Main contribution

A well-known contrast: (Geurts and Nouwen, 2010)
(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 et al.)
  “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

Self-paced reading times

Validation judgments

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:
• Pol: 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 Ns PP.
• Comp: I V less than ten of the Ns PP.

Results of experiment II

Self-paced reading times

Validation judgments

Generalizations/discussion: Validity (scale 1-5)

Weak ignorance in Pol, 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 judgments.
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;
• the same may explain Van Tiel et al.’s scalar diversity.

References:
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.