Testing variation across exclusive modifiers

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Exclusives

(1) Exclusive modifiers in English

a. Mary **only** ate the cookies.
b. Mary **just** ate the cookies.
c. Mary **merely** ate the cookies.

→ Mary ate the cookies

→ Mary did not eat alternatives to the cookies

Along which parameters do exclusives vary?
Parameter 1: scale structure

(2) Lexical entry schema for exclusives (Coppock & Beaver 2014)

a. \( \text{MIN}(p) = \lambda w. \exists q \in Cq[q(w) \land q \geq p] \)
b. \( \text{MAX}(p) = \lambda w. \forall q \in Cq[q(w) \rightarrow p \geq q] \)
c. \( \text{[only]} = \lambda p \lambda w: \text{MIN}(p)(w).\text{MAX}(p)(w) \)

Variation in the \( \geq \) relation results in different readings.

(3) The student is **only** intelligent.

\( \rightarrow \) The student is not brilliant. \hspace{1cm} // rank-order

\( \rightarrow \) The student is not curious, not charming, etc.  \hspace{1cm} // complement-exclusion
Variation in scale structure

Horn (2000):
- *only* = complement-exclusion, *just* = rank-order

Coppock & Beaver (2014):
- *just* and *only* allow both, *merely prefers rank-order*
- resulting from ‘soft preferences’ rather than absolute restrictions?
Parameter 2: strength of exclusion

(4) Noncanonical “weak” just (Warstadt 2020) (see also Wiegand 2018; Beltrama 2021)

a. The lights in this place just/only/merely turn off and on.
   → The lights turn off and on for no reason

b. The pumpkin bisque is just/only/merely delicious!
   → That’s all there is to say

“Weak” readings of just (paraphrasable with simply): not exclusive in the same way
Parameter 2: strength of exclusion

The exclusion operation in these cases needs to be relaxed:

– *just* is not declaring alternatives false…
– … so much as uninformative, unknown, unassertable, irrelevant, etc.

Warstadt (2020): *just* is a weak exclusive; *only* is a strong exclusive

Cf. Coppock & Beaver (2014), who take both *just* and *only* to be ‘strong’.

→ worth testing experimentally
Scalar diversity

Scalar expressions vary in how likely they are to lead to exclusionary inference

(i.a. van Tiel, et al. 2016; Sun et al., 2018; Gotzner et al., 2018; Pankratz & van Tiel, 2021)

(5) Mary ate some of the cookies.

→ SI: Mary ate some but not all of the cookies

(6) The student is intelligent.

→ SI: The student is not brilliant
Exclusives do not eliminate scalar diversity (!)

Ronai & Xiang (2022): **scalar diversity persists** even in the presence of only

Mary: *The student is only intelligent.*

Would you conclude from this that Mary thinks the student is not brilliant?

Yes.  No.

“*Yes*” = calculation of exclusionary inference
Exclusives do not eliminate scalar diversity (!)

- Result of variation in scale structure (i.e. the $\geq$ relation)?

- Exclusionary inference depends on whether the higher scalar term (*brilliant*) is included as one of the relevant alternatives in context:
  - More likely with rank-order *only* than complement-exclusion *only*.
    
    (3) The student is *only* intelligent.
    
    $\rightarrow$ The student is not curious, not charming, etc.  // complement-exclusion
    
    $\rightarrow$ The student is not brilliant.  // rank-order
This paper

We present the first experimental assessment of variation among exclusives, focusing on **scale structure** and **strength of exclusion**.

- Strength of exclusion: *only* vs. *just*
- Scale structure bias: *only* vs. *merely*

How does the probability of exclusionary inference vary between exclusives?
Methods

Experiment 1: 39 participants

Mary: The student is just intelligent.

Would you conclude from this that Mary thinks the student is not brilliant?

Yes.  No.

“Yes” = calculation of exclusionary inference

Same task and (51 of the) items as Ronai & Xiang (2022)
Methods

Experiment 2: 35 participants

Mary: *The student is merely intelligent.*

Would you conclude from this that Mary thinks the student is not brilliant?

Yes.  No.
Predictions

Experiment 1:

- *just* is a weak exclusive, *only* is a strong exclusive (Warstadt, 2020)
- \( \rightarrow \) lower rates of inference calculation for Exp. 1 than was found for *only*

Experiment 2:

- *only* allows both complement-exclusion and rank-order, *merely* prefers rank-order readings (Coppock & Beaver, 2014)
- all our items test rank-order alternatives
- \( \rightarrow \) higher rates of inference calculation for Exp. 2 than was found for *only*

(We can’t straightforwardly infer anything about scale structure bias with *just*)
Results

Just vs. only *
(Estimate=-0.7
SE=0.28
z=-2.5
p<0.05)

Merely vs. only ***
(Estimate=0.96
SE=0.28
z=3.38
p<0.001)

Just vs. SI ***
(Estimate=1.32
SE=0.25
z=5.35
p<0.001)
Discussion

Exp. 1: Results consistent with just as a “weak” exclusive

Exp. 2: merely strongly biases toward, if not requires rank-order scales
Interaction with scalar diversity?

- As SI rates increase, so do rates with *just* (Kendalls’ tau-b = 0.59, p < .001).
- As rates with *just* increase, so do rates with *only* (tau-b = 0.59, p < .001).
- Rates with *merely* are also correlated with *only* (tau-b = 0.53, p < .001).

Only a small minority (≈ 5) of scales deviate from the general patterns.

→ lexico-semantic factors in the scalar diversity phenomenon
In what sense is *just* weaker than *only*?

1) *Just* excludes via **weaker semantic operation** than *only*?

2) *Just* is **lexically ambiguous** between exclusive and nonexclusive readings?
In what sense is *just* weaker than *only*?

3) *Just* excludes **wider range of** possible **alternatives**?

*Warstadt (2020): just* can **answer “potential” questions** in addition to the QUD:

(7)  
  a. The lights in this place **just** turn off and on.  
  b. Why do the lights turn off and on?

*just* in (7-a) signals that the hypothetical followup (7-b) is unanswerable.

If *just* were excluding potential questions in Experiment 1, the stronger scalar term would have been an alternative less frequently.
Experiment 3

Predictions:

- higher rates for QUD than null context (i.a., Degen 2013; Zondervan et al. 2008; Ronai & Xiang 2022)

- Warstadt (2020): *just* can exclude answers to questions other than the QUD → interaction of exclusive and context:
  
  adding the **QU**D has less of an effect on *just* than *only*

Sue: *Is the student brilliant?*
Mary: *She is just intelligent.*

Would you conclude from this that Mary thinks the student is not brilliant?

[ ] Yes.  [ ] No.
Results

Exclusive ***
(Estimate=0.86, SE=0.25, z=3.47, p<0.001)

Context ***
(Estimate=1.84, SE=0.25, z=7.39, p<0.001)

Interaction n.s.
(Estimate=0.18, SE=0.46, z=0.39, p=0.7)
Discussion

We did not find statistical interaction between exclusive and context.

- *just* and *only* shown to be equally QUD-sensitive
- This speaks against a unified, potential question-answering theory of *just*

Lexical ambiguity account:

- Exclusive *just* answers the QUD, other entries do not
- Participants in Exp. 3 assumed the QUD was relevant, leading to an increase in exclusive *just* interpretations (as compared to Exp. 1)
Conclusions

Novel experimental evidence testing variation across exclusive modifiers:

- **Just** excludes less robustly than **only**

- **Merely** strongly prefers **rank-order** scales

- **Just** and **only** are equally **QUD-sensitive**
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<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>SI</td>
<td>33.2%</td>
</tr>
<tr>
<td>Just</td>
<td>52.9%</td>
</tr>
<tr>
<td>Only</td>
<td>65.5%</td>
</tr>
<tr>
<td>Just + QUD</td>
<td>78.7%</td>
</tr>
<tr>
<td>Merely</td>
<td>80.2%</td>
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<tr>
<td>Only + QUD</td>
<td>88.3%</td>
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Thank you!

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Ambiguity in focus associate

Exp. 2: Reduced ambiguity in the identity of the focus associate?

(9)  a. Phoebe only \([\text{wants}]_{F} \text{ a car}\)
    b. Phoebe only wants \([\text{a car}]_{F}\)

(10) a. Phoebe merely \([\text{wants}]_{F} \text{ a car}\)
    b. Phoebe merely wants \([\text{a car}]_{F}\)

(10b) leads to a complement-exclusion reading, which conflicts with \textit{merely}’s scale structure preference
Parameter 2: strength of exclusion

Semantics literature is largely undecided on how to analyze these cases.

Wiegand (2018):
- just excludes alternatives to covert modifiers with trivial semantic content.

Warstadt (2020):
- just can answer ‘potential’ questions in addition to the current QUD.

Beltrama (2021):
- just excludes metalinguistic alternatives at the speech act level.