Modelling the pragmatic effects of approximation

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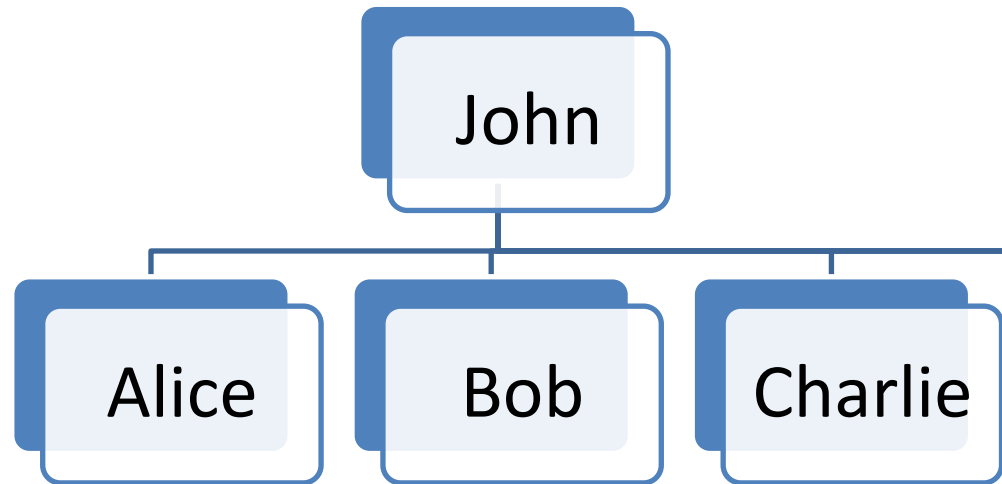
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Vague quantifiers?

- "More than"
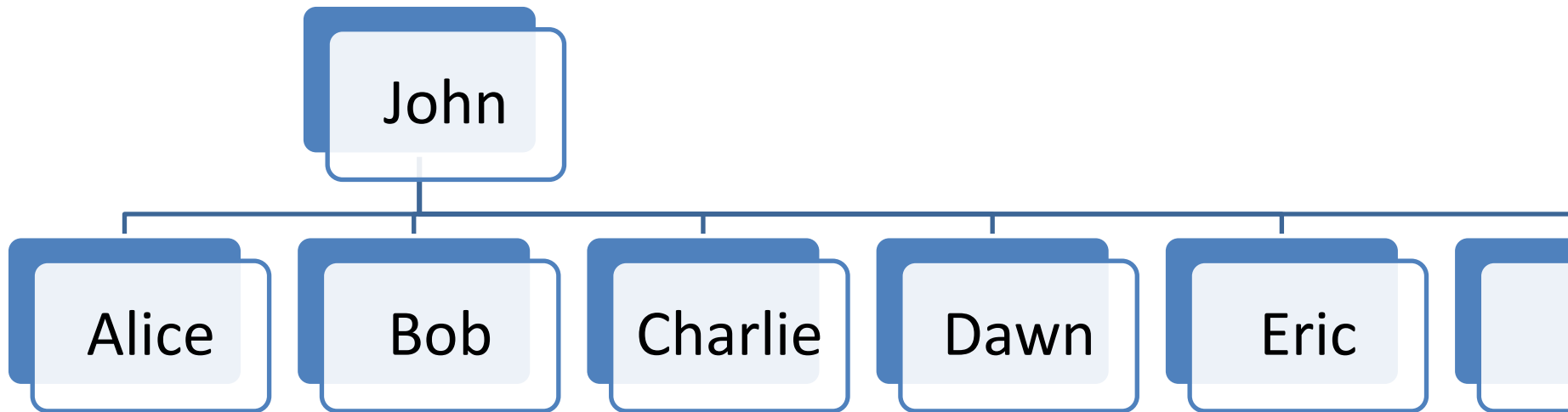
- "Fewer than"

- "At least"

- "At most"

Vague quantities

- "John has more than three children"

Vague quantities

- "John has more than three children"

Enriched meaning?

- "More than 50 people…"

  "…live in my apartment block"

  "…live in Berlin"

  Implicature: "more than 50" =>
     not more than x, for some x > 50

But: no implicatures of this type

- "John has more than three children"
  - SI because speaker did not say "John has more than four children"
  - "John has more than three children" => "It is not the case that John has more than four children"
  - => "John has more than three and not more than four children"
  - => "John has exactly four children"
- SI not conveyed (Geurts et al. 2010)

Exception: Granularity effects

- "Berlin has more than 50 inhabitants"
  - SI because speaker did not say "Berlin has more than 51 inhabitants"…
  - …DOES NOT ARISE because "51" less efficient expression than "50"

Exception: Granularity effects

- "Berlin has more than 50 inhabitants"
  - Respecting granularity, speaker could have said "Berlin has more than 60/100 inhabitants"
  - but could not have said "Berlin has more than 51/52/53 inhabitants", etc.
  - hence => "It is not the case that Berlin has more than 60/100 inhabitants"

Experiment:
SIs with modified numerals
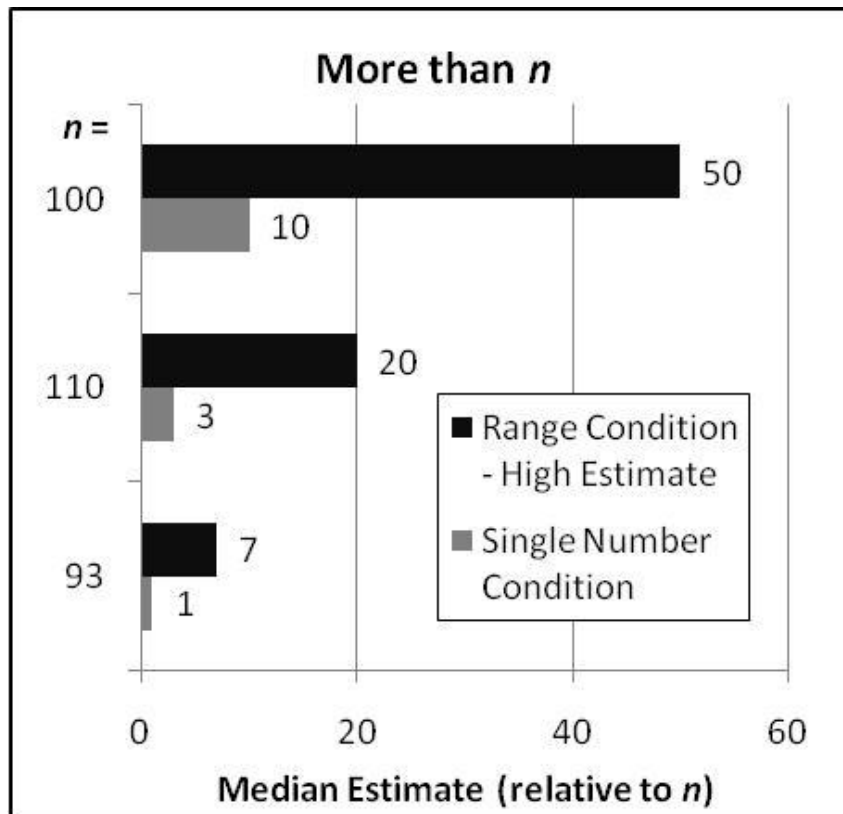
Information: A newspaper reported the following.

"[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].

Experiment:
SIs with modified numerals

Significant effects of condition (roundness) for both upper-bound and preferred single number (ANOVAs, p < 0.01).

Attenuation of SIs with modified numerals

- "More than 50" seems to implicate upper-bound...
- ...but what if you have some particular reason to be talking about 50?

"We need to sell 50 tickets to break even"

"We'll sell more/fewer than 50"

- Pragmatically, argument for implicature *fails*.

Experiment:
Attenuation of SIs with…

- 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 tickets to cover our costs. How are the ticket sales going?

- B: So far, we've sold fewer than 60 tickets.

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

Experiment:
Attenuation of SIs with…

- 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?

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

Experiment:
Attenuation of SIs with…
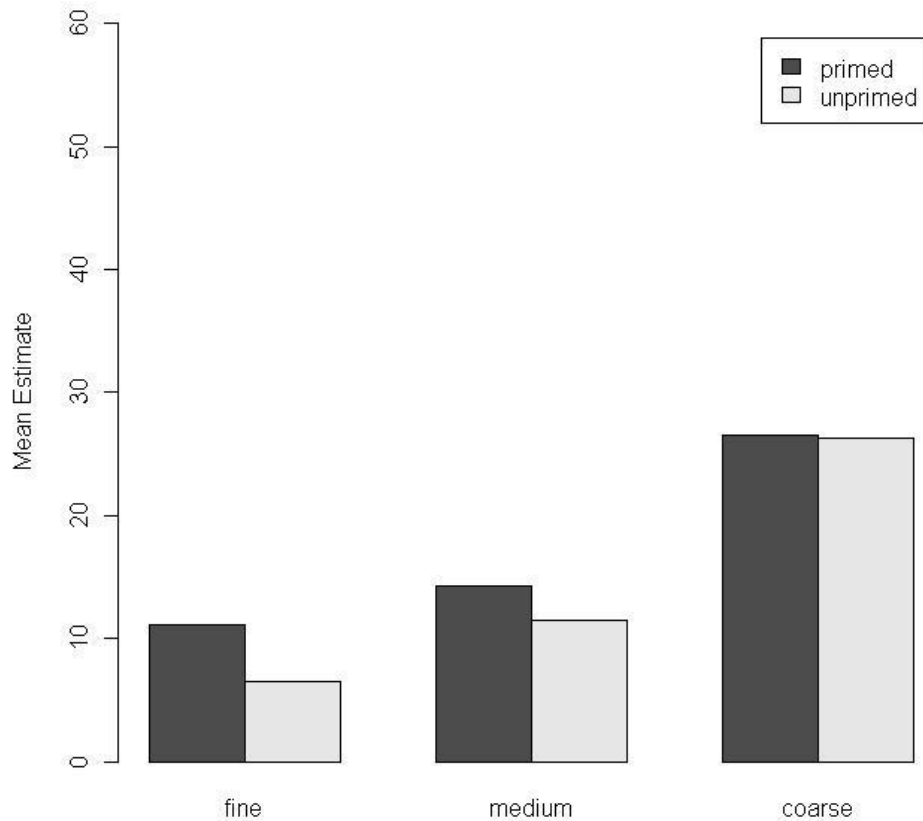
Significant effects of condition (roundness) (ANOVAs, p < 0.01); marginally significant effect of priming (p = 0.069).

Follow-up with MTurk shows significant priming effect.

Underlying proposal

- Choice of quantifier construed as output of multiple constraint satisfaction problem.

- Constraints:
  - Informativeness
  - Use of salient numeral
  - Priming (numeral and quantifier)
  - Use of appropriate granularity level
  - ...

Underlying intuition

- SIs arise from what you chose not to say
- No* choice – no* inference

- Extent to which you draw inferences should be proportional to the extent to which you think the speaker had a choice.
- If the choice is forced, e.g. by the need to talk about a certain number, then there are no grounds for inference.

Properly vague quantifiers

- Explicit approximation –
    - "about", "around", "approximately", vs. "exactly", etc.
- as accounted for by this intuition / this model

Constraints on approximation

- Explicit approximation violates constraint on economy of expression
  - "about 50" vs. "50"
- Tacit approximation violates constraint on informativeness
  - Assuming that the bare numeral is ambiguous between precise and approximative readings
- Relative ranking of constraints posited to predict choice (simplicity vs. informativeness)

Constraints on approximation

- Explicit approximation violates constraint on economy of expression
  - "about 47" vs. "47"
- Tacit approximation violates truthfulness
  - Assumption of ambiguity fails
- Other candidates "about 50", "50", etc.
 - Informativeness, simplicity, numeral salience predicted to conflict

Exception: prior activation

- Previous argument suggests that "about 47" wins over "about 50" only for certain distributions
  - Pragmatic enrichments follow
- Prior mention of "47" enables "about 47" to be favoured anyway
  - Pragmatic enrichments fail

- Potential to use "about 47" to refer even to "exactly 49", say
  - Numeral salience/priming versus informativeness

Pragmatic effects of approximation

- Use of approximation => speaker does not have better information
  - Unless approximation serves to allow use of contextually-salient number
  - Transparent in the case of round numbers (general case of contextual salience)
  - For non-round numbers, achievable through prior activation

Expressing uncertain quantities
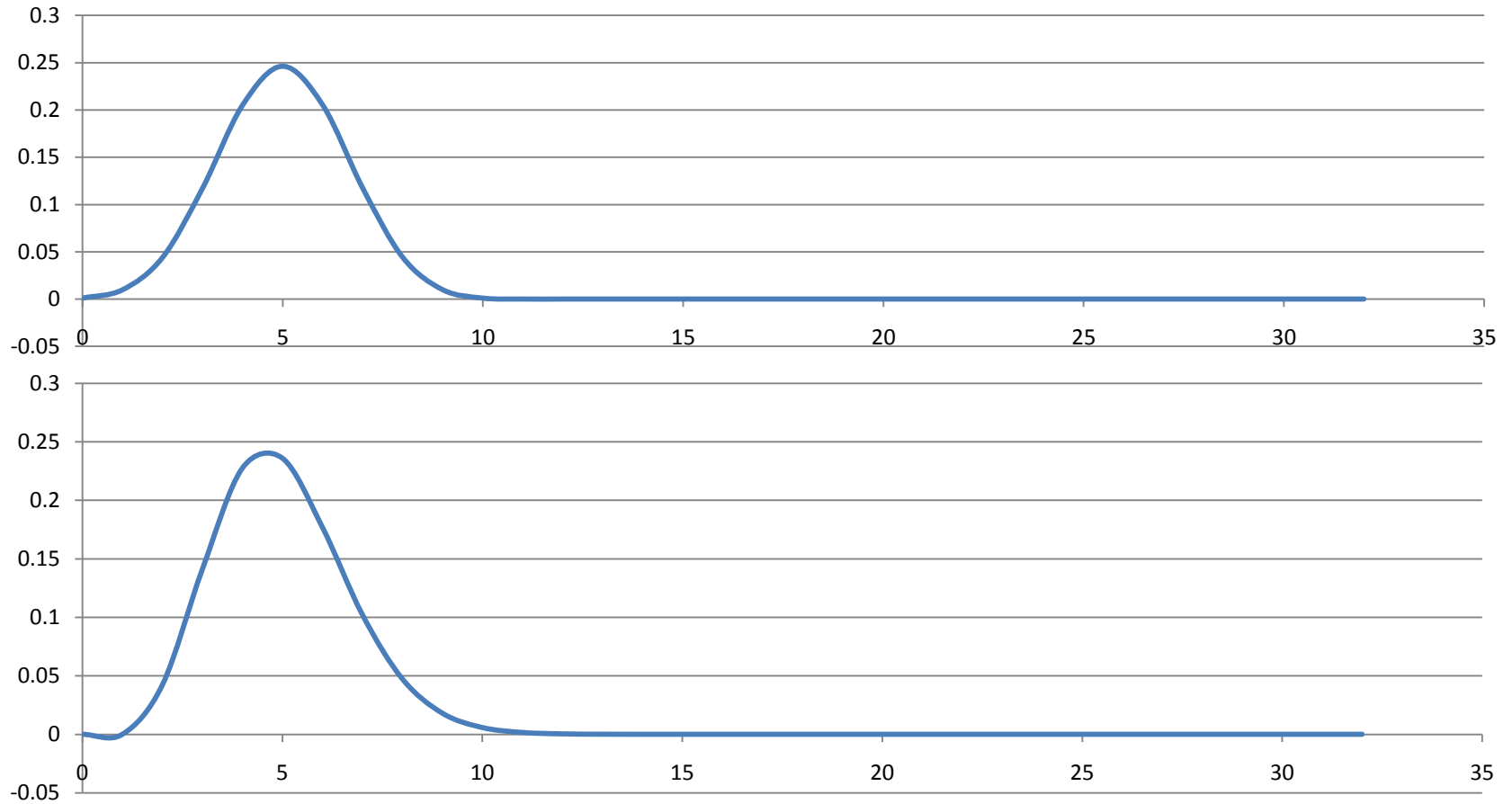
Appropriate measure of informativeness?

Conclusion

- Constraint-based model
  - Generates correct predictions for "more than", etc.
  - Generates testable predictions for approximate quantities
    - including potentially theory-critical predictions concerning failure of implicature in context
- Approximation generally potentially difficult to characterise in this way
  - Need to stipulate some kind of semantics
  - Need to measure informativeness