Universität Bielefeld

SFB 673

# Speaker-referring pragmatics

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Universität Bielefeld, SFB 673: Alignment in Communication

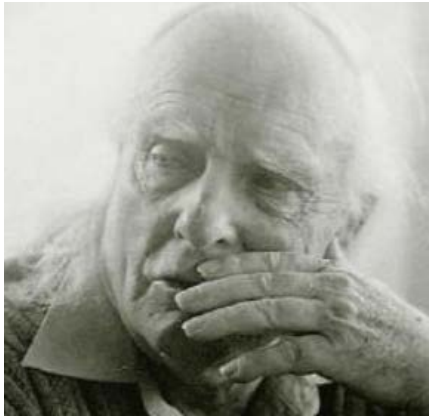
# Overview

- Theoretical and experimental semantics/pragmatics
  - focusing on implicature
  - especially quantity expressions and their implicatures
- Motivation for a speaker-referring pragmatic account
  - Outline of this for cases of numerical quantification
  - Experimental tests of its predictions
- Broader theoretical implications and prospects
  - Consequences for implicature
  - Extension to other domains, such as presupposition

# Quantity implicatures

- Additional information that is conveyed alongside the declarative content of an utterance
  - Usually to the effect that a related stronger statement would have been false
- Can be analysed as arising from flouting Grice's (1989) first submaxim of quantity:

> "*Make your contribution as informative as is required for the current purposes of the exchange*"



# Early (and prototypical) example

John Stuart Mill (1865: 442)

*"If I say to any one, 'I saw some of your children to-day', he might be justified in inferring that I did not see them all, not because the words mean it, but because, if I had seen them all, it is most likely that I should have said so: though even this cannot be presumed unless it is presupposed that I must have known whether the children I saw were all or not."*

# Why?

- Hearer could reason as follows
  - Speaker said "…some…"
  - Speaker could instead have said "…all…", which would have been more informative (entailing the existential "…some…")
  - Thus (*under some important assumptions*) the stronger statement with "…all…" must not be true

- Hence "some" **implicates** "not all":
  - It conveys the additional meaning in some way
  - The additional meaning is context-dependent
  - The additional meaning is coherently deniable by the speaker, etc.

# “Some” as a scalar term

- Idea: “some” +> “not all” is a **scalar implicature** (Horn 1972)
- <*some*, *all*> constitutes an informational scale, in that
  - its constituent terms differ in informational strength
  - they concern the same semantic area
  - they are equally lexicalised
- The declarative use of a weak scalar term tends to implicate the falsity of all stronger scalemates
  - “some” +> “not all”
  - “or” +> “not and”
  - “warm” +> “not hot”, etc. etc.

# The hearer's necessary assumptions

- Certain conditions have to met for the hearer's reasoning (two slides ago) to be logical
  - The speaker must be (presumed to be) knowledgeable about the stronger proposition (otherwise can only get a 'weak implicature')
  - There must be some reason why the speaker might have stated the stronger proposition
    - Uttering *p* does not normally implicate the falsity of just any alternative *q*, even though the speaker could have said "*p & q*"
    - The alternative has to be **relevant** (whatever that means…)
  - It must be possible for the speaker to make the stronger statement
    - The language must have the necessary resources
    - The stronger statement must have been socially permissible

# Hearers' flexibility

- Hearers apparently take all this into account, rapidly and online:
  - Breheny, Katsos & Williams (2006): Implicatures reduced when the stronger alternative is irrelevant
  - Bonnefon, Feeney & Villejoubert (2009): Implicatures reduced when the stronger alternative is face-threatening
  - Antoniou, Cummins & Katsos (under review): Implicatures reduced when the speaker is presumed ignorant of the stronger statement
- Useful for communication; tricky if we're interested in the 'preferred/default interpretations' of scalar terms

# Shifting focus to the speaker

- Hearer should (and do) recover implicatures iff the speaker intends to convey them
  - Fundamental to communication, if we construe this as involving alignment of situation models
- Thus it could make sense to look at the speaker too
  - Why is a particular expression selected?
  - What are the pragmatic consequences of that choice?
- This contrasts with most experimental work in the area
  - Focusing on interpretation of artificially-constructed stimuli
  - Excellent control but debatable naturalness

# Numerically-quantified expressions

- Expressions containing “more than 100”, “at least 3”, “not more than 10”, and so on
- Traditionally assumed to have the obvious mathematical semantics (e.g. “>100”, “≥3”, “≤10”, etc.)
- If so, rich entailment relations: many options for a speaker
  - e.g. if “more than 50” is true, so is “more than 49/48/47…”
- Non-trivial choice to be made
  - Most informative option is not necessarily chosen: can say e.g. “Edinburgh has more than 800,000 inhabitants”
  - Yet some options are distinctly odd, e.g. “Edinburgh has more than 1000 inhabitants”

# Accounting for this anomaly

- That oddness could be explained semantically
  - "more than 1000" could mean a restricted range, say 1000-10,000
- Problems
  - Sentence seems to be true, if we're forced to choose
  - Placed in the antecedent of a conditional, the consequent would have to be true
  - Under special contextual conditions, the sentence would be fine
- Nevertheless, that sentence can't generally be asserted felicitously, while it could with "more than 800,000"
  - What is 'too weak' to be felicitously asserted?

# Pragmatic option: constraints

- I propose to treat the speaker's task as solving a problem of multiple constraint satisfaction
- Speaker's general objective assumed to be to convey maximal information with minimal effort
  - Trade-off needed between conflicting requirements
  - Can be treated within a constraint-based framework such as Optimality Theory (OT), if we can spell out the contributory factors to "information" and "effort"
  - OT systems generate the optimal output given an input and a ranked set of (violable) constraints

# Which constraints?

- Functional motivations for the following:
  - Informativeness (INFO)
  - Numeral salience (NSAL)
  - Granularity (GRAN)
  - Quantifier simplicity (QSIMP)
  - Numeral priming (NPRI)
  - Quantifier priming (QPRI)
- System permits the integration of constraints from various different research areas

# Relation to Relevance Theory

- Broadly compatible with Relevance Theory, but aims to make more precise predictions
- Note that RT supposes
  - Utterances can be presumed optimal
  - This is defined in terms of the ratio of effect to effort
  - Limitations in the speaker's resources may result in utterances that are not strictly optimal in this sense
- This seems reasonable in outline
  - but we need to unpack the notions of effect, effort and speaker resources in order to make predictions about outputs

# Potential of the model

- Can provide a (hopefully well-founded) pragmatic account of phenomena that have been approached semantically
  - e.g. superlative versus comparative quantifiers
- Can generate novel predictions about classes of pragmatic enrichment that have been overlooked
  - e.g. inferences from “more than n”, and their interface with priming effects

# #1: Superlative quantifiers

- "at most", "at least"
- Classically treated as equivalent to operators ≤, ≥
- On cardinals, should therefore be interdefinable with comparative quantifiers:
  - "…at most 3…" true iff "…fewer than 4…" true
  - "…at least 3…" true iff "…more than 2…" true
- However, there are differences (Geurts and Nouwen 2007)
  - "…at most 2…" not judged to entail "…at most 3…" (whereas this works with "…fewer than 3…" and "…fewer than 4…")
  - Various distributional differences, e.g.
    "…at most 3/*fewer than 4 people, namely Tom, Dick and Harry"

# #1: Superlative quantifiers

- Semantic account (G&N): superlative quantifiers also possess a modal component to their semantics
  - "At most 3" ≃ "certainly no more than 3, and possibly exactly 3"
- Pragmatic account (Cummins and Katsos 2010)
  - Compare "at most 3" and "fewer than 3"
  - "fewer than 3" is more informative and the quantifier can be assumed to be no more complex (based on frequency etc.)
  - "fewer than 3" harmonically bounds "at most 3", in OT terms
  - Speaker-referring model thus suggests that "at most 3" should occur only when speaker cannot affirm "fewer than 3"
  - Hence can obtain an implicature from "at most 3" that "exactly 3" must be possible, from the speaker's point of view

# #1: Superlative quantifiers

- The constraint-based account thus recaptures the proposed modal meaning, but does so pragmatically
- Advantages:
  - Arguably less stipulative
  - Neatly captures the fact that the modal meaning sometimes doesn't seem to surface (as G&N acknowledged), e.g.:

    *"If you have had at most 2 drinks, you are fit to drive"*

# #2: Inferences from comparative quantifiers

- Expressions of the form “more than n” argued not to enter into informational scales (Fox and Hackl 2006)
- Why not? Suppose they did, then
  - <*more than 4*, *more than 5*> would be part of a scale
  - “more than 4” would implicate “not more than 5”…
  - …and together these would entail “exactly 5” (for cardinalities)
  - But “more than 4” does not seem to convey “exactly 5”, so this kind of scalar implicature must be absent
- But if there’s no implicature, why is “Edinburgh has more than 1000 inhabitants” so anomalous?

# #2: Inferences from comparative quantifiers

- Competing prediction: “more than n” does give an implicature, but not the obvious one:
  - “more than 70” implicates “not more than 80”
- Idea: “more than 71” is more informative than “more than 70”, but it violates numeral salience (NSAL)
  - Round numbers widely agreed to be easier to process
  - Assertion of “more than 70” might just mean that the speaker chose the ‘low-effort’ option
  - However, “more than 80” would be just as good in terms of NSAL, as well as more informative
  - Hence, “more than 70” should implicate “not more than 80”, and in general implicatures about the next round number should work

# #2: Inferences from comparative quantifiers

- Tested in Cummins, Sauerland and Solt (2012)
  - Preferred interpretations elicited for quantity expressions

Information:

A newspaper reported the following.

"[Numerical expression] people attended the public meeting about the new highway construction project."

Question:

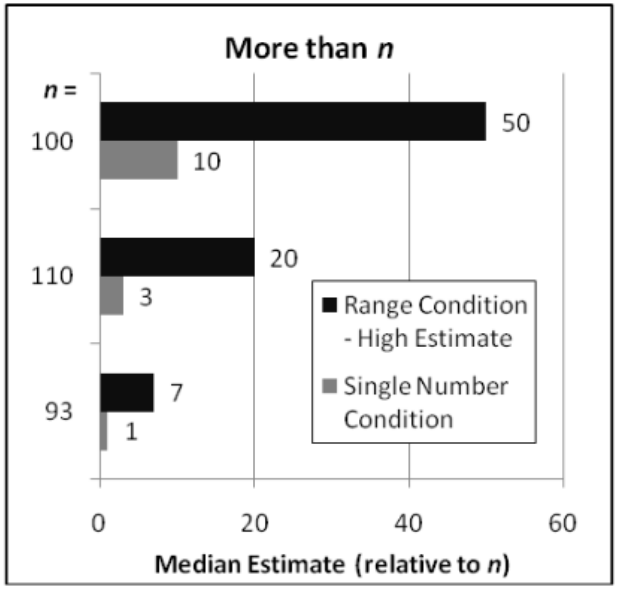
Based on reading this, how many people do you think attended the meeting?

Between _____ and _____ people attended.

_____ people attended.

# #2: Inferences from comparative quantifiers

- Tested in Cummins, Sauerland and Solt (2012)
  - Preferred interpretations elicited for quantity expressions
  - Evidence of pragmatic upper bounds
    - Some participants explicitly reported that they assumed that a stronger statement would have been used if it were true




Fielded on MTurk, n=100 per condition (separate days)

# #2b: Effect of priming

- Constraint-based model predicts weaker implicatures in the case of numeral reuse
  - Consider e.g. “more than 70” where 70 already occurs in the preceding context
  - Why does speaker use this instead of a stronger expression?
    - Could be because the stronger expression is not true
    - Could be because “more than 70” conforms with the numeral priming constraint
    - In the latter case, no implicature should be available
  - Hence, reused numerals should yield less robust implicatures
    - cf. “Edinburgh has more than 1000 inhabitants”
    - Also borne out by Cummins, Sauerland and Solt (2012)

# Summary and prospects

- A speaker-referring constraint-based account appears to have some explanatory and predictive value
  - It offers a novel pragmatic account of some observed phenomena
  - It enables new predictions about pragmatic enrichments to be drawn
- Potential to extend this in theoretically and practically useful ways
  - Exploring priming
  - Handling presuppositions
  - Attempting to generalise to other usage domains

# Priming and implicature

- Model assumes form-based priming effects
- However, experimental results could be attributable to higher-level concepts such as Question Under Discussion

  *We need to sell n tickets to break even.*
  *We've already sold more than n tickets.*

- So, does the reuse of a number affect the implicatures even if the prior mention was somehow irrelevant?
- May be an interesting question either way:
  - If 'yes', evidence that pure priming effects have effect on implicature
  - If 'no', suggests that priming effects may lead to imperfect communication at a pragmatic level

# Presupposition projection

- Active research question in sem/prag: how do we explain the variable projection behaviour of presuppositions?
- Contrast

  *John didn't find out that Clare was ill* with
  *John didn't find out that Clare was ill, because she wasn't*
- Presupposition triggers such as 'find out' can introduce new information, but sometimes that's suppressed
- Again we can ask: why does the speaker use a trigger?
  - If there's a contextual justification, such as priming, we should expect the presupposition not to project to the discourse level
  - If not, it should project
  - Can we model the speaker's choice in a similar fashion?

# Other domains?

- Numeral-referring constraints are domain-specific, but the underlying idea is more general
- The approach captures the idea that
  - hearers are good at computing the speaker's intended meaning
  - they do this by distinguishing what is intentional from what is unintentional, as far as the speaker is concerned
  - so if hearers are sufficiently adept, we can study meaning by focusing on the speaker
- Widening the scope of the model is problematic, but
  - might shed light on 'metalinguistic negation' and similar effects
  - might open up new perspectives on pragmatic enrichment

# Thank you!

## References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