

I have no idea if factivity is categorical. Did  
Mandelkern et al. 2020 discover that it is?

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(based on joint work with Judith Degen)

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Which lexical representations of clause-embedding predicates make empirically adequate predictions in models of projection inferences?

Contemporary projection analyses assume lexical representations that predict distinctions between **factive** and nonfactive predicates.

(e.g., Heim 1983, van der Sandt 1992, Schlenker 2010, Abrusán 2011, Romoli 2015, Simons et al 2017)

Scott: “Does Cole **know** that Julian dances salsa?”

→ speaker believes that Julian dances salsa

Scott: “Does Cole think that Julian dances salsa?”

~~→ speaker believes that Julian dances salsa~~



Which lexical representations of clause-embedding predicates make empirically adequate predictions in models of projection inferences?



*Language 2022*

## ARE THERE FACTIVE PREDICATES? AN EMPIRICAL INVESTIGATION

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“...there is little empirical support [in our data] for the assumed categorical distinction between factive and nonfactive predicates” (p.552)



## Experiment 1a from Degen & Tonhauser 2022 (*Language*)

[six experiments and analyses of three existing datasets]

20 clause-embedding predicates

- factive: **know, discover, reveal, see, be annoyed**
- non-factive: *think, pretend, suggest, be right, demonstrate, acknowledge, admit, announce, confess, confirm, establish, hear, inform, prove*

x 20 embedded clauses

Total: 400 polar questions

Scott asks: “Did Amanda acknowledge that Julian dances salsa?”

**Helen asks:** *"Did Amanda discover that Danny ate the last cupcake?"*

Is Helen certain that Danny ate the last cupcake?

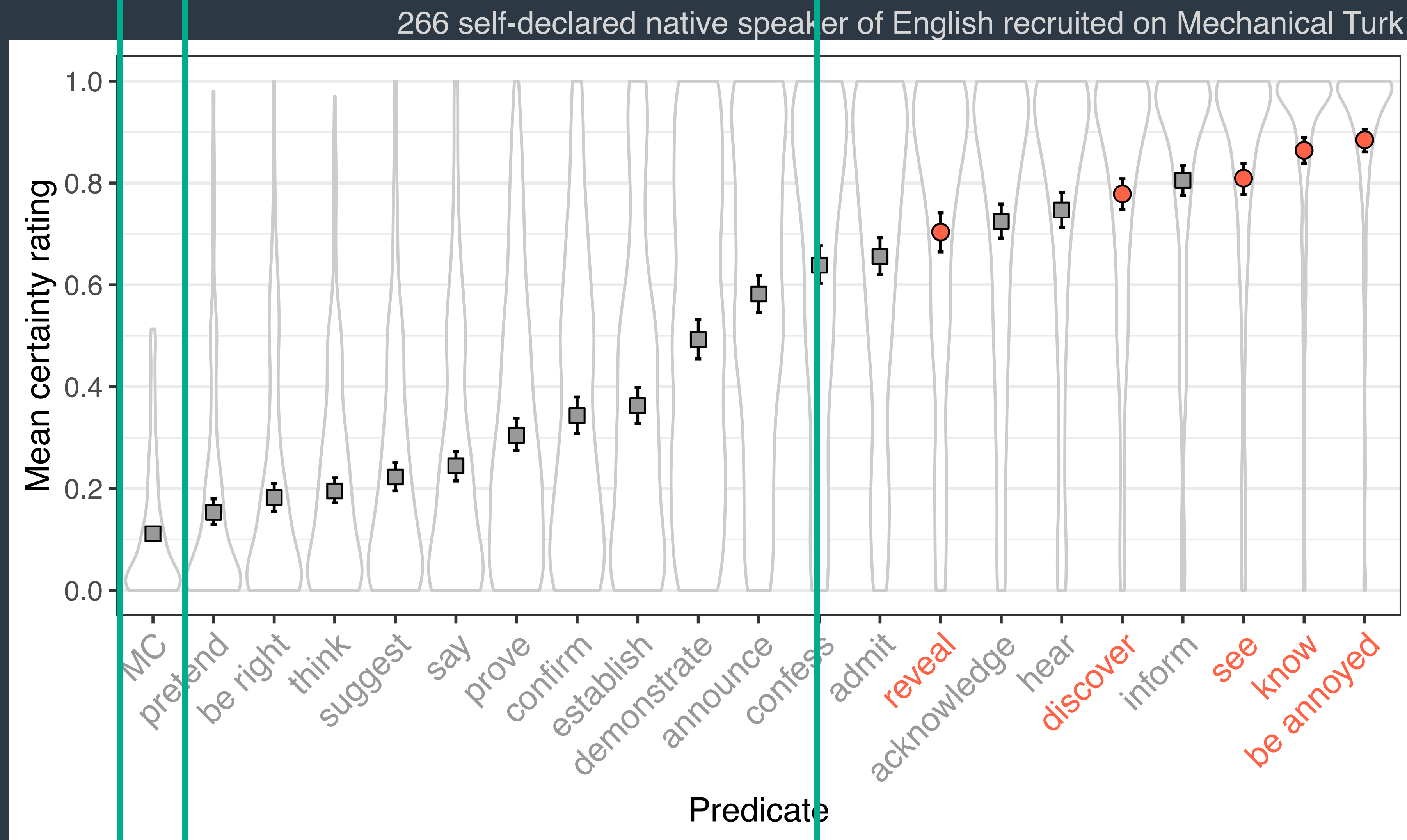
**no**

**yes**

Next

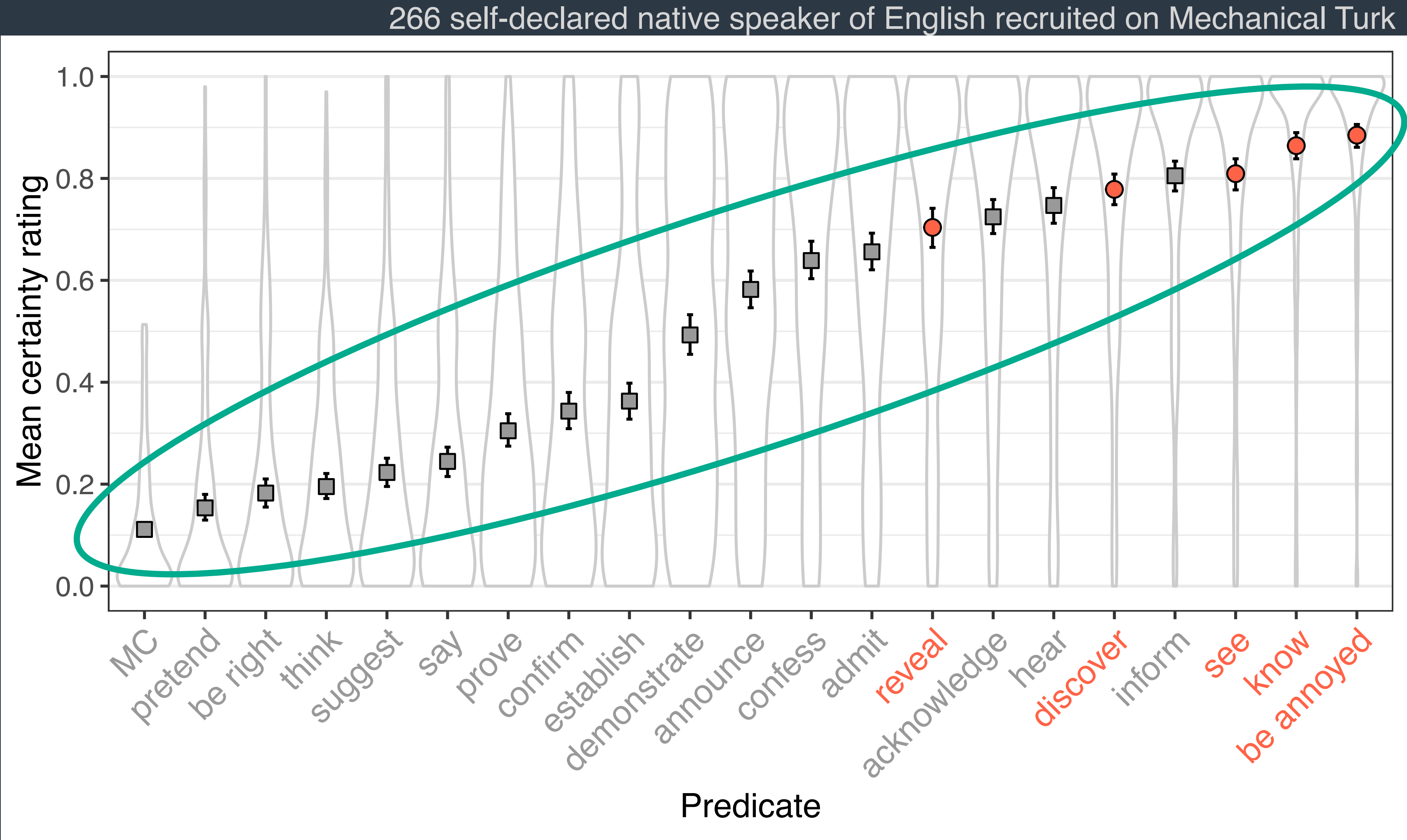
Every participant rated each of the 20 clause-embedding predicates and six main clause controls ("Does Ann have a new hat?" — Is the speaker certain that Ann has a new hat?).

# Factive predicates are not categorically different from nonfactive ones



[also in  
Exp 1b &  
the three  
datasets]

# Even the contents of non-factive predicates project, albeit to different degrees



[also in  
Exp 1b &  
the three  
datasets]





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## ARE THERE FACTIVE PREDICATES? AN EMPIRICAL INVESTIGATION

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“...projection is sensitive to meaning distinctions between clause-embedding predicates that are more fine-grained than factivity” (p.552)



## Mandelkern, Zehr, Romoli & Schwarz (2020, *Linguistics & Philosophy*)

- “We should think twice before embracing a notion of presupposition projection that is gradient based on results from inference tasks alone” (p.497)
- “Inference tasks to some degree invite subjects to make the inference in question if it is compatible with the assertion, since the content in question is right there before the subjects’ eyes” (p.498)



Scott: “Did Cole **reveal** / acknowledge that Julian dances salsa?”

- Naturalness ratings in explicit ignorance contexts “distinguish a broad class of natural and invited pragmatic inferences from those that are really encoded as presuppositions, and thus have no choice but to project.” (p.497)

Scott: “I don’t know if Julian dances salsa.

Did Cole **reveal** / acknowledge that Julian dances salsa?”

## Mandelkern, Zehr, Romoli & Schwarz Exp 3 (2020, *Linguistics & Philosophy*)

- Four presupposition triggers: *be happy*, *be aware*, *stop*, *continue*
- Four non-triggers: *be hoping*, *be sure*, *now frown on*, *enjoy*

**BUT:**

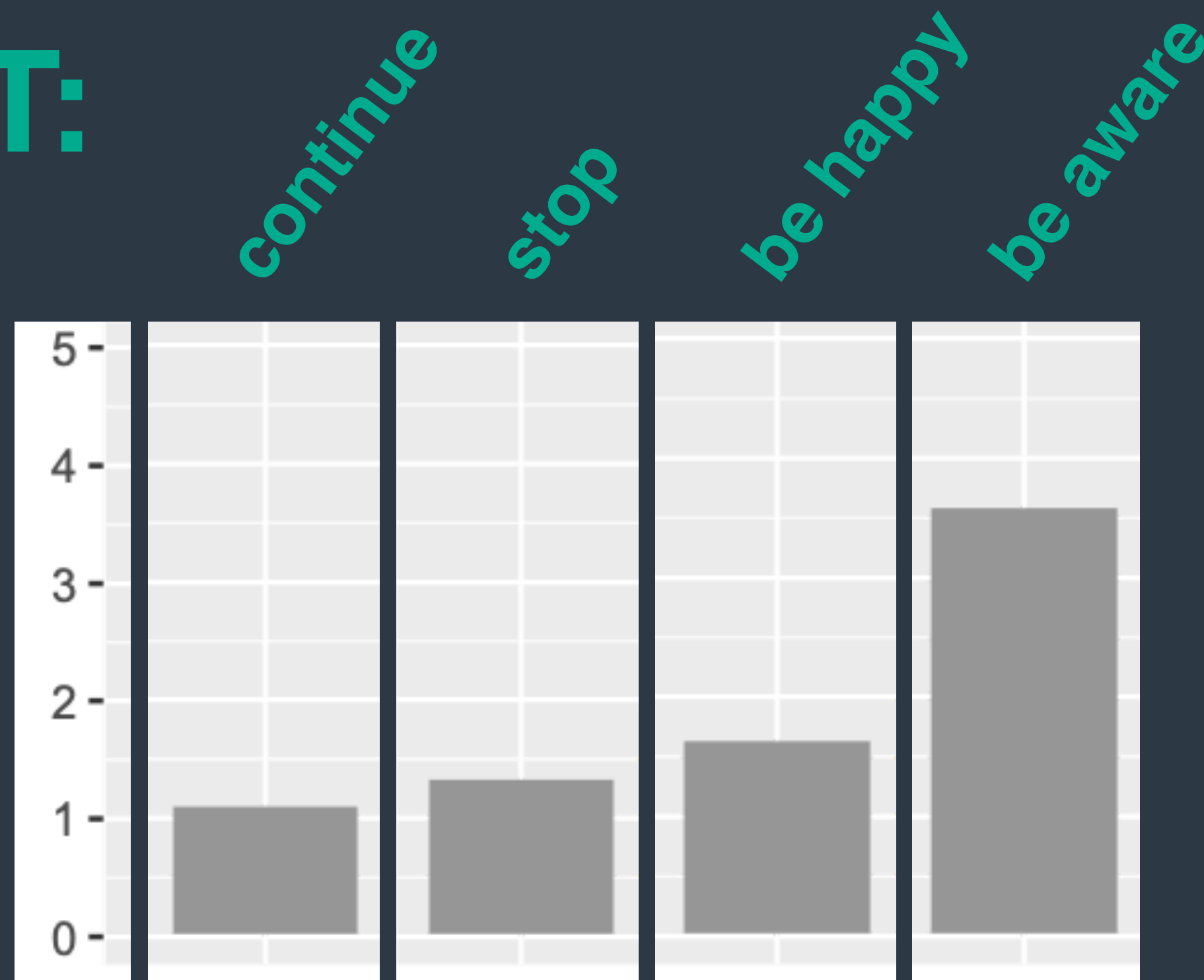


Fig 8 (Appendix), explicit ignorance context, no conjunct

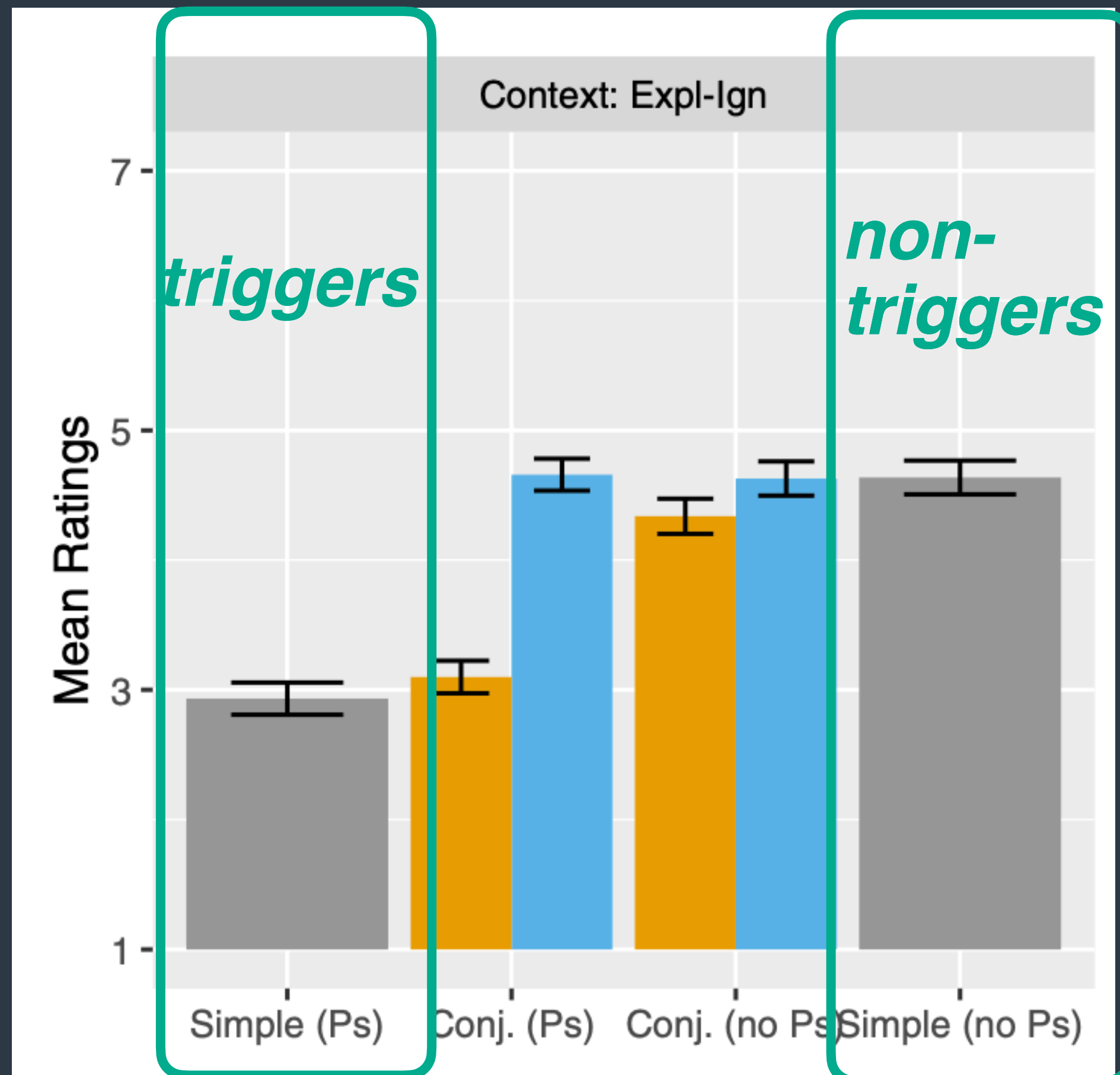


Fig 3, partial

## Experiment

- Goal: Investigate whether naturalness ratings in explicit ignorance contexts categorically distinguish factive predicates (encode a presupposition) and nonfactive predicates (do not encode a presupposition).
- Target materials

1. Scott: “I don’t know if Julian dances salsa.	[explicit ignorance]	12
2. Scott: “Julian is German.	[low prior probability]	4
3. Scott: “Julian is Cuban.	[high prior probability]	4

Did Cole acknowledge that Julian dances salsa?” (400 polar questions)

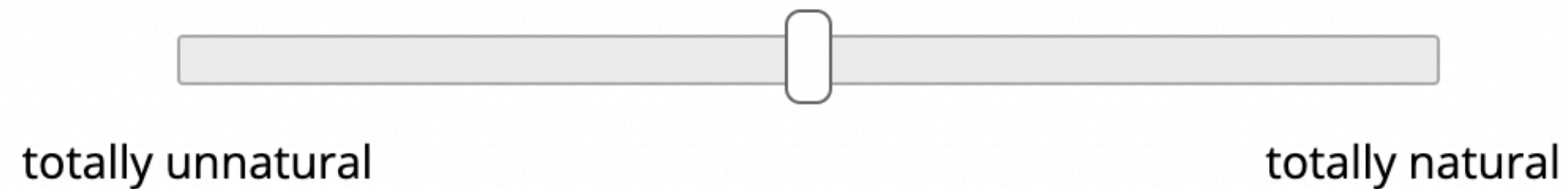
(Lower and higher probability facts from Degen & Tonhauser 2021, *Open Mind*)

- 398 participants recruited on Prolific, everybody rated each of the 20 predicates



**Diane:** *"I don't know if Emily bought a car yesterday. Does Brian think that Emily bought a car yesterday?"*

How natural does the question sound in this context?



Continue

4 practice trials familiarized participants with the task.

20 target items (randomly created for each participant)

6 filler items

“I don’t know if...

Mandelkern et al 2020: *stop, continue*

Kalomoiros & Schwarz 2021: *stop, continue, again*

Simons 2001: *too, also, it-cleft, again* vs. *stop*

“...Stephen was ever in the habit of vaping. Has Stephen recently **stopped** vaping?”

“...John was ever reading “Dune”. Has John recently **continued** reading “Dune”?”

“...William was ever interested in history. Is William interested in history **again**?”

“...Ann plays any instrument. Does Ann play the flute, **too**?”

“...Svenja plays any sport. Does Svenja **also** play soccer?”

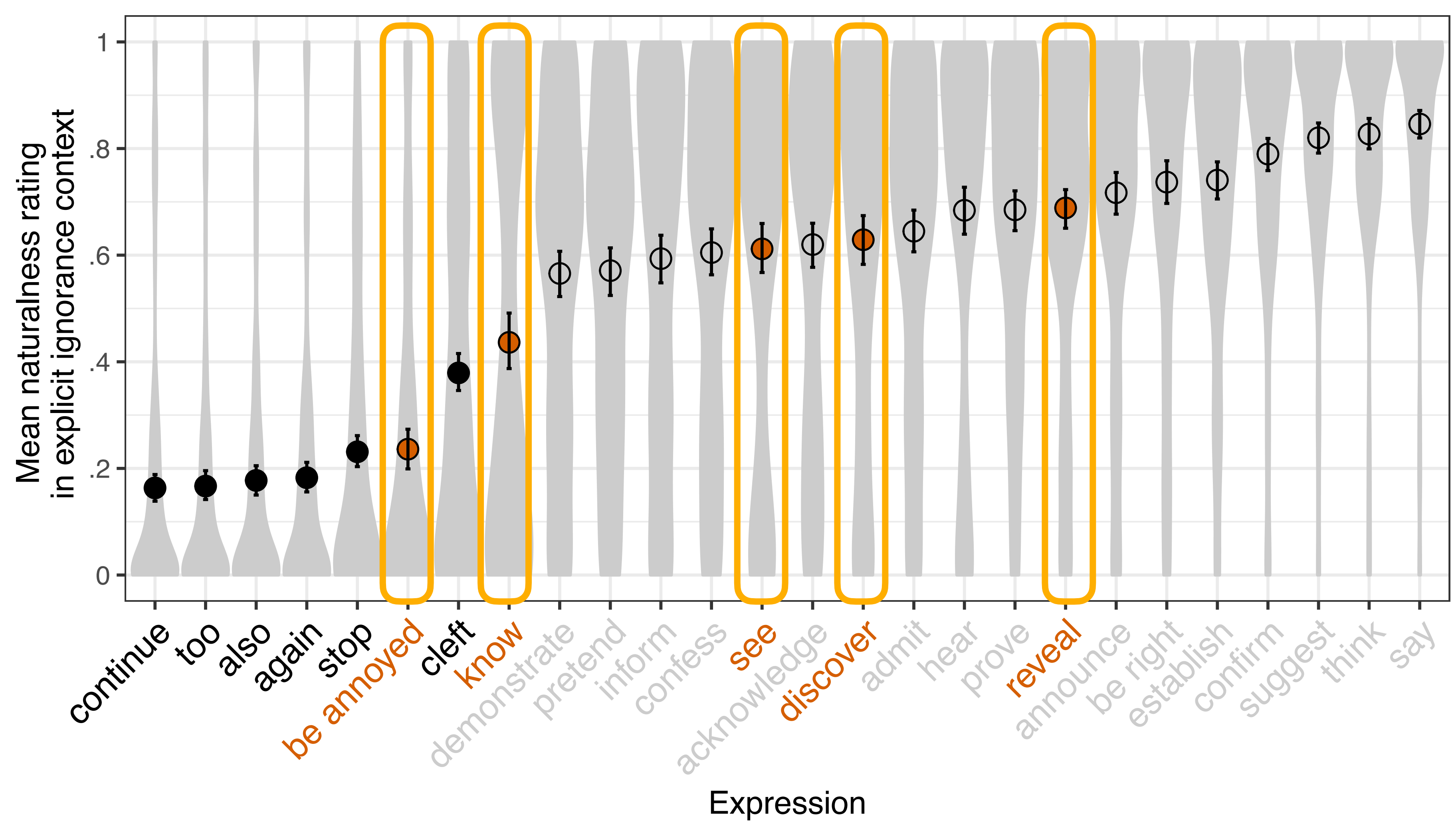
“...anybody played outside with the kids. **Was it Jack** who played outside with the kids?”

4 control items (no explicit ignorance context), which were expected to be acceptable and were used to exclude participants’ data.



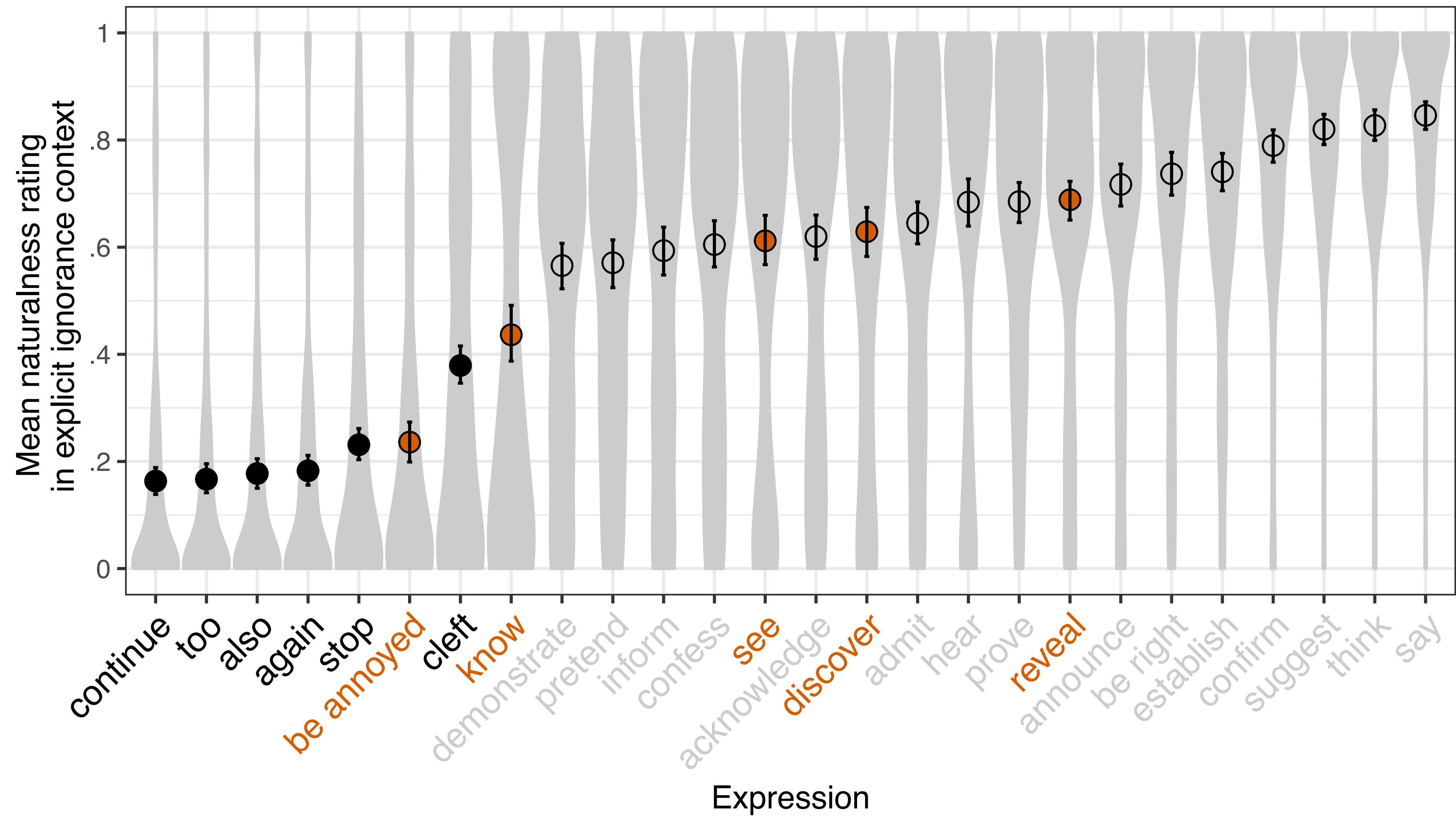
# Factive predicates are not categorically different from nonfactive ones

370 self-declared native speakers of American English





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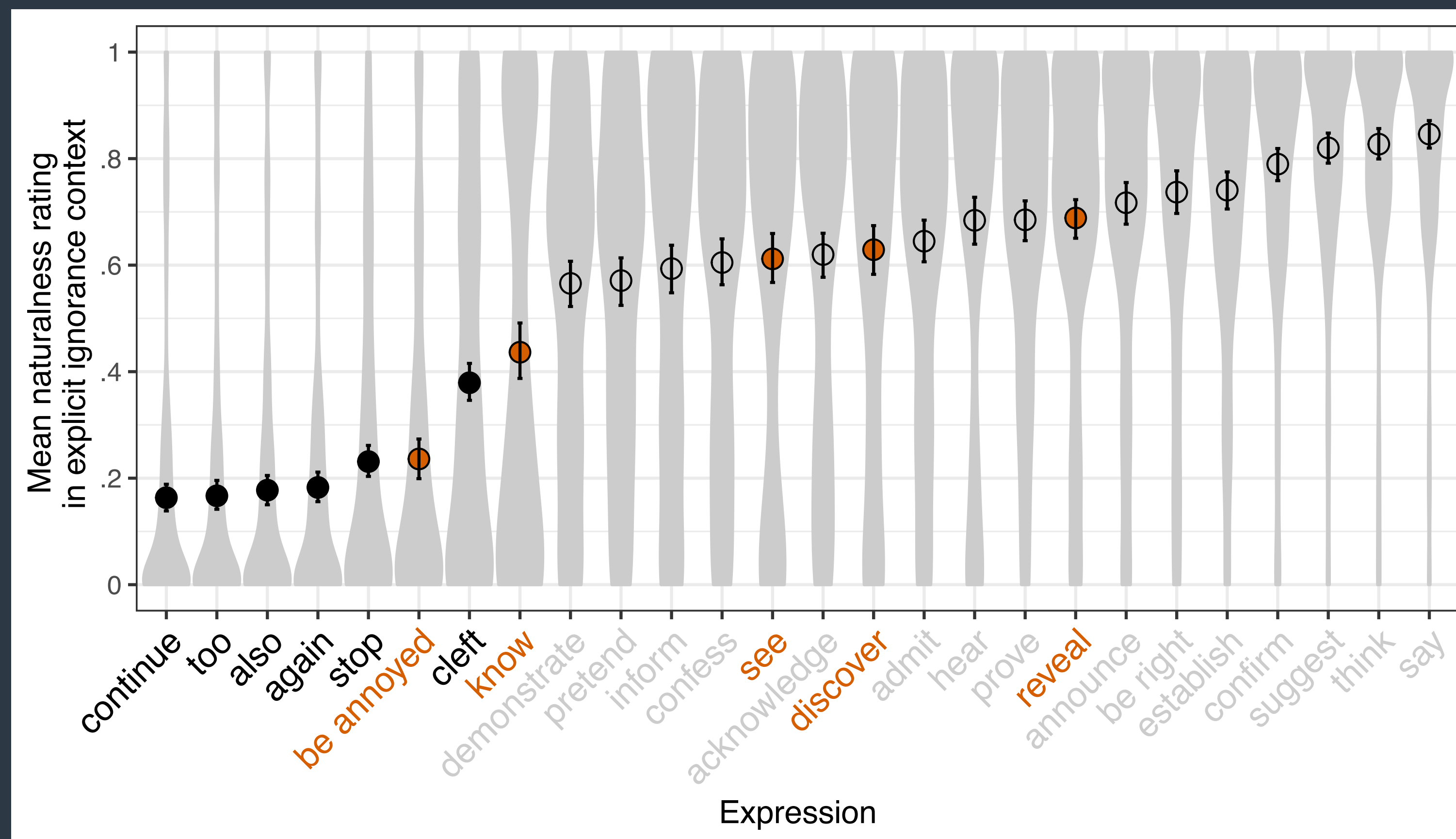


# The purportedly “factive” predicates do not form a natural class

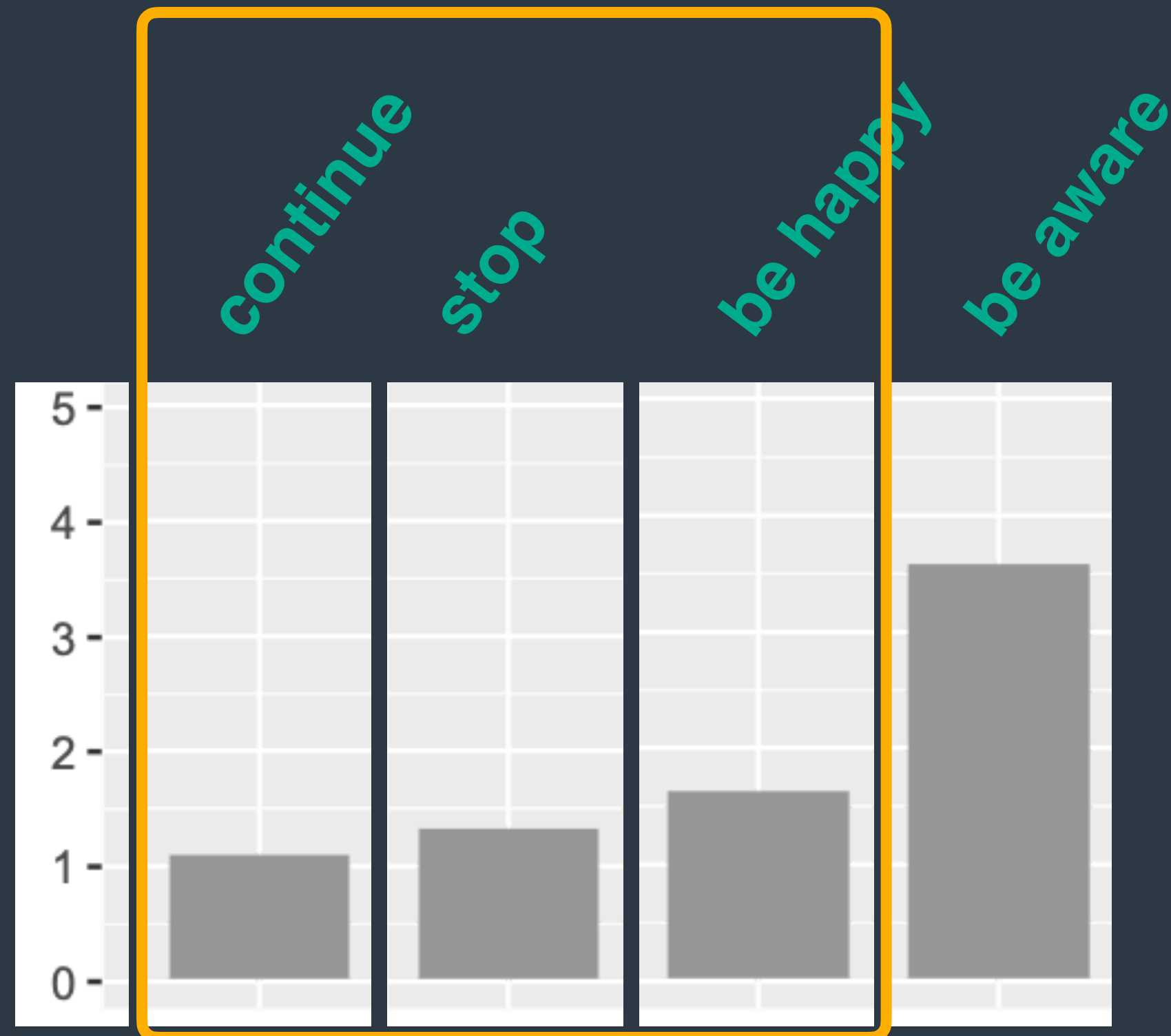


Mandelkern et al 2020, Fig 8 (Appendix), explicit ignorance context, no conjunct

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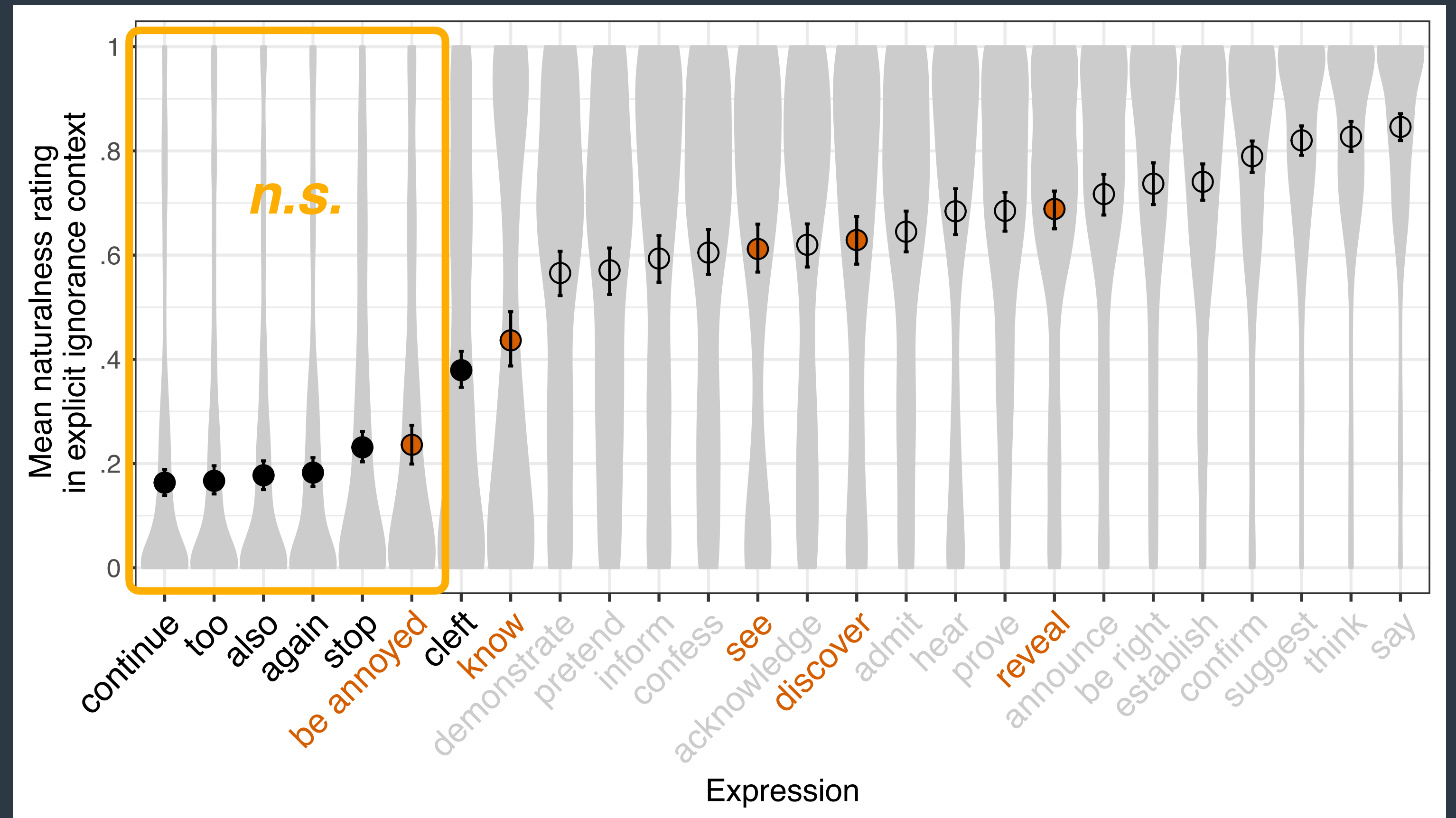


# Emotive predicate rated as unnatural as hard triggers, and “continue” and “stop”



Mandelkern et al 2020, Fig 8 (Appendix), explicit ignorance context, no conjunct

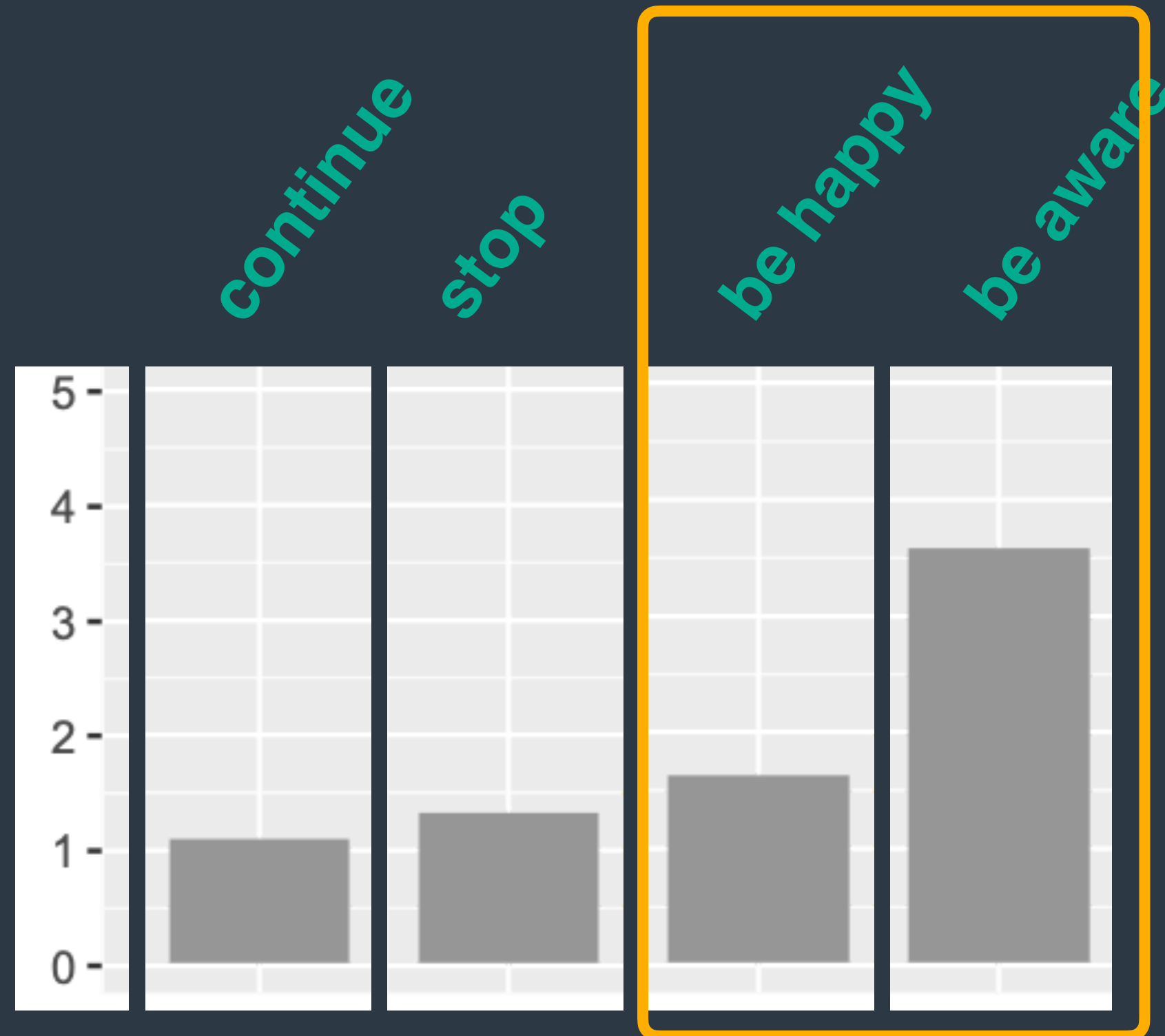
370 self-declared native speakers of American English



LMEM predicting naturalness rating from expression, random by-participant and by-content intercepts, multiple comparisons with lsmeans package, adjusted for multiple comparisons.

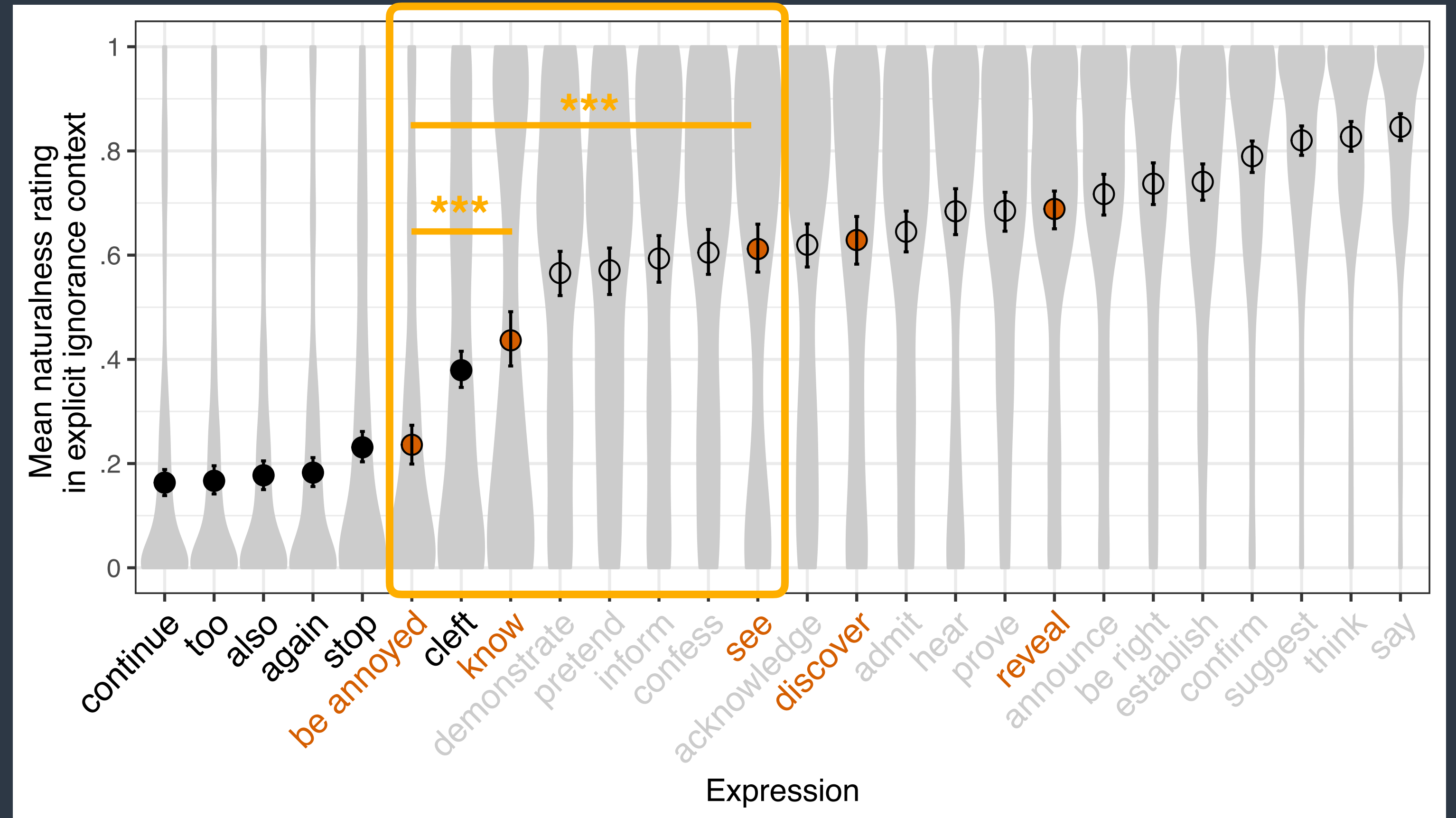


# Cognitive predicates rated more natural than emotive predicate



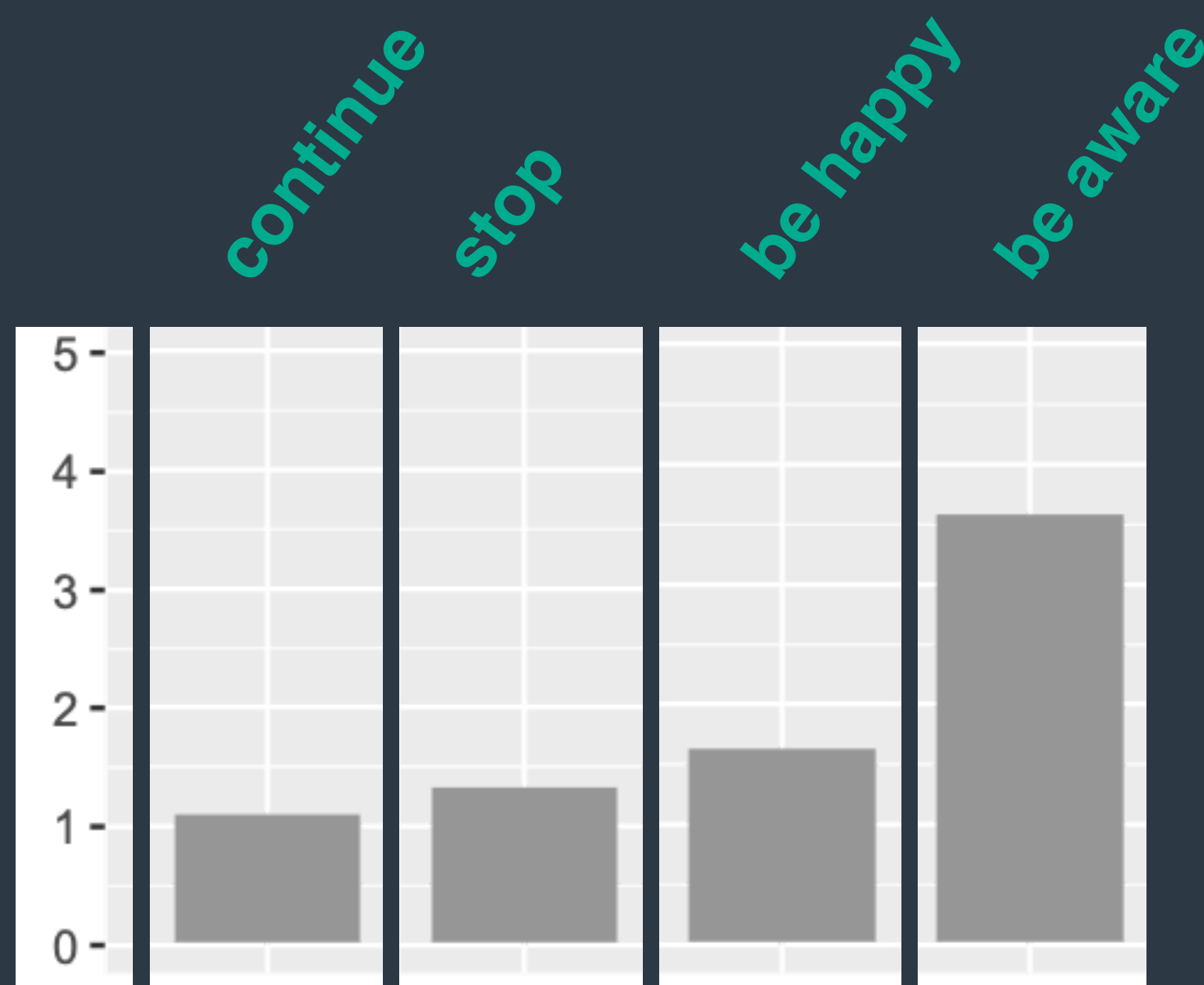
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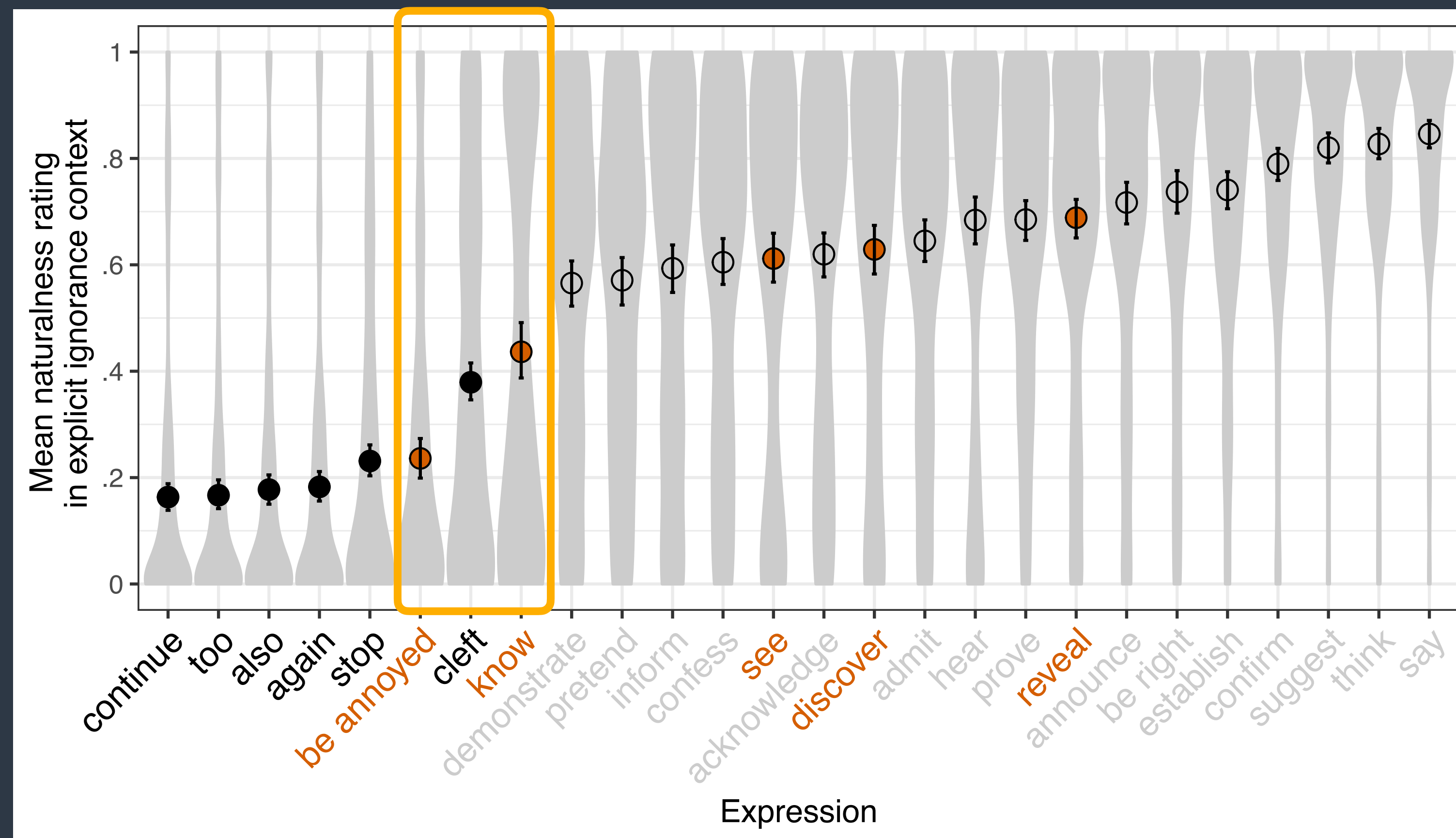
LMEM predicting naturalness rating from expression, random by-participant and by-content intercepts, multiple comparisons with lsmeans package, adjusted for multiple comparisons.

Does this mean that “be annoyed” is a presupposition trigger and “know” is not?



Mandelkern et al 2020, Fig 8 (Appendix), explicit ignorance context, no conjunct

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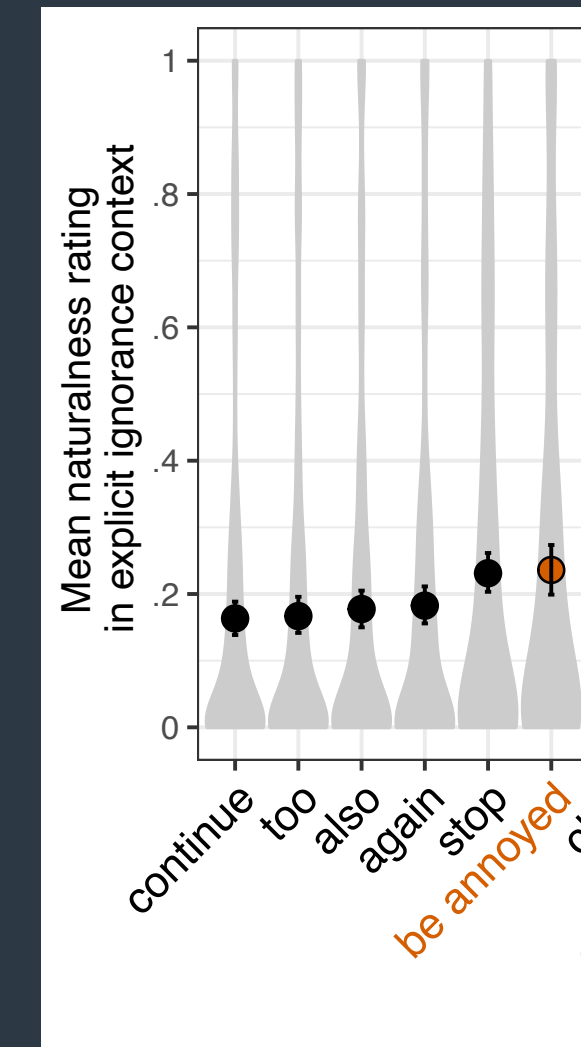
Of course not.

- Naturalness ratings in explicit ignorance contexts are sensitive to anaphoric requirements on context (e.g., *continue*, *too*, *also*, *again*).
- Many expressions with projective content are not anaphoric (Tonhauser et al 2013). Other factors may modulate naturalness ratings in explicit ignorance contexts.

Scott: “I don’t know if Julian dances salsa.  
Is Cole annoyed that Julian dances salsa?”

QUD: Does  
Julian dance  
salsa?

CC not at-issue  
(Tonhauser, Beaver & Degen 2018)



- The low naturalness rating for “be annoyed” in explicit ignorance contexts may be due to the mismatch in at-issueness of the content of the clausal complement.



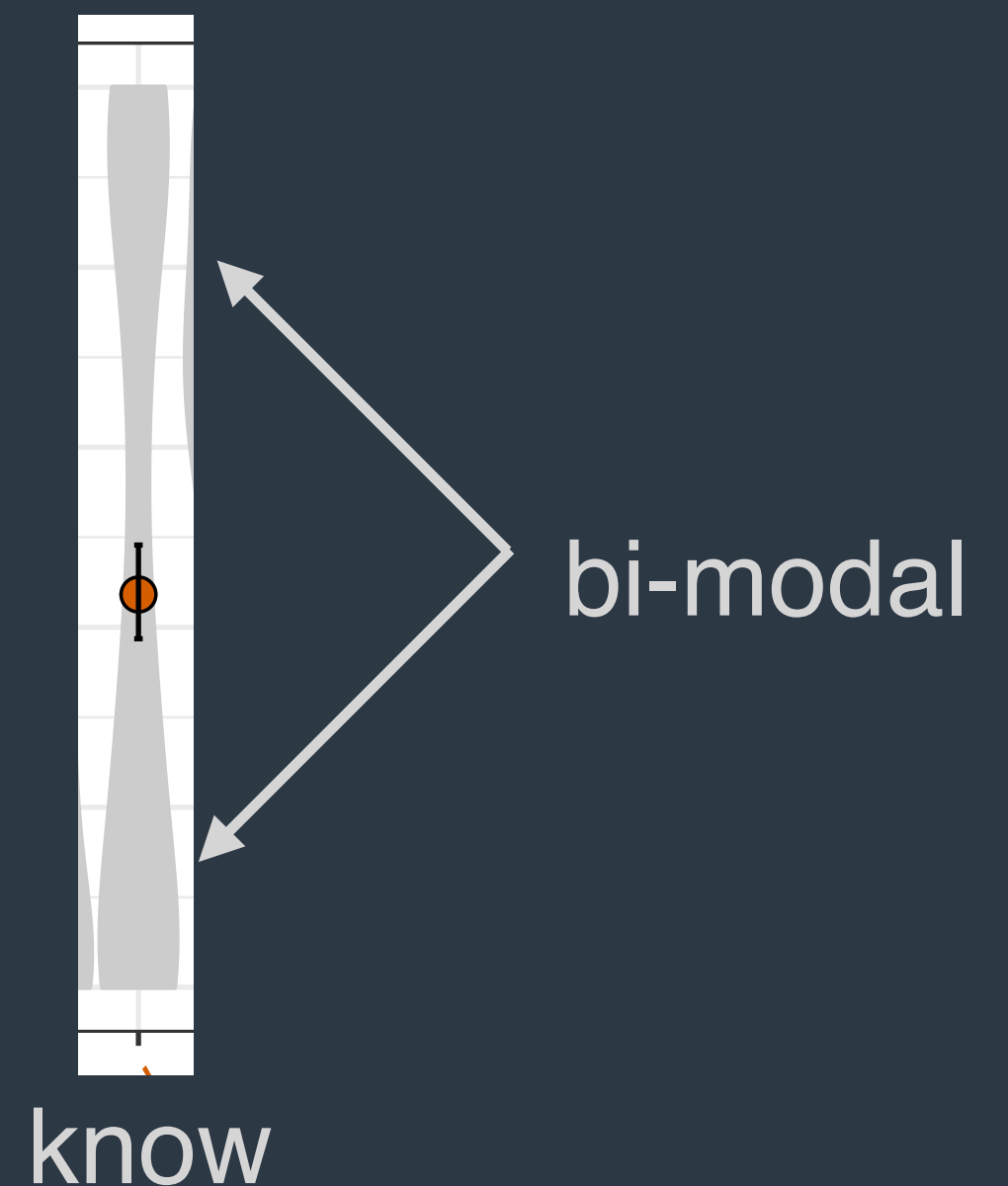
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Scott: “I don’t know if Julian dances salsa. QUD: Does Julian dance salsa?  
Does Cole know that Julian dances salsa?”  
L\*+H L-H%

- Hypothesis: Implicit rise-fall-rise prosody conveys that the polar question does not provide a complete answer to the QUD, and hence is not interpreted as conveying speaker belief in the content of the complement. (e.g., Ward & Hirschberg 1985, Wagner et al 2013)



## Summary of the experiment

- We agree with Mandelkern et al 2020:497, who advocate for “a two-pronged approach” (inference rating and naturalness rating tasks).
- Naturalness ratings of clause-embedding predicates in explicit ignorance contexts do not support a categorical distinction between factive and nonfactive predicates, just like inference ratings don’t.
- Naturalness ratings again suggest that projection models need to incorporate “meaning distinctions between clause-embedding predicates that are more fine-grained than factivity” (Degen & Tonhauser 2022:552).



Which lexical representations of clause-embedding predicates make empirically adequate predictions in models of projection inferences?

- There is, currently, no empirical support for a class of “factive” predicates that is categorically distinct from nonfactive ones.
- It is worthwhile continuing to search for such support, but we should also not lose sight of investigating how more fine-grained lexical meaning differences modulate projection inferences.



ADDITIONAL SLIDES

# Naturalness (and inference) ratings are sensitive to prior probability of content

Scott: “Julian is Cuban/German. Did Cole say that Julian dances salsa?”

