

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. $\text{MIN}(p) = \lambda w. \exists q \in \text{co}[q(w) \wedge q \geq p]$
- b. $\text{MAX}(p) = \lambda w. \forall q \in \text{co}[q(w) \rightarrow p \geq q]$
- c. $[[\textit{only}]] = \lambda p \lambda w: \text{MIN}(p)(w). \text{MAX}(p)(w)$

Variation in the \geq relation results in different readings.

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

→ The student is not brilliant.

// rank-order

→ The student is not curious, not charming, etc.

// 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.

→ The student is not curious, not charming, etc.

// complement-exclusion

→ 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)
- → **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
- → **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 ***

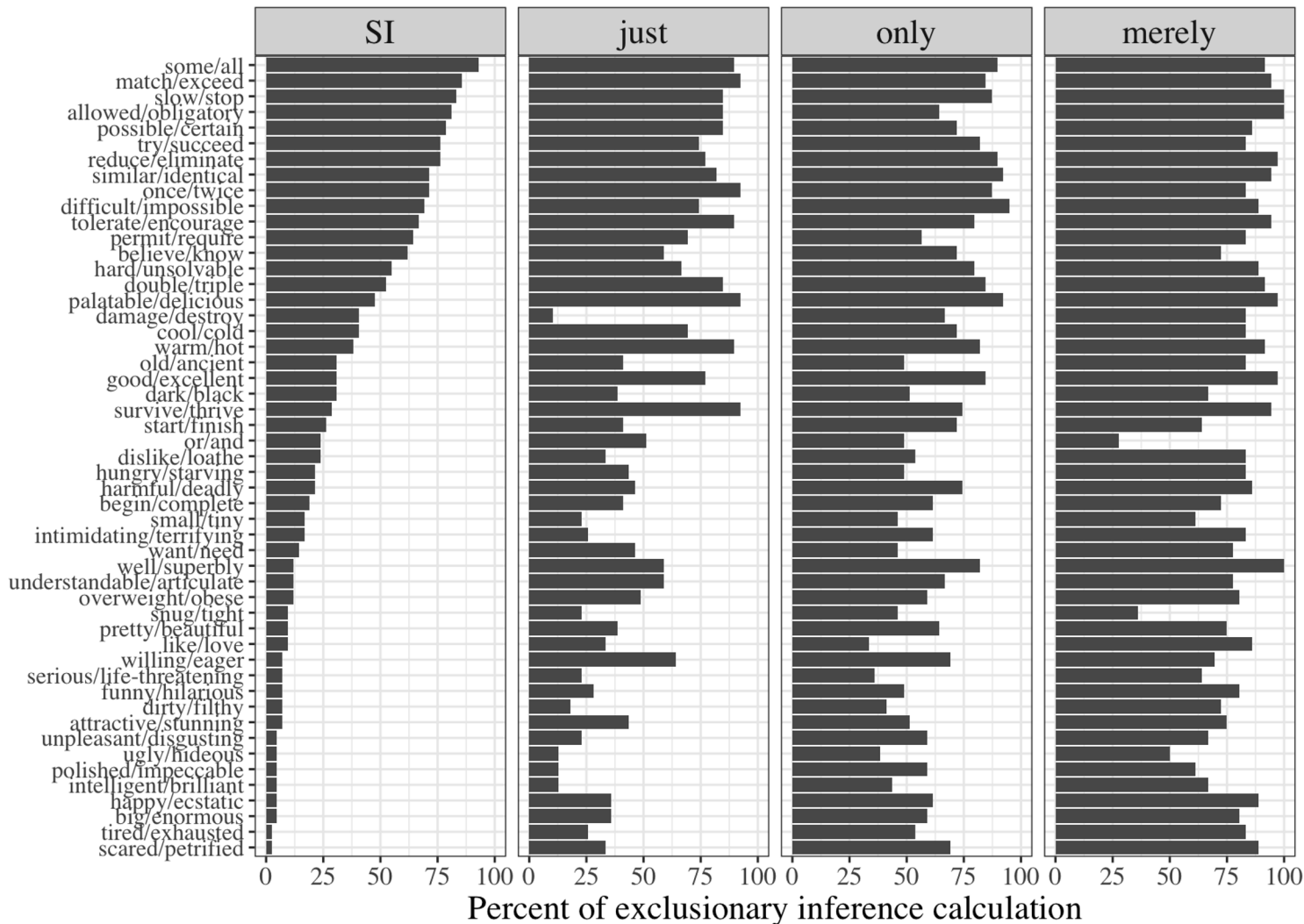
(Estimate=1.32

SE=0.25

z=5.35

p<0.001)

Scales



Percent of exclusionary inference calculation

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

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.

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 **QUD** has less of an effect on *just* than *only*

Results

Exclusive ***

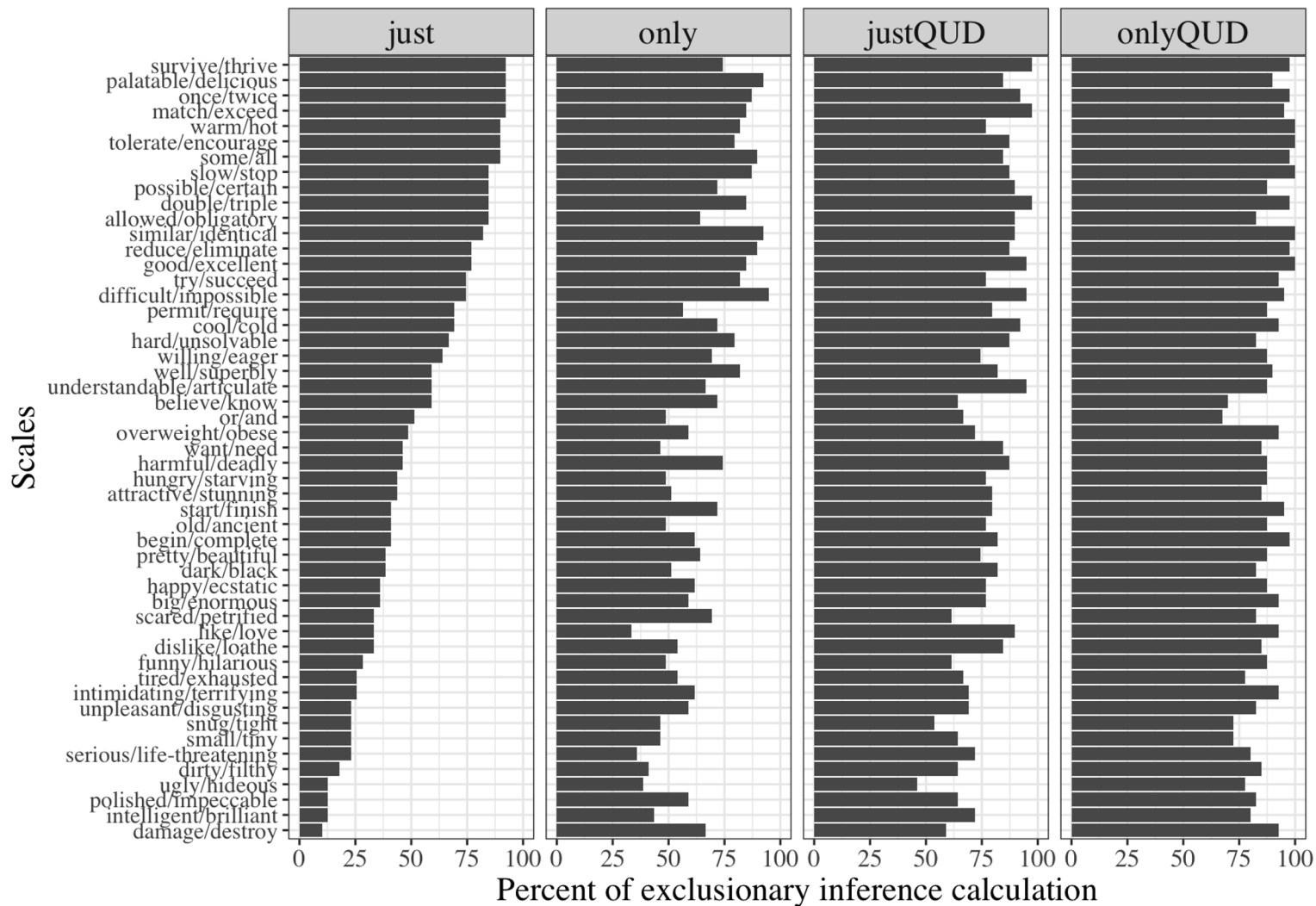
(Estimate=0.86
SE=0.25
z=3.47
p<0.001)

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* strength
- ***Merely* strongly prefers rank-order** scales scale structure
- ***Just* and *only* are equally QUD-sensitive** QUD

SI	33.2%
Just	52.9%
Only	65.5%
Just + QUD	78.7%
Merely	80.2%
Only + QUD	88.3%

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 [**wants**]_F a car

b. Phoebe only wants [**a car**]_F

(10) a. Phoebe merely [**wants**]_F a car

b. ~~Phoebe merely wants [**a car**]_F~~

(10b) leads to a complement-exclusion reading, which conflicts with *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