Ignorance in context

The interaction of modified numerals and QUDs

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Main contribution

A well-known contrast: (Geurts and Nouwen, 2007)

(1) I saw at most seven of the coins. ⇝ *not sure how many.*

(2) I saw less than eight of the coins. ⇝̸ *not sure how many.*

Empirical & methodological puzzle:

- (1,2) contrast in validity judgment task; (Geurts et al.)
- but not in truth judgment task. (Coppock et al.)

> Coppock et al.'s proposal:
> - "at most"/"less than" are *semantically distinct*;
> - this yields a difference in *ignorance implicature*;
> - to which truth judgements are *insensitive*.
>
> Problems (a.o.):
> - other implicatures *are* detected by truth judgement;
> - no other diagnostic is given for semantic difference.

We present **new evidence** for a *different* explanation:

(i) what matters is the question under discussion (QUD);

(ii) and how participants know/guess what it is.

Assumptions & crucial prediction

Ignorance inferences derive in two steps:

1. *What's the context like; was a precise answer desired?*
2. *If so, then why didn't the speaker give one?*

Step 1 relies on an explicit QUD or intonation.
Without those, participants must *guess* based on:

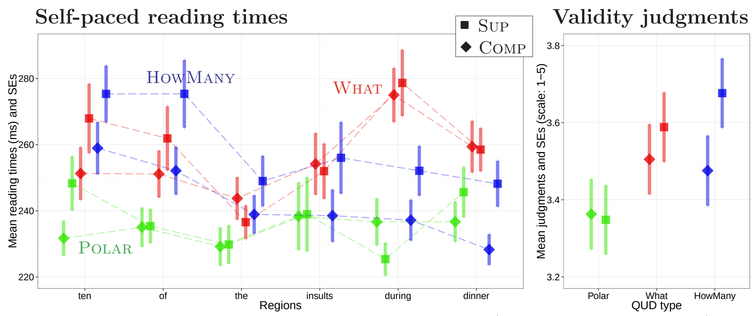
- **typical use**: (cf. Cummins & Katsos)
  "at most" ⇝ precise context;
  "less than" ⇝ imprecise context;
- **experimental task**:
  truth judgment ⇝ imprecise context;
  validity judgment ⇝ can be either.

This can explain the above puzzle.

Prediction: in a (textual) validity judgment task:

- if we present QUDs of varying explicitness,
- then the contrast (1,2) will appear & disappear.

Results of experiment I



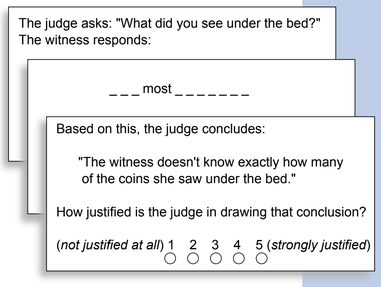
Mixed-effects ordinal probit reg. on judgments (ref. Polar+Comp):

- significant effects for What (p = .003), HowMany (p = .0004);
- *only* within HowMany, significant effect for Sup (p = .016).

Experiment design

Two experiments with the same design, three screens per stimulus:

1. **question** (QUD);
2. **answer**, shown word-by-word by self-paced reading;
3. **inference** with validity judgment (5-point Likert scale).



- 3 question types × 2 answer types = 6 conditions;
- latin square design, 108 stimuli (36 items + 72 fillers);
- 35 and 51 participants, respectively (ling. undergrads).

QUD types experiment I:

- Polar: Did you *V Mod* ten of the *N PP*?
  (*V* ∈ {see, hear, find}, *Mod* same as in answer)
- What: What did you *V PP*?
- HowMany: How many of the *N* did you *V PP*?

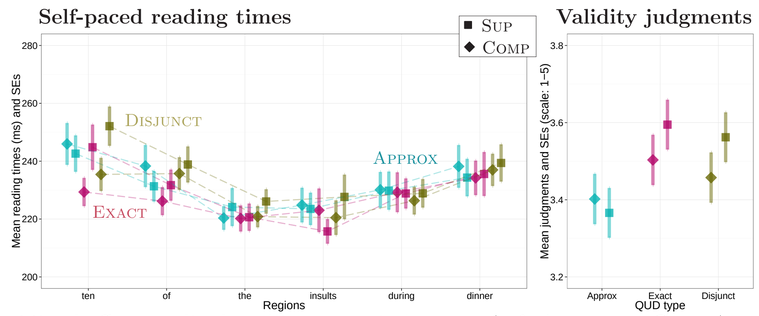
QUD types experiment II:

- Approx: Approximately how many [...]?
- Exact: Exactly how many [...]?
- Disjunct: Did you *V* eight, nine, ten or eleven [...]?

Answer types (same in both experiments):

- Sup: I *V* at most ten of the *N*s *PP*.
- Comp: I *V* less than ten of the *N*s *PP*.

Results of experiment II



Mixed-effects ordinal probit reg. on judgments (ref. Approx+Comp):

- significant effects for Exact (p = .0003), Disjunct (p = .007);
- no significant effects for Sup anywhere.

Generalizations/discussion: Validity (scale 1-5)

Weak ignorance in Polar, Approx:

- Explanation: these do not ask for a precise answer.

Strong ignorance in What, Exact, Disjunct;

- Explanation: these ask for a precise answer.

Contrast Sup/Comp only in HowMany:

- Explanation: this is underspecified for precision...
- hence the *typical use* of "at most"/"less than" kicks in.

Generalizations/discussion: Reading times

Experiment I: slower reading ~ stronger ignorance.
This may be due to:

(i) processing cost of ignorance inference; or

(ii) subvocalization with *contrastive topic* on modifier.

Experiment II: no effect, probably due to *priming*:

- fillers tested only ignorance inferences (unlike in exp. 1);
- *given* priming, slower reading ~ stronger judgments!

Broader implications

- Implicatures aren't *flimsy*; they are *context-dependent*;
- with underspecified context, typical usage kicks in;
- experimenters, control for QUD and/or intonation!

References: Coppock & Brochhagen (2013). Diagnosing truth, interactive sincerity...
Cummins and Katsos (2010). Comp. and Sup. Quantifiers: Pragmatic Effects...
Geurts & Nouwen (2007). *At least* et al: the semantics of scalar modifiers.
Geurts et al. (2010). Scalar quantifiers: logic, acquisition and processing.
Van Tiel et al. (submitted). Scalar diversity.

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