Can priming account for implicature failure?

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Project A3: Dialogue and Group Dynamics

Summary

- Priming alone does not account for the attenuation of certain implicatures
- This is not entirely obvious given the data

References

- Bonnefon, J.-F., Feeney, A. and Villejoubert, G. (2009). When some is actually all: Scalar implicatures in face-threatening contexts. *Cognition*, 112: 249-58.

- Breheny, R., Katsos, N. and Williams, J. (2006). Are scalar implicatures generated by default? *Cognition*, 100(3), 434-63.

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- Grice, H. P. (1975). Logic and Conversation. In P. Cole and J.L. Morgan (eds.), *Syntax and Semantics*, Vol. 3. New York: Academic Press. 41-58.

- Horn, L. R. (1985). Metalinguistic negation and pragmatic ambiguity. *Language*, 61(1): 121-74.

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Outline

- (Quantity) implicature
  - Its licensing conditions
  - What happens if the conditions are not met
  - Examples in the numerical domain
- Priming
  - As a potential cause of implicature failure
  - New(ish) data from expressions of number
  - Exploring the possibilities of this account

Implicature

- Pragmatic enrichment
- Arises from speaker's choice of words
- Cancellable

Early example

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

John Stuart Mill,
An Examination of Sir William Hamilton's Philosophy…, 1865

Grice's CP and maxims

- Cooperative Principle:

"Make your contribution such as it is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged."

- Maxims of
  - Quality
  - Quantity
  - Relation
  - Manner

Purpose of the maxims

- Not prescriptive
- Encode expectations about rational conversation
  - Hence flouting leads to reparatory inferences
  - Types of inference depend on maxim flouted

Quantity implicatures

- ## Arise from flouting Quantity (I) maxim
  "Make your contribution as informative as required (for the current purposes of the exchange)"

- ## Example: scalar implicatures
  – Use of weaker term in scale implicates falsity of stronger
    - <some, all>
    - <or, and>   } *Horn scales*
   - <a, the>

Nature of scalar implicatures

- Context-dependent?
  - Reliable
  - Slow (?)
  - Coherent with other pragmatic inferences

- Or automatic?
  - Potentially unreliable
  - Fast
  - Distinct from (all?) other pragmatic inferences

Nevertheless…

- Whatever the mechanism, **outcome** is 'Gricean'
- Failure of licensing conditions -> SI not (ultimately) obtained
  - Examples:
    - Incomplete knowledge (cf. Mill)
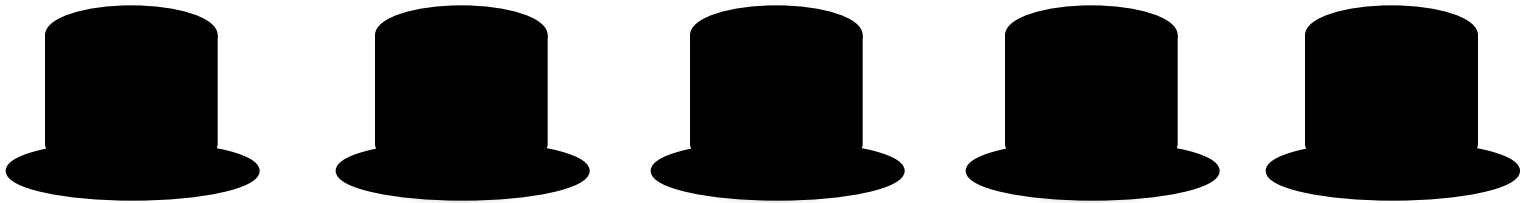   - Irrelevance of stronger proposition
    - Politeness

Incomplete knowledge

- e.g. Katsos et al. (in prep.)
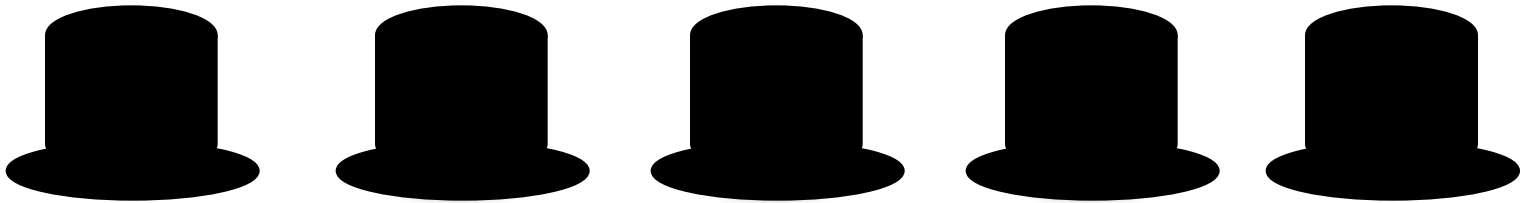
Incomplete knowledge

- e.g. Katsos et al. (in prep.)

Irrelevance of stronger proposition

- e.g. Breheny et al. (2006), *<or, and>* scale

- Upper-bound context – SIs apparently generated

    "Who will give the lecture?"
        "Bill or Ted from the department"

- Lower-bound context – fewer SIs

    "Who is available to give the lecture?"
        "Bill or Ted from the department"

Politeness

- Bonnefon, Feeney and Villejoubert (2009)
- SIs blocked if stronger statement would be face-threatening

    "What impression did I make at dinner?"

    "Some people thought you drank too much."

    "Some people liked/hated your poem"

Rational (Gricean) results

- Inference is not drawn if the stronger statement could not be made because
  - Speaker not sufficiently informed
  - Stronger statement irrelevant to discourse purpose
  - Stronger statement impolite
- All in the spirit of the Gricean approach

Inferences with number expressions

- "more than *n*", "fewer than *n*" seem exempt from Horn scales (Fox and Hackl 2006)

  "John has more than three children"
  !+> "John has not more than four children"

- Why?

  – "Linguistic" answer: semantics of expressions

Linguistics vs. psychology of number

- Linguistics:
  - All integers should have similar types of meaning
    - Require inductive definition (e.g. Peano axioms) to make sense of infinite number line with finite experience
    - Therefore expect any integer to be essentially representative (e.g. Geurts 2006, Bultinck 2005)

Linguistics vs. psychology of number

- Psychology of number:
  - Integers vary widely in salience
    - Subitizable numbers should behave differently
    - Small and round numbers occur more frequently than large and non-round numbers (Jansen and Pollmann 2001)
    - Round numbers may correspond to scale points of an approximate number system (Dehaene 1997)

New prediction for 'more than'

- "More than n" should implicate (under usual conditions) falsity of "more than m" for any m s.t.
  - $m > n$
  - m is at least as salient as n

- e.g. "more than 100"

  !+> "not more than 101" but

  +> "not more than 1000/200/150…"

Verification

Cummins, Sauerland and Solt (submitted)

Information: A newspaper reported the following.

"[Numerical expression] people attended the public meeting about the new highway construction project."
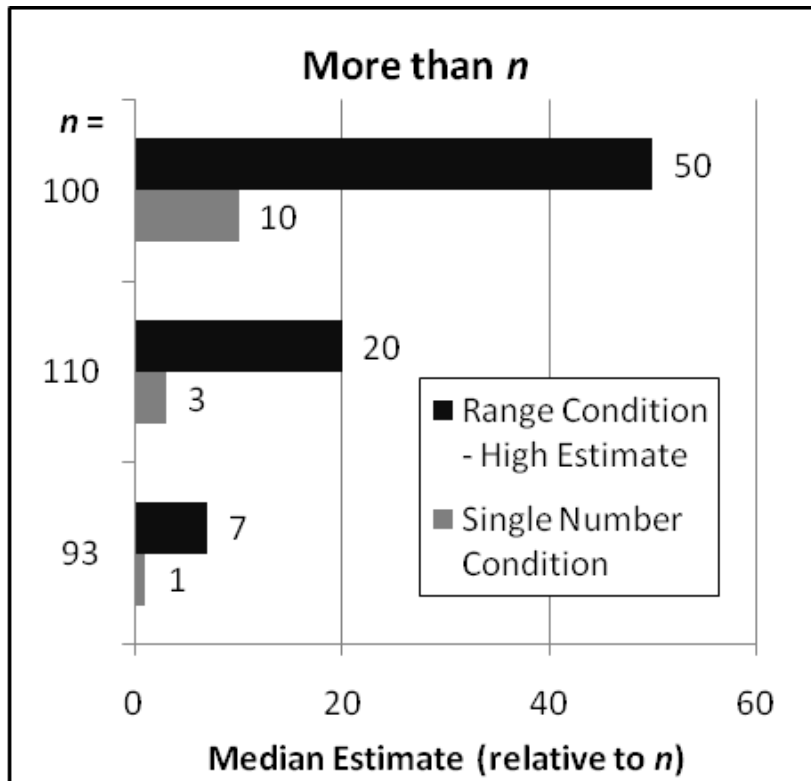
Question: Based on reading this, how many people do you think attended the meeting?

Between _____ and _____ people attended [range condition]

_____ people attended [single number condition].

Fielded (first) on MTurk: 6 conditions (2 prompts x 3 roundness levels)
100 participants per condition

Verification

Cummins, Sauerland and Solt (submitted)

ANOVAs show significant effects of roundness to both range and single number prompts ($p < 0.05$)

Comments reflect explicit awareness of this reasoning

(Post-)Gricean explanation

- Equal salience as numeral equivalent of Horn's 'equal lexicalisation'

- Non-round numerals behave like obscure or prolix expressions
  - Less accessible
  - More effortful to use
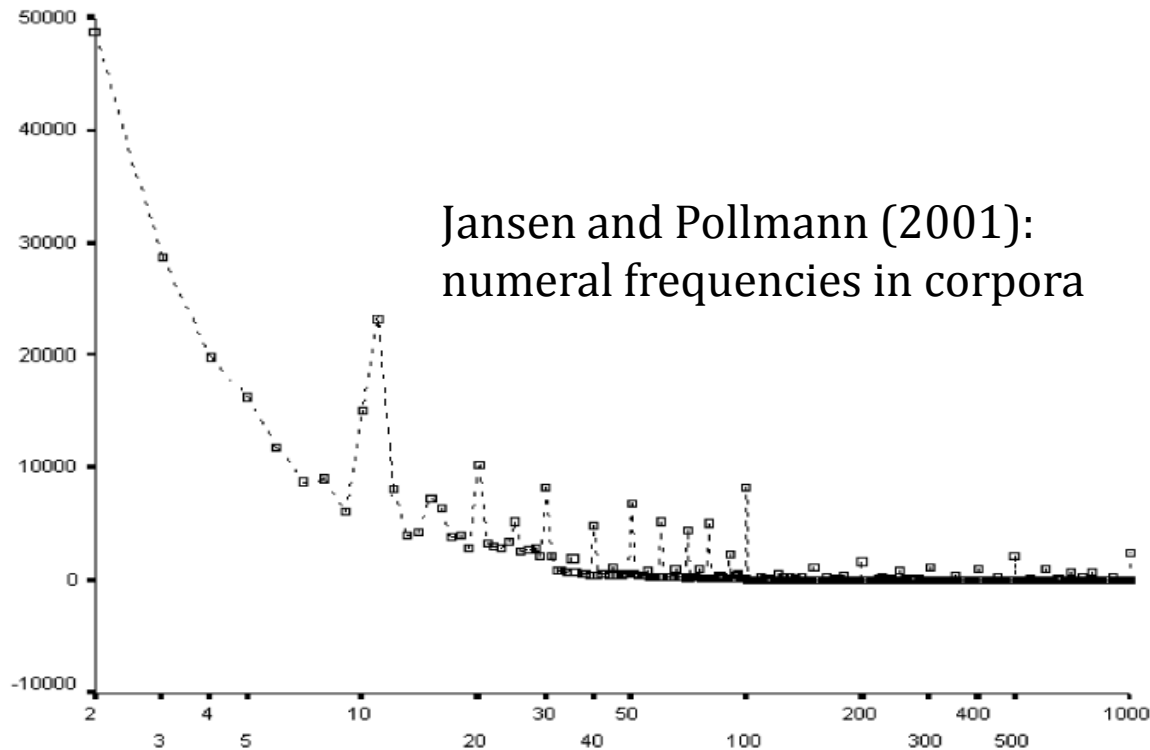 - More work to interpret

Priming vs. salience

- General landscape of numeral salience...

Jansen and Pollmann (2001):
numeral frequencies in corpora
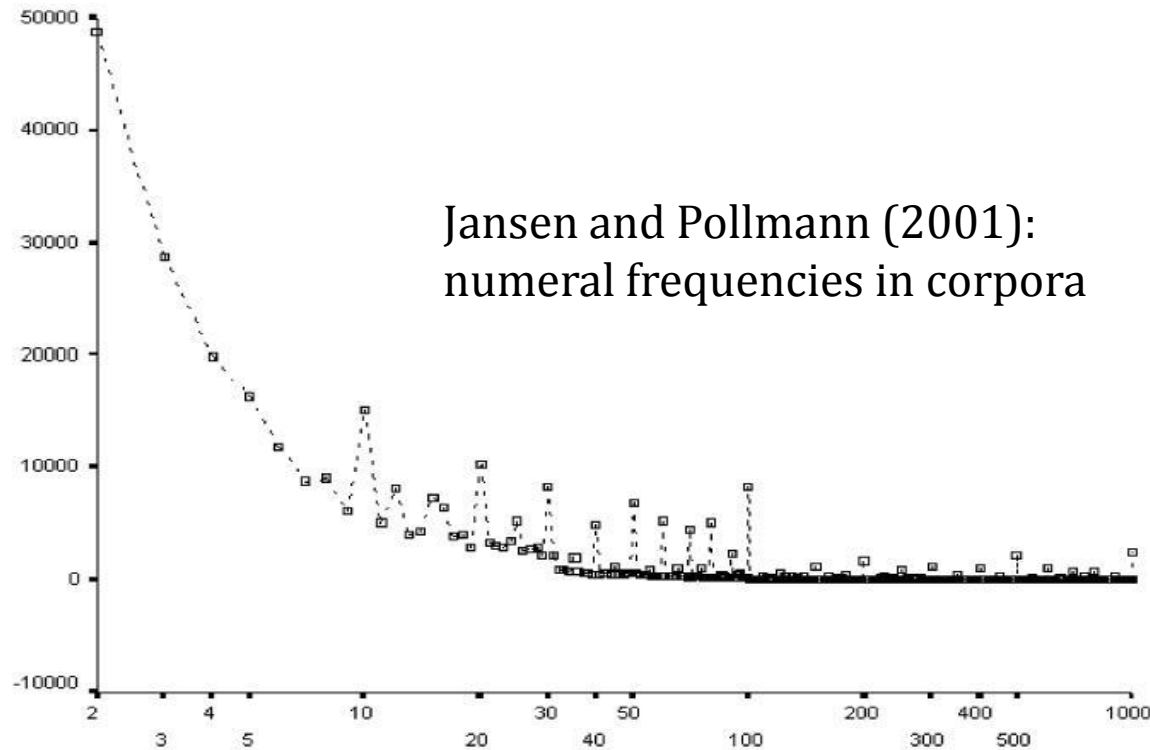
Priming vs. salience

- ...liable to be manipulated by priming effects

Jansen and Pollmann (2001):
numeral frequencies in corpora

Priming vs. implicature

- Hearer able to take into account possible obstacles to stronger statement being made
  - its impoliteness
  - its irrelevance
  - it being beyond the speaker's knowledge

  and thus refrain from inferring its falsity

- How should a hearer treat a primed numeral?

Priming vs. implicature

- Suppose n is primed by prior mention, then:

    S: ...more than n...

- Hearer should reason as follows
    - S could have said "more than m"
      [for some $m > n$ matched in general salience]
    - However, n is primed and therefore more available than usual
    - Perhaps S said "more than n" in order to reuse the primed numeral...
    - ...and **not** because "more than m" does not hold

Priming vs. implicature

- Prediction:
  priming numeral results in weaker bounds, i.e.
  - "more than n" could refer to a larger value
  - "fewer than n" could refer to a smaller value

  than in the unprimed case

Verification

Cummins, Sauerland and Solt (submitted)

Please read the following short dialogues, and answer the questions by filling in a value for each blank space, according to your opinion. Consider each dialogue separately. Assume that participant B is well-informed, telling the truth, and being co-operative in each case.

A: We need to sell (60) tickets to cover our costs. How are the ticket sales going?
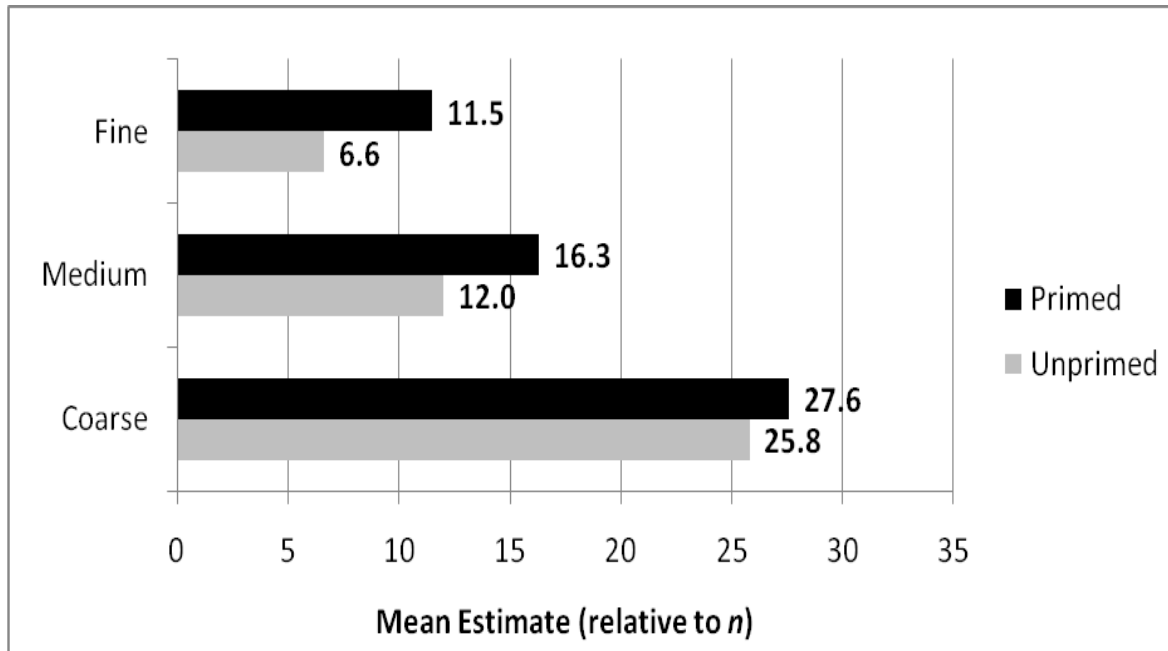
B: So far, we've sold more than 60 tickets.

How many tickets have been sold? From …… to ……, most likely …….

40 participants, paper questionnaire, 12 conditions:
quantifier (2) by priming (2) by roundness (3)

Verification

Cummins, Sauerland and Solt (submitted)

2x3x2 ANOVA shows main effects of
quantifier $(F(1,41)= 8.66, p<0.01)$
roundness $(F(2,80)=44.83, p<0.001)$
priming $(F(1,40)=10.78, p<0.01)$

Follow-up

Cummins, Sauerland and Solt (submitted)

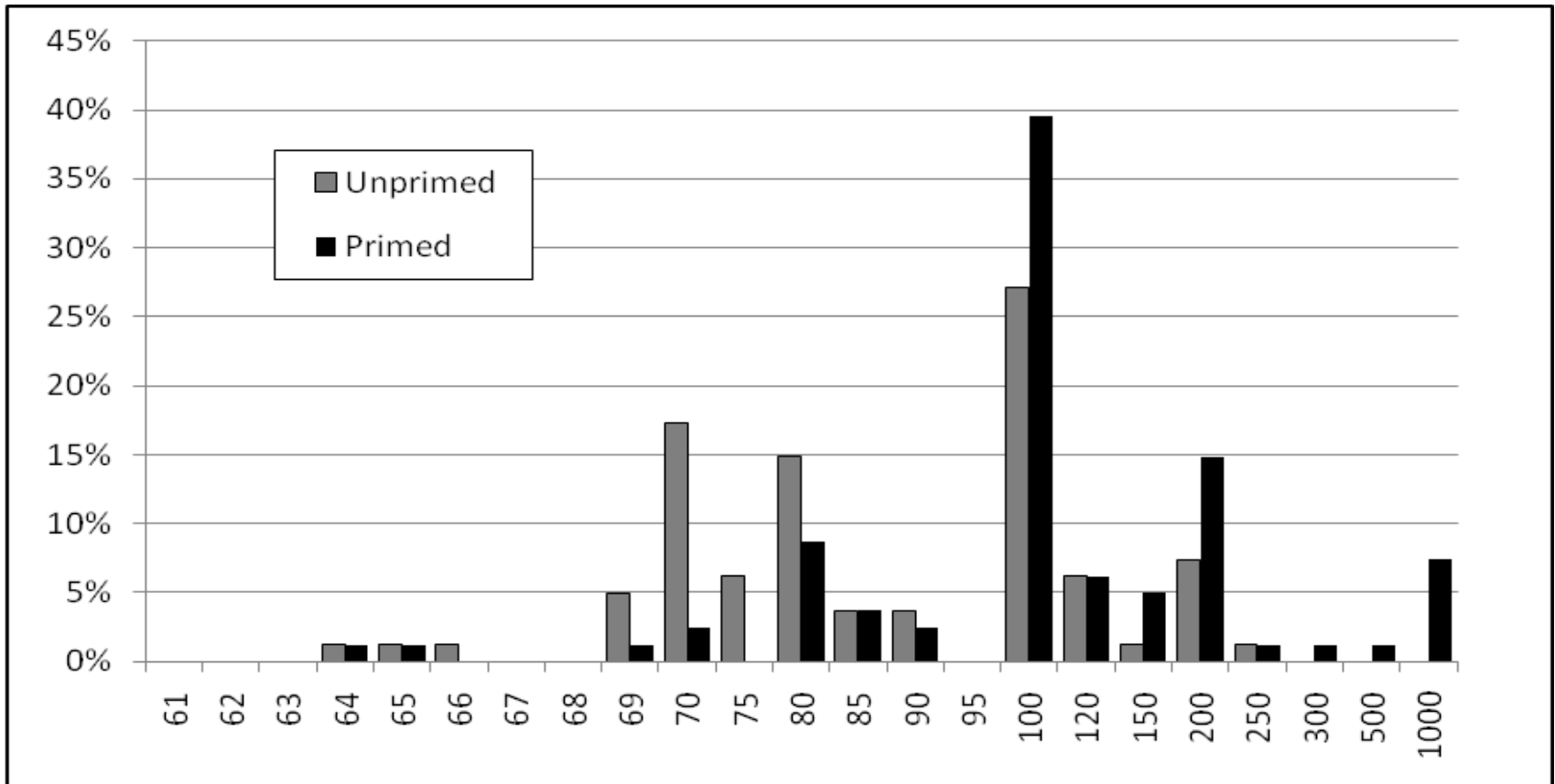Salesman: This storage unit holds (60) CDs. How many CDs do you own?
Customer: I have more/fewer than 60 CDs.

How many CDs does the customer have? From …… to ……, most likely …….

MTurk, 100 participants per condition
Removing semantically false answers left 336 data points (84%)

Follow-up results (upper bound)

Primed responses more distant than unprimed (Mann-Whitney U, p < 0.001)

Objections to this interpretation

- Weak priming effects
  - Overlapping results
  - Same implicatures frequently obtained despite priming
- Effects not due to low-level priming
  - Question Under Discussion (QUD) creates threshold value
  - Answers understood with reference to this
  - Note, however, that a stronger statement would still entail the answer to the QUD…

Reanalysis of follow-up

Salesman: This storage unit holds (60) CDs. How many CDs do you own?

Customer: I have more/fewer than 60 CDs.

- Customer is informed about topic

- Reuse of numeral might reflect low-level priming or awareness of QUD ('is this unit OK?')

- However, utterance is still likely to be vaguely indicative of quantity
  - cf. "Does Bielefeld have more than 1000 inhabitants?"

All QUD, no priming?

- Perhaps…

- …but from first principles, priming should exert some effect
  - 'Marked' expression might become 'unmarked'
  - Use of such an expression might no longer involve (e.g.) flouting Gricean maxim
  - Hence implicature blocked for rational hearer

Separating QUD and priming?

Cummins and Katsos (submitted)
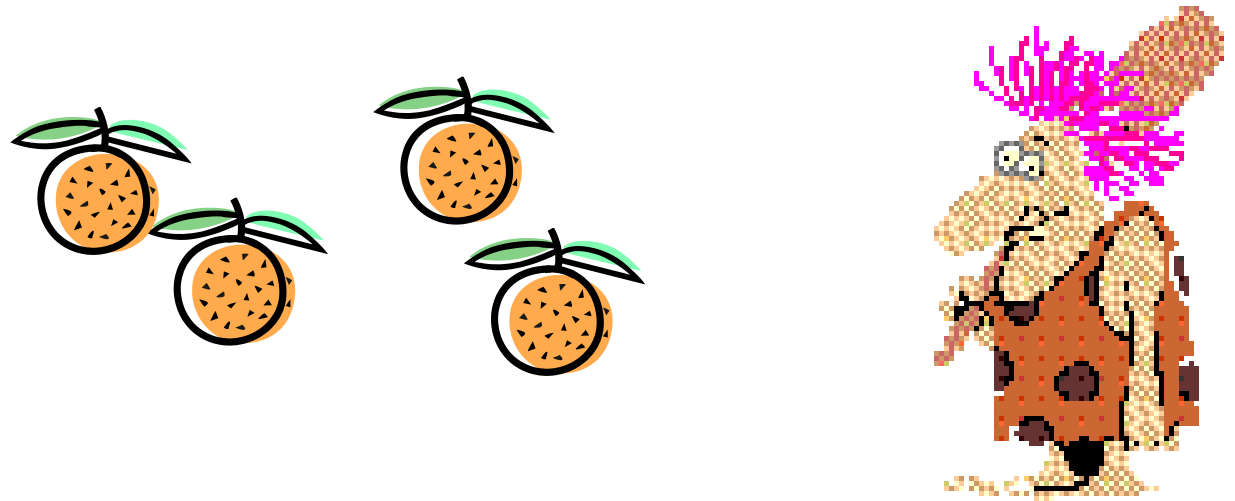
Priming effects in this experiment

- Utterance conditions response, e.g.
  - "most" attracts "most…not" corrections
  - "some…not" attracts "all…not" corrections
    (where these are semantically appropriate)
- QUD notionally fixed ("how many of the boxes have a toy?")
  - Could argue that Cavemom's utterance determines actual QUD…
  - …but unrelated descriptions would still serve as felicitous corrections to it

Separating QUD and priming

- Applied to the numeral implicature case:
  - Priming account predicts any prior mention of the numeral should attenuate implicature
  - QUD account predicts that only a numeral relevant to the QUD should do so
  - Readily testable

Other possible priming effects

- Presupposition accommodation
- Metalinguistic negation
  - (and related phenomena)

Presupposition accommodation

- Presupposition triggers, e.g. *realise,* can force accommodation of their arguments

   "I realised/didn't realise that Jim was lying"

- However, these ps. can sometimes disappear

   "Mary didn't realise that whales are fish because whales are not fish"

- Analyses focus on the hearer

- But why is the speaker able to use a trigger?

   – Idea: priming licenses its use

Metalinguistic negation

- Horn (1985): negation as an objection to something other than the utterance's semantics

  "Grandma isn't feeling lousy, she is indisposed"

  "Anne didn't manage to win the race, she dominated it"

- Generally, want to explain how the semantic meaning survives negation

"...repeated tonelessly..."

- Less-discussed 'dual' (?) of MN

  A: We should go to the museum.

  B: We should go to the museum.

- Flat intonation appears to distance speaker from semantics of (partially) repeated utterance
  - Alignment at one level, anti-alignment at another?

Priming in MN?

- Reuse of material seems to provide opportunity for non-expression of its semantics
  - MN: denial does not contradict
  - Other case: repetition does not endorse
- Potential explanation in priming?
  - Utterance licensed by its availability
  - Interlocutor knows this and interprets accordingly
  - (cf. solicited vs. unsolicited feedback)

Summary

- Experimental data supports hypothesis of low-level priming affecting pragmatics

- However, this could alternatively be attributed to higher-level effects

- Future work can distinguish these claims

- Possibility of extending similar analysis to other questions in pragmatics

References

- Bonnefon, J.-F., Feeney, A. and Villejoubert, G. (2009). When some is actually all: Scalar implicatures in face-threatening contexts. *Cognition*, 112: 249-58.

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