"Maybe" not all scalar implicatures are created equal

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sometimes

...not all the time?
**Scalar inference**: The interpretation of one expression as meaning some stronger alternative expression is not true

A: “Did Quinn eat his dinner?”
B: “He ate some of it.”

= He ate at least a bit (more than none)
semantic/logical component

= He ate a bit, but *not all*
pragmatic component

A: “Will Quinn arrive on time?”
B: “It’s possible.”

= The likelihood is greater than 0%, up to and including 100%
semantic/logical component

= It’s possible, but *not certain*
pragmatic component
Not all comes from **pragmatics**; “Not none” comes from **semantics**

Semantic component: not cancellable

- Some of the classes are difficult.

  *(at least one of the classes is difficult)*

  *In fact, *none* of them are.*

Pragmatic component: cancellable

- Some of the classes are difficult.

  *(not all the classes are difficult)*

  In fact, *all* of them are
Electroencephalography (EEG)
Event-related potentials

I drink my coffee with cream and **sugar**.

I drink my coffee with cream and **dog**.
Advantages of using ERP

• ERPs are an *implicit* measure---no need to directly ask for people’s interpretation of *some*

  – As opposed to offline methods, e.g.:
    
    “*Some cats are mammals* --- is this sentence correct?”
Advantages of using ERP (2)

• High time resolution: observing what happens at the moment an inference is triggered

• Ability to distinguish between qualitatively different processes

Figure from Schacht et al. (2014)
ERP studies on scalar implicature

• *SOME* +> *NOT ALL*
  – Noveck & Posada (2003), Nieuwland et al. (2010), Politzer-Ahles et al. (2013), Hunt et al. (2013), Sikos et al. (2013), Spychalska et al. (2013), Shetreet et al. (2013, 2014), Panizza et al. (2014), Hartshorne et al. (in press), Politzer-Ahles & Gwilliams (under review), Zhan et al. (in prep.)

• *OR* +> *ONE OR THE OTHER, NOT BOTH*
  – Chevallier et al. (2010)
Figure 2: Percentages of positive responses in Experiment 1 (neutral content, dark grey) and Experiment 2 (non-neutral content, orange). The acceptance rates for entailments and unfounded inferences were 92% and 6%.

van Tiel et al. (2014)
Pragmatically infelicitous “some”

In the picture, some of the girls are sitting on blankets suntanning.

Semantically false “all”

In the picture, all of the girls are sitting on blankets suntanning.

Late posterior negativity, only for pragmatically inconsistent sentences
Auditory replication: Sustained broad negativity, only for pragmatically inconsistent sentences
ERPs suggest that semantic and pragmatic components of these quantifiers are processed differently...

...does this extend to other scalar terms?

...is this specific effect (sustained negativity) about pragmatics in general, or specific to that experimental design?
van Tiel et al. (2014)
No violation

Will all the soda in this pitcher fit into the cup?
Will all the soda in this pitcher fit into the cup?

maybe
Pragmatic violation

Will all the soda in this pitcher fit into the cup?

maybe
$N = 14$
Magnetoencephalography
$N = 11$
• In the picture, some of the girls are sitting on blankets.

• Will all the soda in this pitcher fit in the cup? Maybe.
On the way to collect acorns... Will he be able to get them all?

The squirrel might get all the acorns.
Adverbs - Semantic violation

On the way to collect acorns... Will he be able to get them all?

The squirrel might get all the acorns.
Adverbs - Pragmatic violation

On the way to collect acorns... Will he be able to get them all?

The squirrel might get all the acorns.
Back from collecting acorns... Let’s see how many of them he got.

The squirrel got some of the acorns.
Quantifiers – Semantic violation

Back from collecting acorns... Let’s see how many of them he got.

The squirrel got some of the acorns.
Back from collecting acorns... Let’s see how many of them he got.

The squirrel got some of the acorns.
$N = 9$
Conclusions

• Dissociating pragmatic from semantic ERP effects, and even observing pragmatic effects at all, depends on the experimental paradigm.

• Preliminary evidence that, when pragmatic effects were observed on *maybe*, they were different from pragmatic effects previously observed on *some*.
Why might *some* and *maybe* differ?

- Number and nature of the relevant alternatives in the scale/set?

- *Some but not all* is easy to explicitly evaluate visually; *maybe* is not, it requires some imagining

- *maybe* $\Rightarrow$ *not definitely* may be less defeasible than *some* $\Rightarrow$ *not all*
Figure 2: Percentages of positive responses in Experiment 1 (neutral content, dark grey) and Experiment 2 (non-neutral content, orange). The acceptance rates for entailments and unfounded inferences were 92% and 6%.
Incongruence effect for PW  *(SOME in a MOST context)*

Incongruence effect for all incongruent condition

Zhan, Jiang, Politzer-Ahles, & Zhou (in prep.)
Doran et al. (2012)
• Implicitures
  – *It’s raining*
    -> *It’s raining here*

• Presuppositions
  – *My brother isn’t tall*
    → I have a brother

• Conventional implicatures
  – *He’s old, but strong*
    -> there is a contrast between the properties “old” and “strong”
Thank you!

Maybe I can answer some of your questions...
– You found all of them  ➔ You found some of them
– You didn’t find all of them  ← You didn’t find any of them

– brilliant  ➔ smart
– not brilliant  ← not smart
Scalar inferences (e.g. Some $\not\rightarrow$ not all)

- Why didn’t the speaker utter a stronger alternative (“all”)?
- Assuming the speaker is cooperative, she must not believe the alternative is true
- Assuming the speaker has an opinion one way or another, she must believe the alternative is false

Ad-hoc inferences (e.g. The fork $\not\rightarrow$ the fork and not the spoon)

- Why didn’t the speaker utter a stronger alternative (“the fork and the spoon”)?
- Assuming the speaker is cooperative, she must not believe the alternative is true
- Assuming the speaker has an opinion one way or another, she must believe the alternative is false
• Bob: “Some of the students passed”
  – Weak implicature: Bob doesn’t believe that *some of the students passed*
  – Strong implicature: Bob believes that *not all of the students passed*
Auditory experiment: Sustained broad negativity, only for pragmatically inconsistent sentences.
Stimuli (2)

• “Will all these books fit inside the bookbag?”
• “Is this too many books to fit in the bookbag?”
Stimuli (3)

<table>
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<th>“definitely not”</th>
<th>“maybe”</th>
<th>“definitely”</th>
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<tr>
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<td>40</td>
<td>20</td>
</tr>
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</tr>
<tr>
<td>DEFINITELY</td>
<td>20</td>
<td>40</td>
<td>30</td>
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</tbody>
</table>

90 additional fillers: yes/no questions using the same pictures