73), which hearer must resolve

Licensing QUD-switching

- Given that switches in QUD are theoretically possible but practically unhelpful (for various reasons):

  When is it actually acceptable for a speaker to switch QUD?

- Or, to ask a smaller question,

  When is it acceptable for a speaker to provide a more informative answer than the hearer requires?

Why be extra informative?

- Suppose *whether p* is the apparent QUD, and *q* entails *p*

- Cooperative interlocutor should make available maximal useful information at minimal effort
  - What information is useful?
  - How is effort measured? Whose effort is considered?
- Asserting *q* is favoured:
  i. If it provides additional 'relevant' information
  ii. If it is easier to assert than *p* (less effortful)
- Asserting *q* is disfavoured:
  - If additional effort is then required to recover *p*

(i) Additional 'relevant' information

- Suppose *whether p* is the apparent QUD, and *q* entails *p*

- Current QUD is a move in a dialogue game (Roberts)
  - Part of a stack of QUDs that need answers
  - Interlocutor might pre-empt other QUDs in the stack

  e.g. A: This apartment is 55m^2: is that big enough?

  B: No, I'd like at least 60m^2.

- Extra-informative responses should be acceptable if they answer other QUDs in the stack
  - Condition not strictly necessary in Roberts's or Potts's account
  - Similar story in Relevance Theory

(ii) Easier to assert stronger *q*

- Suppose *whether p* is the apparent QUD, and *q* entails *p*
- If *q* provides no additional useful information, and the hearer must do extra work to recover *p:*

  utterance of *q* should be prohibited (RT, perhaps Potts 2006)

- But consider
  - Redundant adjectival modification (Rubio Fernandez i.a.)
  - Precise time reporting (Van der Henst et al. 2002)
  - Indirect answers

(ii) Easier to assert stronger *q*

"Is he qualified?"

"He's a violent, bigoted, mindless old fool"

"Sounds a bit over-qualified"

(Curtis/Elton 1987)

(ii) Easier to assert stronger *q*

- Suppose *whether p* is the apparent QUD, and *q* entails *p*

- Statement of *q* possible as an answer to the QUD
- Justification in RT:
  - Consider the speaker's utterance to be optimal *subject to the speaker's own preferences and abilities* (Wilson and Sperber 2002)
  - If it is not possible for the speaker to answer the question directly under these conditions, asserting the stronger *q* should be fine
  - However, introduces a third undefined quantity (alongside hearer's effort and cognitive effects)

Balancing effort and effect

- Following Wilson and Sperber (2002), could consider balancing speaker effort, hearer effort and hearer effect

- Given some reason for the speaker to be over-informative, need to consider the effect on the hearer
  - How easily can the hearer recapture the information that (s)he is interested in, given the speaker's choice of utterance?
- This should in principle restrict the possible behaviour of the speaker (within the limits of cooperativity)

Inferences and their availability

- We do not draw all available inferences
  - e.g. mathematics (as a system of tautologies) follows from its axioms, but is not spontaneously inferred

- Some inferences (of those that are drawn) are more easily/naturally/automatically drawn than others
  - "Is Jane's uncle religious?"
    "He's the bishop of Padua"
  - "Is Jane's uncle married?"
    "He's the bishop of Padua"

Elaborate artificial example

"Is Fermat's Last Theorem true?"

No three positive integers a, b, c can satisfy $a^n + b^n = c^n$ for $n > 2$

"Yes"

"Andrew Wiles proved it in 1994"

"Andrew Wiles proved the Taniyama-Shimura conjecture for semistable elliptic curves in 1994"

Any elliptic curve over **Q** can be obtained by a rational map with integer coefficients from the classical modular curve $X_0(N)$ for some integer N

Unavailable inferences?

- Geurts et al. (2010):

  "at most two" does not entail "at most three"

  "three" does not reliably entail "at most three"

  "three" does not reliably entail "at least three"

  despite 'logical' expectations

- Possible corollary:
  If "whether 'at most three'" is the QUD, "at most two" does not answer it by the definition of Roberts (1996)
  - But c.f. "p" failing to entail "p or q"

Slow and fast inferences

- e.g. number size comparison
  - One digit numerals (or words) – comparison time proportional to log(distance) (Moyer and Landauer 1967 i.a.)
  - Two digit numerals – different means of comparison possible
    - Holistic comparison with distance effects (Dehaene et al. 1990), or effect of digit-by-digit comparison (Nuerk et al. 2001) depending on mode of presentation
  - Processing preference for round numbers (Dehaene 1997 i.a.)
  - General preference for coarse-grained representations (Krifka 2009 i.a., Solt et al. in prep.)

Interim summary

- Helpful and unhelpful ways to over-inform
  - Considerate speakers might be addressing other QUDs in stack
    - Or introducing new QUDs for reasons not explored here
  - Selfish speakers might be minimising their own effort at the expense of the hearer
    - Acceptability of this should relate to the inference patterns arising from the given utterance, and their associated costs
    - Over-informative utterances that 'easily' entail an answer to the QUD should be more felicitous (*ceteris paribus*)

Conditions for implicature

- General success of scalar implicature requires that the speaker chose not to make a stronger statement
- Must have been possible for the speaker to make a stronger statement, hence
  - There must exist an appropriate form of words conveying the stronger statement (e.g. Horn 1984)
  - The speaker must be knowledgeable as to the truth of the stronger statement
  - The stronger statement must be utterable without violating politeness considerations (e.g. Bonnefon et al. 2009)
  - The stronger statement must be relevant to the discourse purpose (e.g. Breheny et al. 2006)

‘Relevance’ and valid alternatives

i. When would the stronger proposition be relevant?
ii. When would a hearer consider that the stronger proposition might have been uttered?

- (i) might connect to QUD (as earlier)
  - Thus could derive QUD-based prediction about implicature availability
- (ii) might also connect to QUD
  - Reasonable only to consider alternative utterances that answer the existing QUD
  - (notwithstanding the possibility of QUD shift)

Linking these notions via reasoning

- Consider a Horn scale such as <some, most, all>
  - Entailments from strong to weak seem robust
  - SIs from weak to (negation of) strong also fairly robust
  - Strong connection between terms
- Suppose that the entailments are 'automatic'
  - Representing 'all' causes representation of 'some'
  - Basis for associative learning
  - Could establish (nearly as) strong connection the other way
- Scales could be collections of terms that are susceptible to this kind of 'automatic' inference

The case of numerical quantifiers

- "More than 80" implicates "not more than 100"
  - "More than 100" a valid answer to "whether more than 80" QUDs
  - Entailment from "more than 100" to "more than 80" plausibly rapid and easy (given roundness of numbers involved)
  - This could make "more than 100" a salient alternative

- "At least 5" implicates "possibly (exactly) 5"
  - "More than 5" perhaps a valid answer to "whether at least 5" QUDs
  - If so, the entailment ("more than" -> "at least") might give rise to the (weak) SI ("at least" +> "not (more than)")

Summary

- Plausible relation between reasoning preferences and the associations that might underpin implicatures
- Reasoning preferences are predicted to bear upon whether an utterance answers a QUD felicitously
  - Preferences not entirely obvious
  - Availability of inference under-determined by semantics alone
- This could result in the QUD-appropriate responses being considered as *privileged* 'alternatives' to the utterance
  - Thus, potential sources of implicature

Coda

- Zevakhina and Geurts (in prep.) – availability of implicatures from different triggers correlated with conscious awareness of stronger alternatives
  - This association could be connected to the activation of the weaker term by the stronger in everyday reasoning
  - Such an association would make the use of a stronger term relevant (as it would achieve 'cognitive effects')

e.g. if I hear "some" and wonder whether "all"…there's a case for addressing the stronger proposition (in relevance etc.)

If I hear "hot" and don't wonder whether "boiling", there's no obvious case for addressing the stronger proposition

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