

Higher-probability content is more projective than lower-probability content

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What do we take speakers to be committed to?

Sally: “*Does Kim know that Sam has a new hat?*”

Sally may be taken to be committed to the truth of the content of the complement (CC), that Sam has a new hat

CC of *know* is projective content (e.g., a “presupposition”)

Long-standing research question:

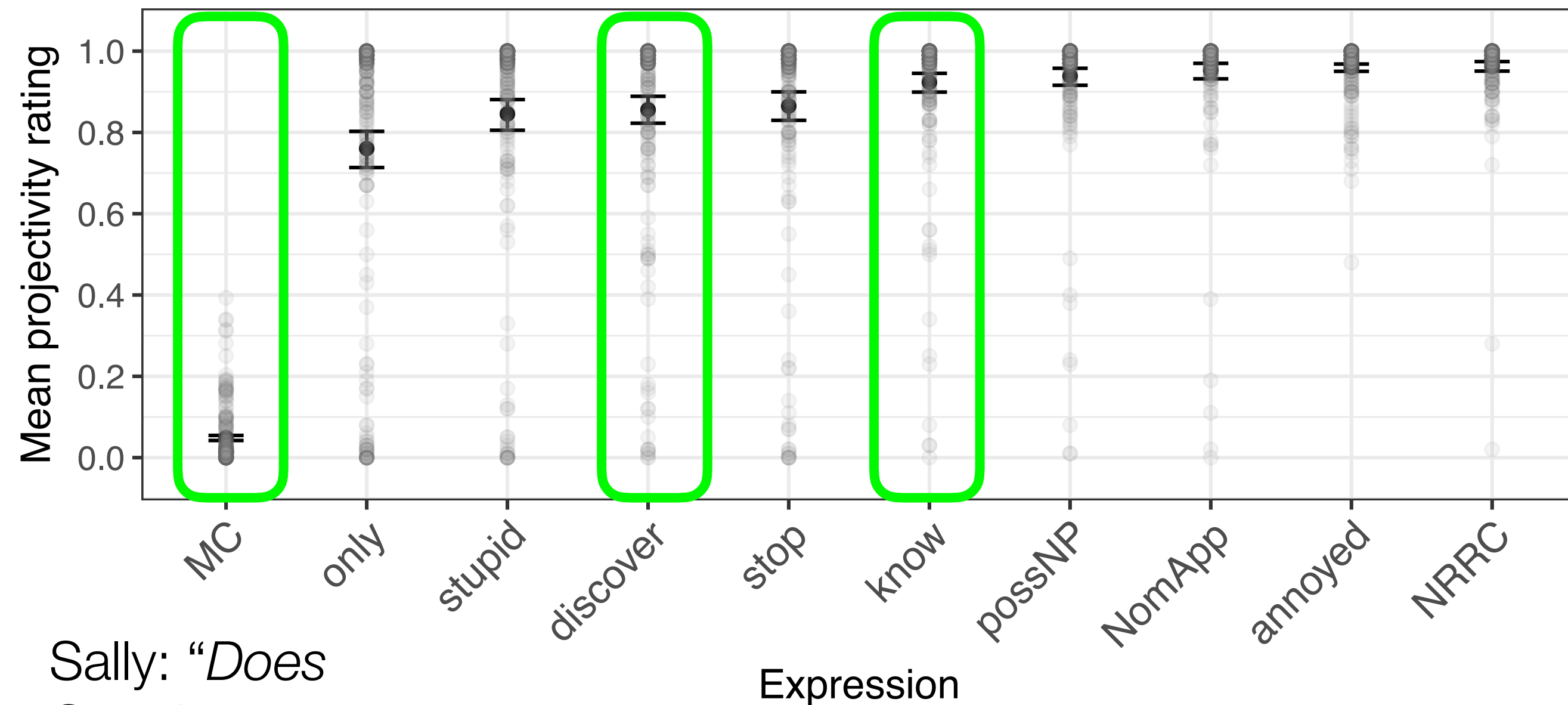
Which factors constrain whether listeners take speakers to be committed to a content, i.e., whether that content projects?

Karttunen 1971, 1973; Kiparsky & Kiparsky 1971; Gazdar 1979; Karttunen & Peters 1979; Heim 1983; Kadmon 2001; Simons 2001; Abrusán 2011; i.a.

Predicate: CC of *know* more projective than *discover*

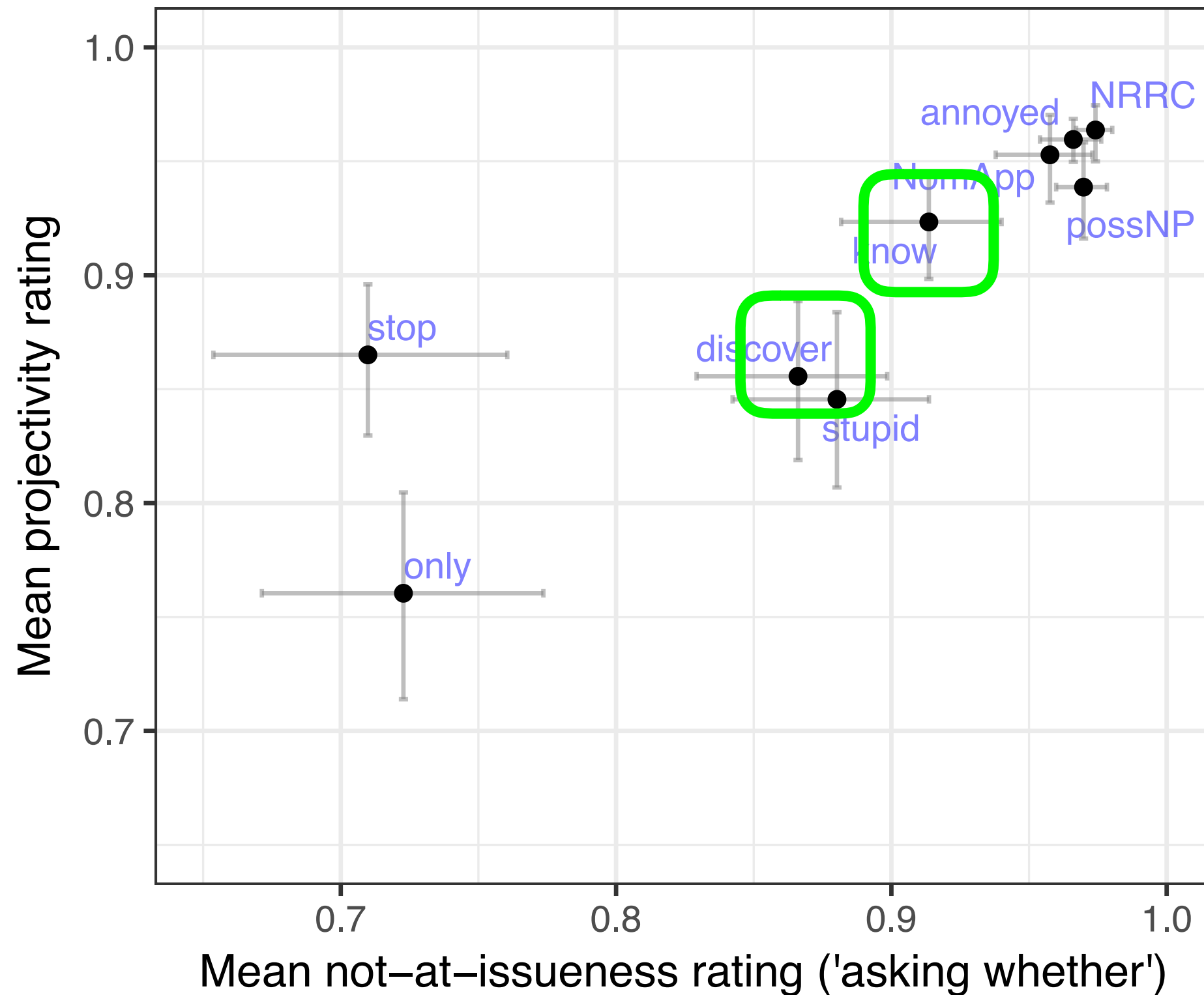
Sally: “Does Kim **know** ...that Sam has a new hat?”

“Did Kim **discover**... *



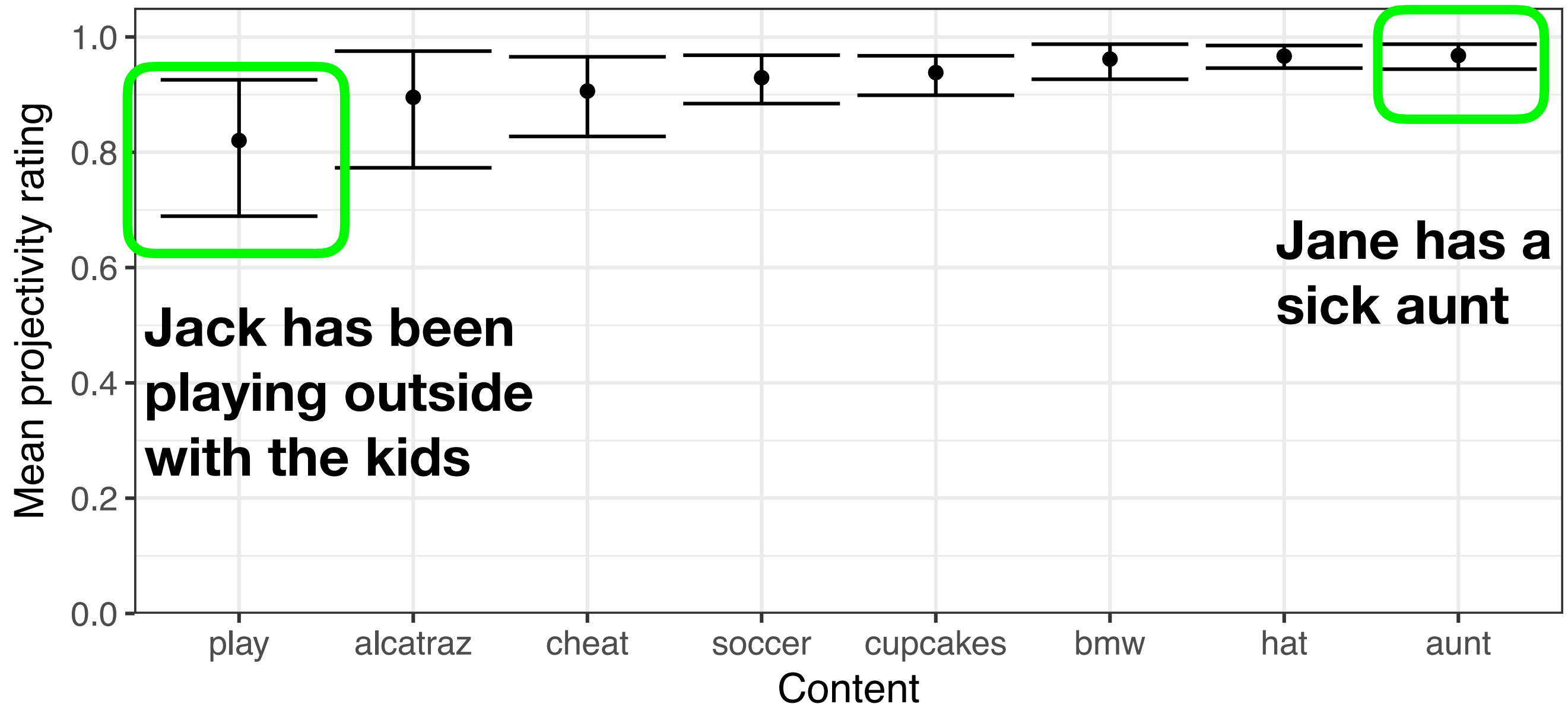
Sally: “Does Sam have a new hat?”

At-issueness: More not-at-issue content is more projective



Some lexical content is more projective than other

Sally: “*Does Kim know that...?*”



Hypothesis from Tonhauser, Beaver & Degen 2018: 500

Content is more projective the higher its prior probability.

Materials

400 polar questions

Sally: “*Does Kim know that Julian dances salsa?*”

- 20 clause-embedding predicates: e.g., *know, discover, ...*
- 20 clausal complements: e.g., *Julian dances salsa, ...*

Manipulation of prior probability of content of complement (CC)

1. Higher prior probability fact: Julian is Cuban
2. Lower prior probability fact: Julian is German

800 combinations of a polar question and a fact

20 clause-embedding predicates

		Projective	
		no	yes
Entailed	yes	<div><div>'non-factive'</div><div>demonstrate be right</div></div>	<div><div>'factive'</div><div>be annoyed know see discover reveal</div></div>
	no	<div><div></div><div>pretend think suggest say</div></div>	<div><div></div><div>inform hear acknowledge admit confess announce establish confirm prove</div></div>

Tonhauser & Degen
ms challenge the
categorical notion
of factivity

Manipulation of prior probability of content of complement

20 CCs (e.g., Julian dances salsa); higher and lower prior probability facts

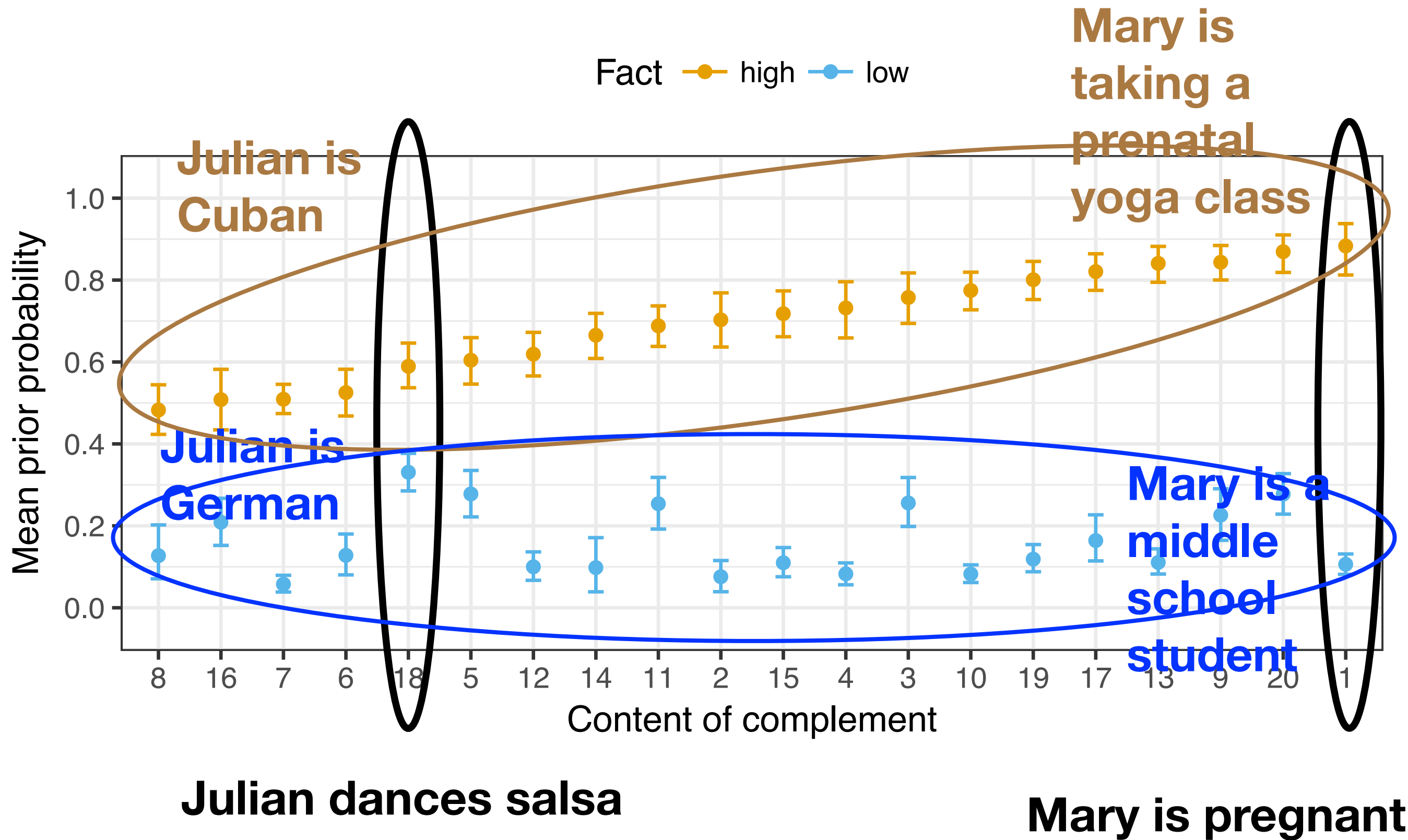
Norming study with participants recruited on AMT platform

The screenshot shows a survey interface with the following elements:

- A blue-bordered box containing the text "Fact: Julian is German." with a blue arrow pointing to it from the label "lower probability fact".
- A black-bordered box containing the text "How likely is it that Julian dances salsa?" with a black arrow pointing to it from the label "content of complement".
- A horizontal slider bar with "impossible" on the left and "definitely" on the right.
- A "Continue" button at the bottom.

Each participant assessed each of the 20 CCs with one of the two facts, as well as 2 control items.

Prior probability of content of complement influenced by fact



Ratings from 75 participants

Projectivity experiment

800 combinations of a polar question (predicate + CC) and a fact

The screenshot shows a web-based experiment interface. It consists of two main sections, each enclosed in a green rounded rectangle. The top section contains two lines of text. The first line is "Fact (which David knows): Julian is German.", where "Julian is German." is highlighted with a blue rounded rectangle. A blue arrow points from the text "lower probability fact" to this blue box. The second line is "David asks: 'Did Kathleen confirm that Julian dances salsa?'", where "confirm" is highlighted with a red rounded rectangle (labeled "predicate" in red text below it) and "Julian dances salsa" is highlighted with a black rounded rectangle. A black arrow points from the text "content of complement" to this black box. The bottom section contains the question "Is David certain that Julian dances salsa?" followed by a horizontal slider with "no" on the left and "yes" on the right. Below the slider is a "Next" button.

Fact (which David knows): Julian is German.

David asks: "Did Kathleen confirm that Julian dances salsa?"

predicate

Is David certain that Julian dances salsa?

no yes

Next

lower probability fact

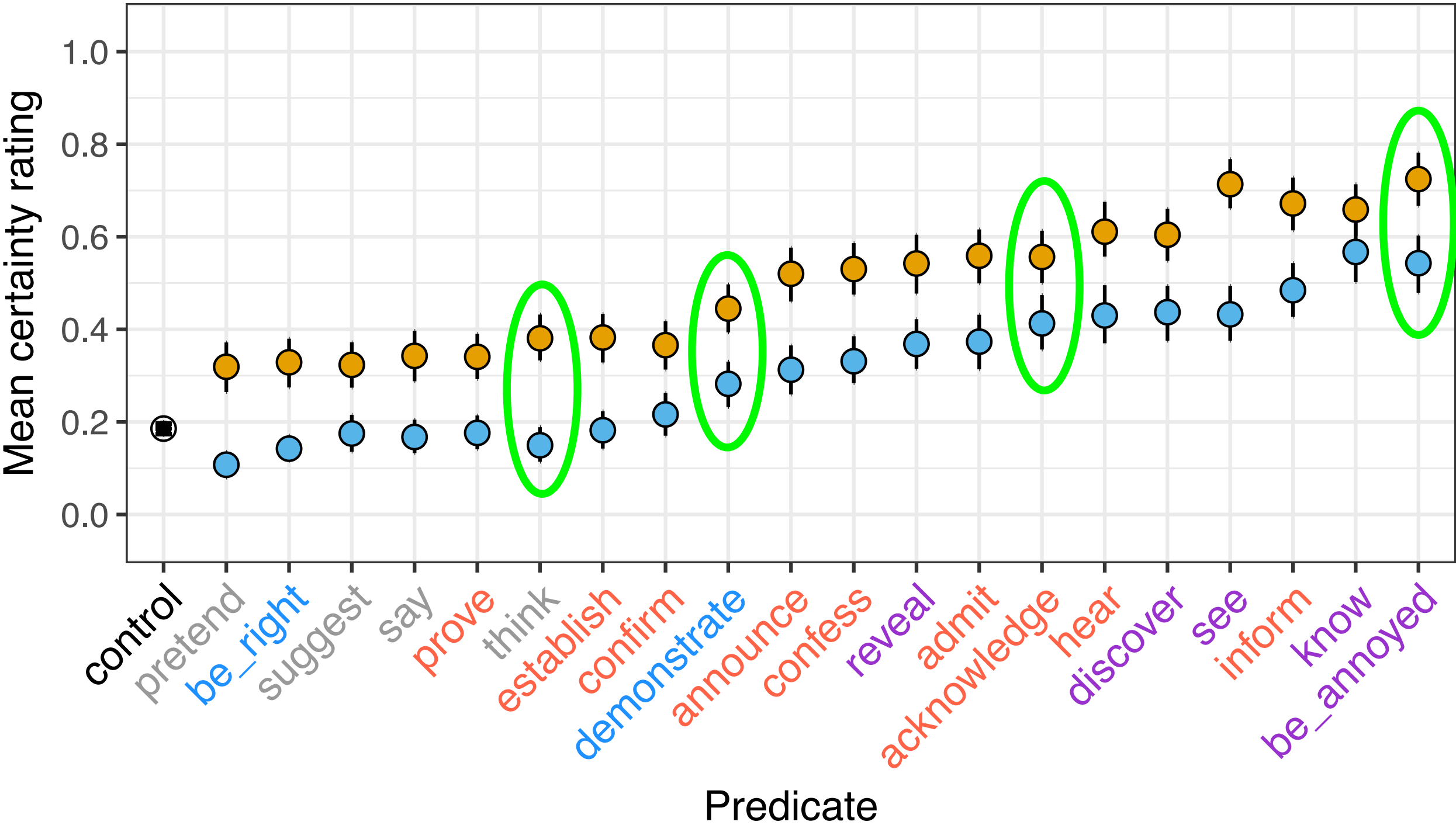
content of complement

Each participant rated 20 items with one of the 20 predicates (each with a unique CC) and 6 main clause control items.

Higher-probability CCs more projective than lower-probability CCs

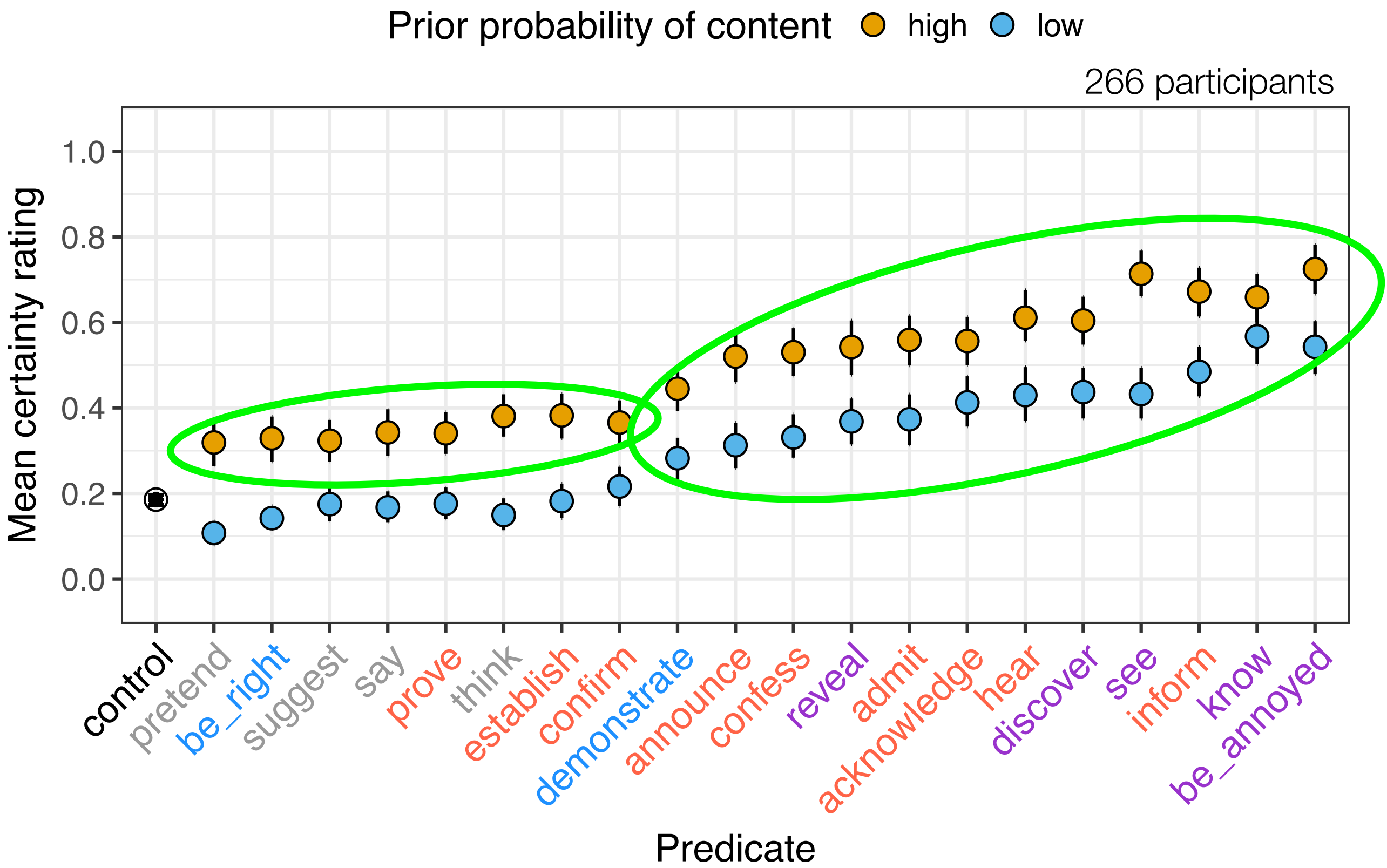
Prior probability of content ● high ● low

266 participants



LMEM predicting rating from prior probability mean and predicate; random effects for participant and item; by-participant slope for prior probability ($\beta = .34$, $SE = .03$, $t = 13.5$, $p < .0001$)

CCs of all 20 predicates projective, albeit to varying degrees



LMEM predicting rating from predicate/fact, with controls as reference level; random effects for participant and item

Summary of findings

1. Content is more projective the higher its prior probability, confirming Tonhauser, Beaver & Degen's 2018 hypothesis.
2. The content of the complement of all 20 predicates is projective, albeit to varying degrees.

Theoretical implications

1. Content is more projective the higher its prior probability, confirming Tonhauser, Beaver & Degen's 2018 hypothesis.

Do analyses of projective content predict this finding?

Lexicalist analyses (e.g., Heim 1983, van der Sandt 1992)

- limited to factive predicates

Sally: *“Did Sam **discover** / **admit** that Julian dances salsa?”*

- CC of factive predicates is not globally accommodated when it is inconsistent with the common ground.
- The finding could perhaps be captured if lower prior probability CCs are “more inconsistent” with the common ground.

Theoretical implications

1. Content is more projective the higher its prior probability, confirming Tonhauser, Beaver & Degen's 2018 hypothesis.

Do analyses of projective content predict this finding?

Pragmatic analyses (e.g., Abrusán 2011, 2016; Simons et al 2017)

- limited to predicates whose CC is entailed

Sally: *“Did Sam **discover** / **admit** that Julian dances salsa?”*

- If CC is at-issue in discourse context, it does not project.
- The finding can be captured if lower prior probability CCs can be assumed to be more likely to be at-issue.

Theoretical implications

1. Content is more projective the higher its prior probability, confirming Tonhauser, Beaver & Degen's 2018 hypothesis.

Do analyses of projective content predict this finding?

Prior probability matters (Tonhauser, Degen, de Marneffe & Simons submitted)

- Non-redundancy principle: The more the truth of utterance content c is taken to follow from the common ground, the less likely it is at-issue, i.e., the more likely it is to project.
- The truth of higher prior probability CCs is more likely to be taken to follow from the common ground
- Therefore, higher prior probability CCs are less likely to be at-issue, i.e., predicted to be more projective.

Theoretical implications

2. The content of the complement of all 20 predicates is projective, albeit to varying degrees.

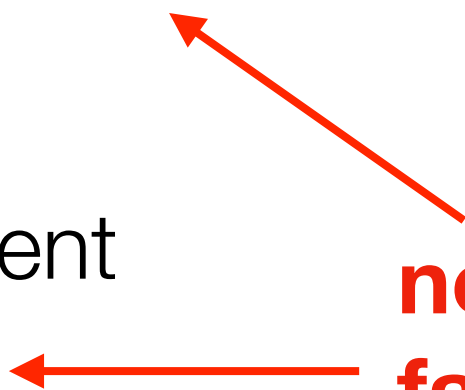
Analyses limited to factive or entailed CCs do not predict this finding because they only apply to a subset of predicates.

Tonhauser et al (2018, submitted) consider utterance content more generally, i.e., also predict the projectivity of non-entailed content.

To predict the by-predicate differences, analyses need to consider how the meaning of the predicate contributes to projection.

Long-standing research question:

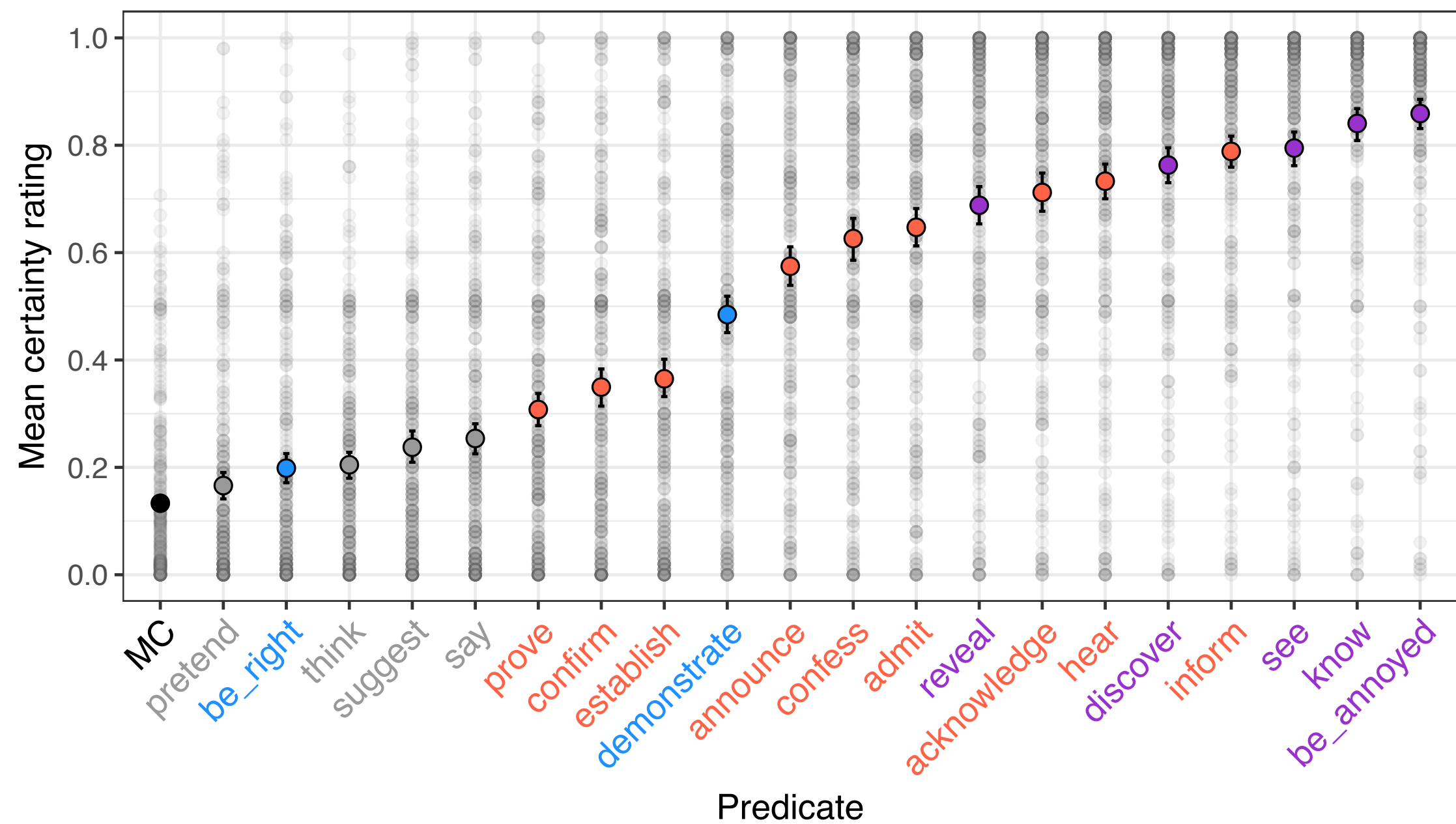
Which factors constrain whether listeners take speakers to be committed to a content, i.e., whether that content projects?

- Lexical meaning of expression associated with the content
 - At-issueness of the content
 - Information structural status of the content
 - Prior probability of the content
- not just
factive CCs!**
- 

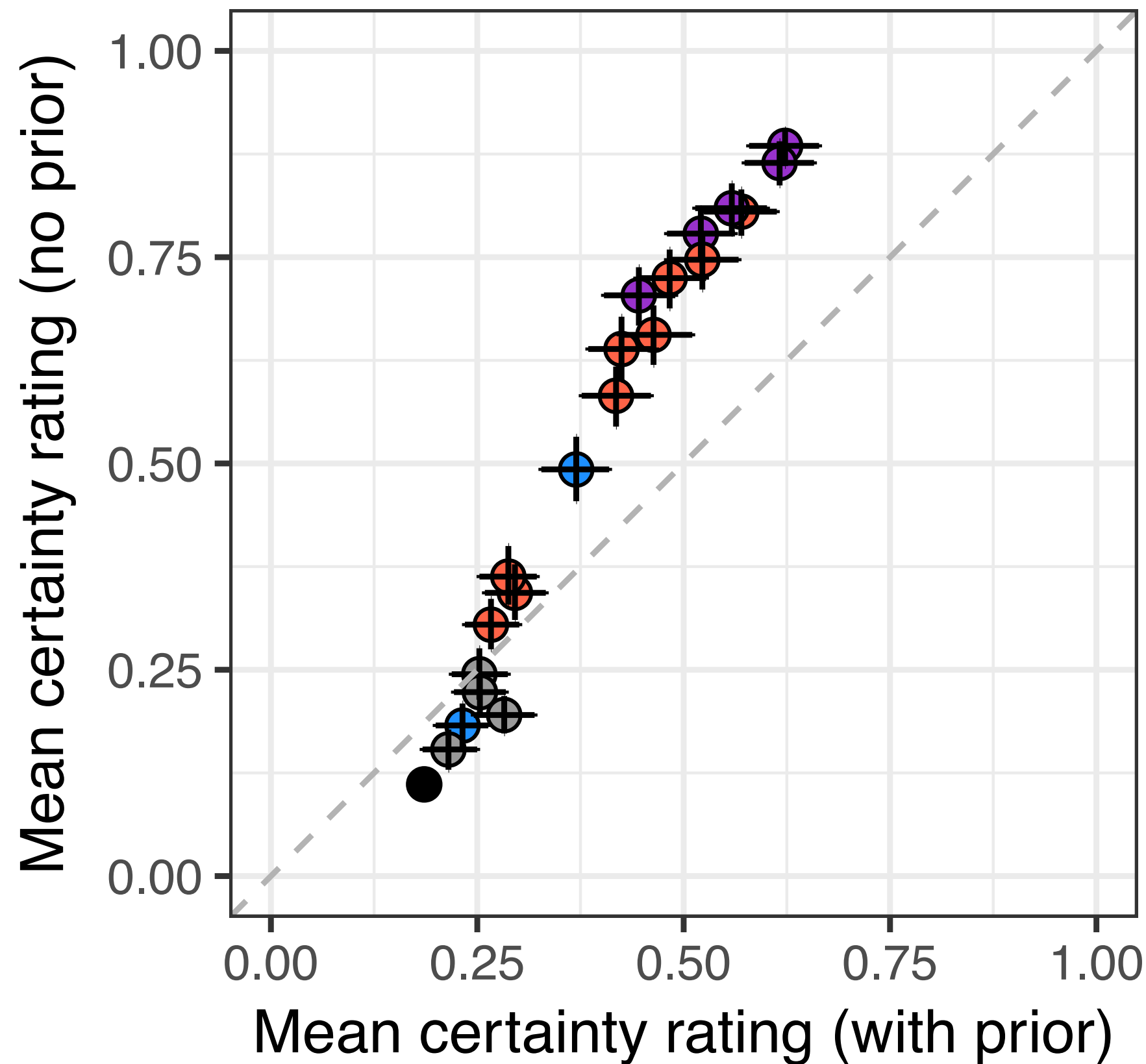
e.g., Tonhauser 2016; Djärv & Bacovcin 2017; Stevens et al 2017; Tonhauser, Beaver & Degen 2018; de Marneffe et al 2019; Tonhauser et al 2019

Analyses of projective content must derive projection from the integration of multiple factors. How these factors are best integrated is an exciting question for future research.

Projection without manipulation of prior probability



Comparing projectivity ratings



**Spearman's
rank
correlation**
n = 20
rs = .983

At-issueness predicts projectivity

(Tonhauser, Beaver & Degen 2018)

