



Not (just) any licensors cause negative polarity illusions

Hanna Muller, Iria de Dios Flores, Colin Phillips



Question

- Systematic failures to accurately represent certain types of sentences can illuminate the processes by which those representations are constructed
- NPI illusions are one such systematic failure - their cause may lie in the nature of the dependency being processed



Basic Phenomenon

NPI = Negative Polarity Item, e.g. *ever, any, lift a finger, give a damn, in years*

NPIs' defining characteristic is their **limited distribution**:

- (1) I **don't** think Mary has *ever* been to Paris.
- (2) * I think Mary has *ever* been to Paris.



Basic Phenomenon

NPIs require not just a licenser in the sentence, but a licenser in a syntactically appropriate position

(3) I think the students [that read the paper] **haven't** thought about it *in years*.

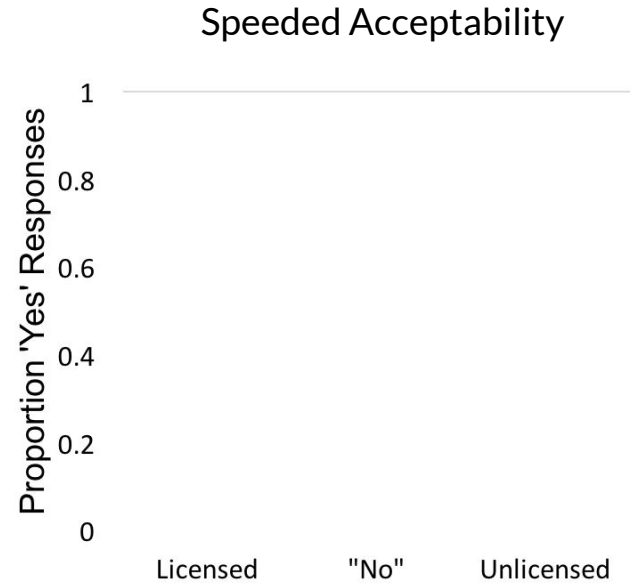
(4) I **don't** think the students [that read the paper] have thought about it *in years*.

(5) * I think the students [that **didn't** read the paper] have thought about it *in years*.



Basic Phenomenon

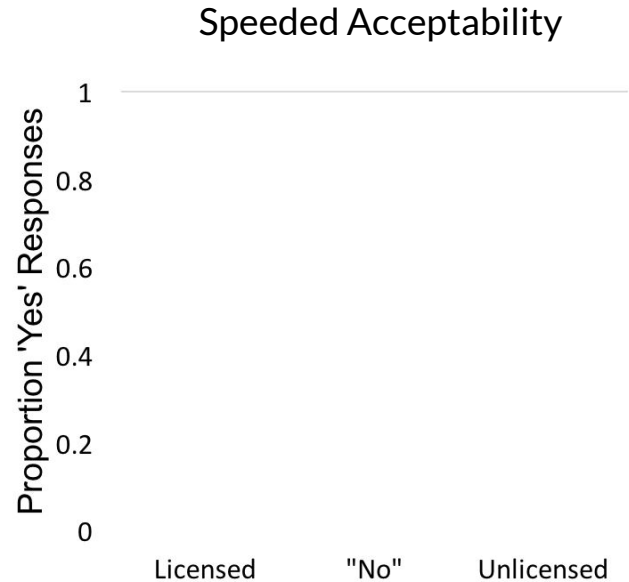
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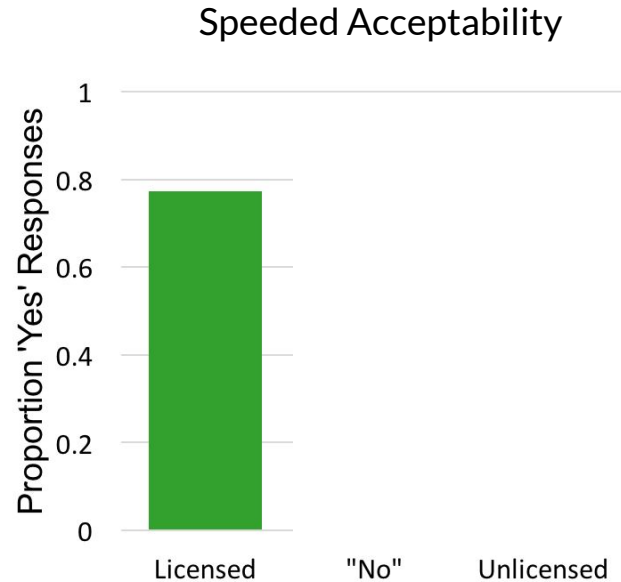
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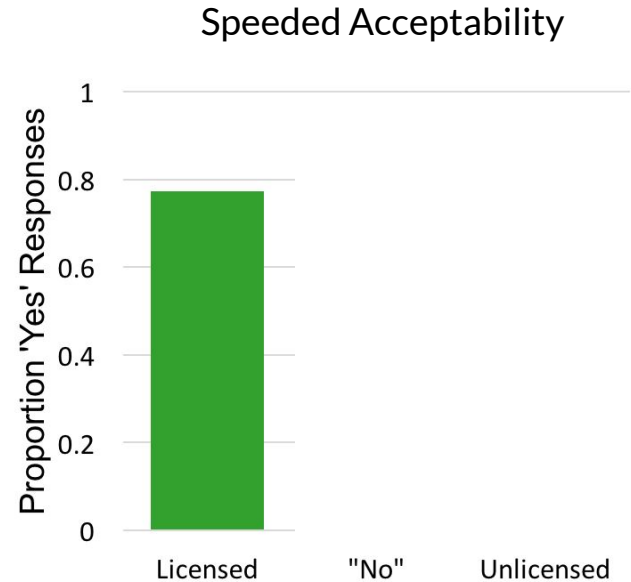


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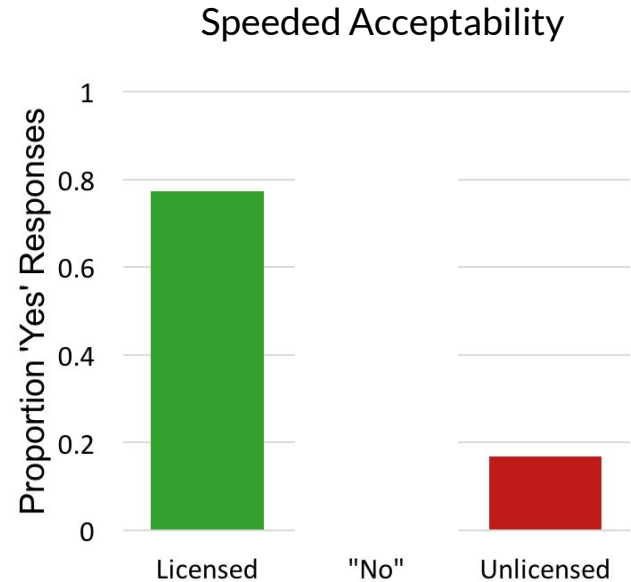


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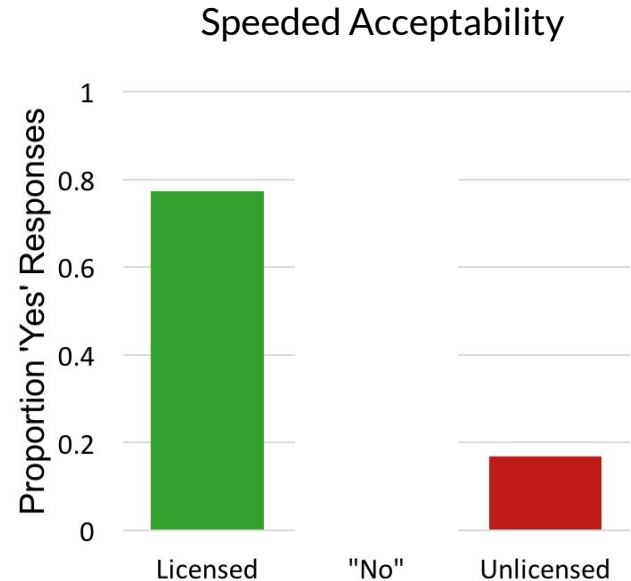
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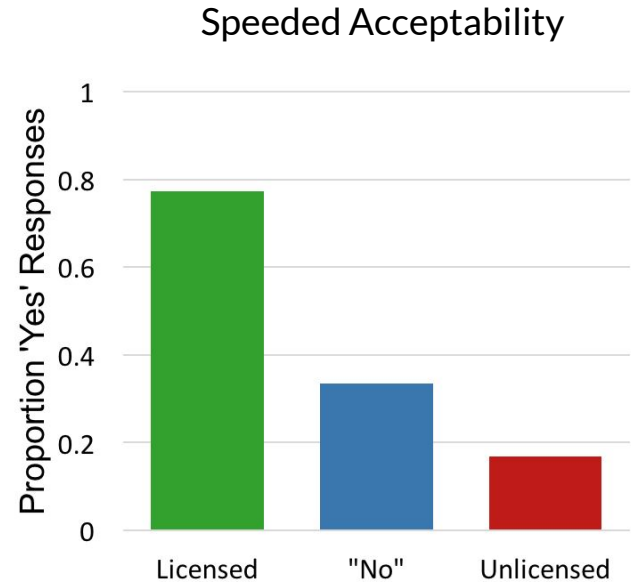
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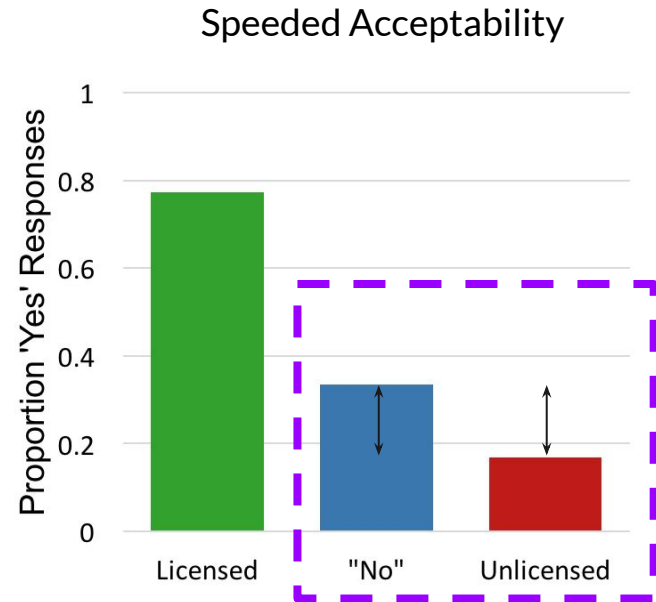
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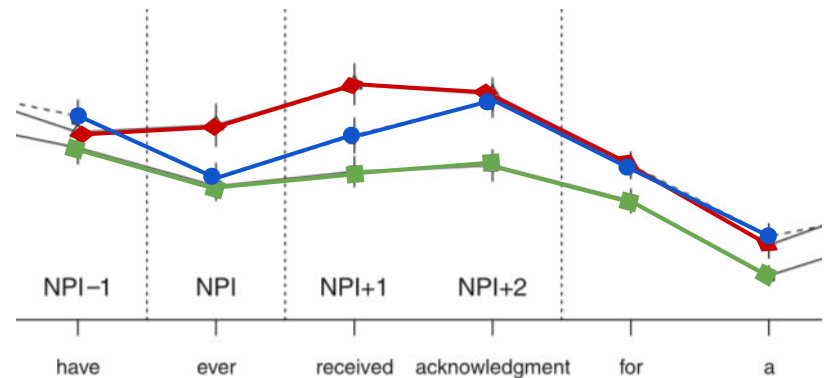
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Reading Times



Basic Phenomenon

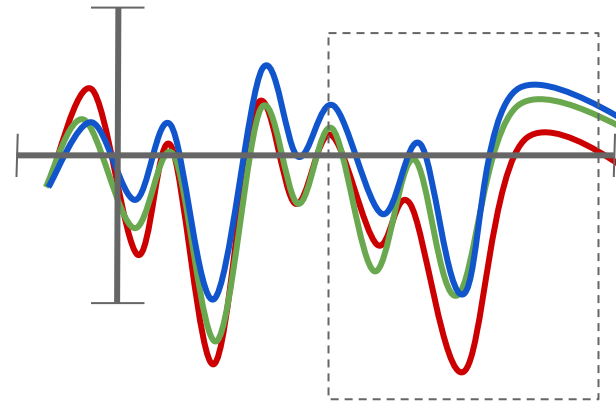
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ERPs





Why do NPI illusions arise?

- Mistaken retrieval of a non-c-commanding licensor (Drenhaus, Saddy, & Frisch 2005; Vasishth, Brussow, Lewis, & Drenhaus 2008)
- Covert exhaustification operator (Mendia, Poole, & Dillon 2018)
- Wide-scoping interpretations of the negative quantifier (de Dios Flores, Muller, & Phillips 2017; Orth, Yoshida & Sloggett 2019)
- Negative inferences driven by pragmatic constraints on the use of relative clauses (Xiang, Dillon, & Phillips 2009; Xiang, Grove, & Giannakidou 2013)



Proposal - item to item dependency

(6) No authors that the critics recommended have



Proposal - item to item dependency

(6) No authors that the critics recommended have *ever*



Proposal - item to item dependency

(6) No authors that the critics recommended have *ever*



Proposal - item to item dependency

(6) **No** authors that the critics recommended have *ever*



Proposal - item to item dependency

(6) **No** authors that the critics recommended have *ever* written ...



Proposal - item to context dependency

(6) No authors that the critics recommended have



Proposal - item to context dependency

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(6) No authors that the critics recommended have ever



Proposal - item to context dependency

(6) *No authors that the critics recommended have ever*



Proposal - item to context dependency

(6) No authors that the critics recommended have ever written ...



Proposal - item to context dependency

(6) No authors that the critics recommended have ever written a best-selling novel.



Proposal - item to context dependency

(6) No authors that the critics recommended have ever written a best-selling novel.

(7) The authors that **no critics recommended**



Proposal - item to context dependency

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Proposal - item to context dependency

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(6) No authors that the critics recommended have ever written a best-selling novel.

(7) The authors that **no critics recommended** have *ever*



Proposal - item to context dependency

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- I'll argue that the online processing of NPIs relates the NPI to its surrounding context, and illusions arise when a nearby but non-surrounding context selected



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- This is not the same as a syntactic mis-parse



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- I'll argue that the online processing of NPIs relates the NPI to its surrounding context, and illusions arise when a nearby but non-surrounding context selected
- This is not the same as a syntactic mis-parse
- If this is right, we expect added distance from the RC to the NPI to kill the illusion and we might expect that properties of the RC that suggest NPI-friendly meanings (beyond the mere presence / absence of negation) will influence NPI illusions



Outline

1. Basic NPI illusions
2. Phenomenon 1: the distance effect
 - a. Experiment 1 - prepositional phrases
 - b. Experiment 2 - verbs
3. Phenomenon 2: the licenser effect
 - a. Experiment 1 - *no* vs *haven't*
 - b. Experiment 2 - *no* vs *did not*
 - c. Experiment 3 - *very few* vs *haven't* in SRCs
 - d. Experiment 4 - *no* vs *haven't* vs *haven't...any*
4. Complications



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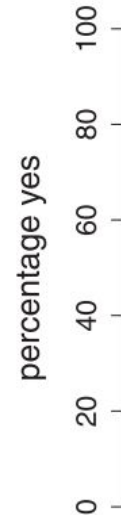


NPI illusion data - Parker & Phillips 2016

(11) **No** journalists [that the editors recommended for the assignment] *ever* thought that the readers would understand the complicated situation.

(12) *The journalists [that **no** editors recommended for the assignment] *ever* thought that the readers would understand the complicated situation.

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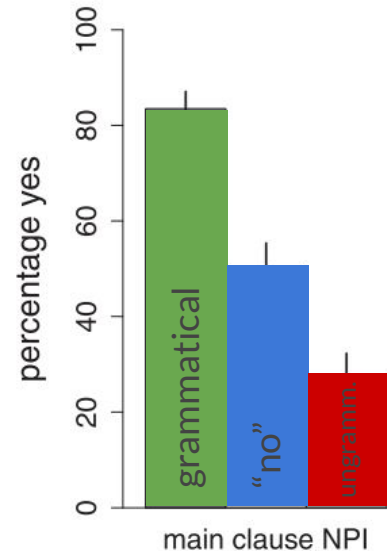


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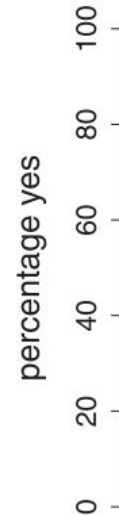


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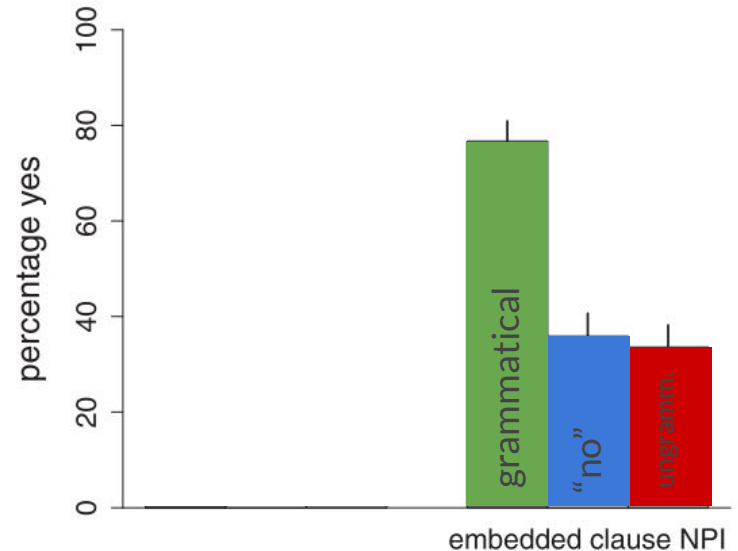


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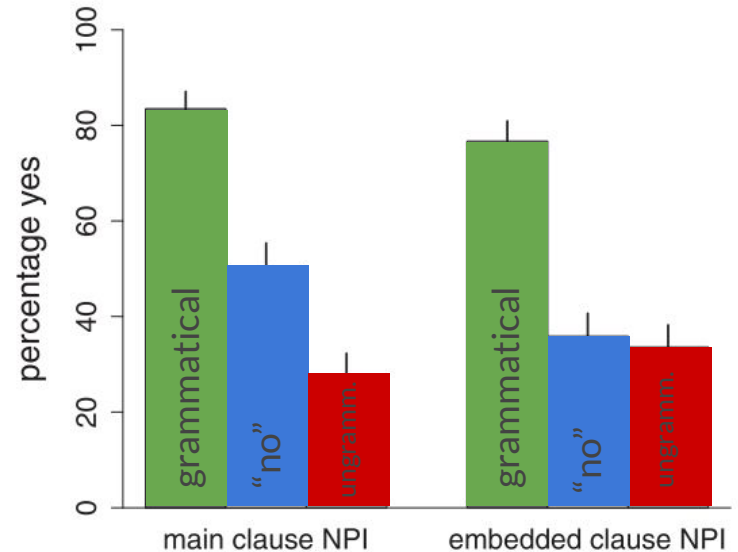


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(17) **No** journalists [that the editors recommended for the assignment] (*ever*) thought that the readers would (*ever*) understand the complicated situation.

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Which distance?

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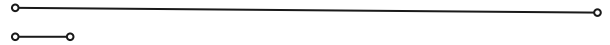
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Distance Experiment 1

(20) *The journalists [that **no** editors recommended **for the assignment**] (*ever*) thought that the readers would understand the complicated situation.

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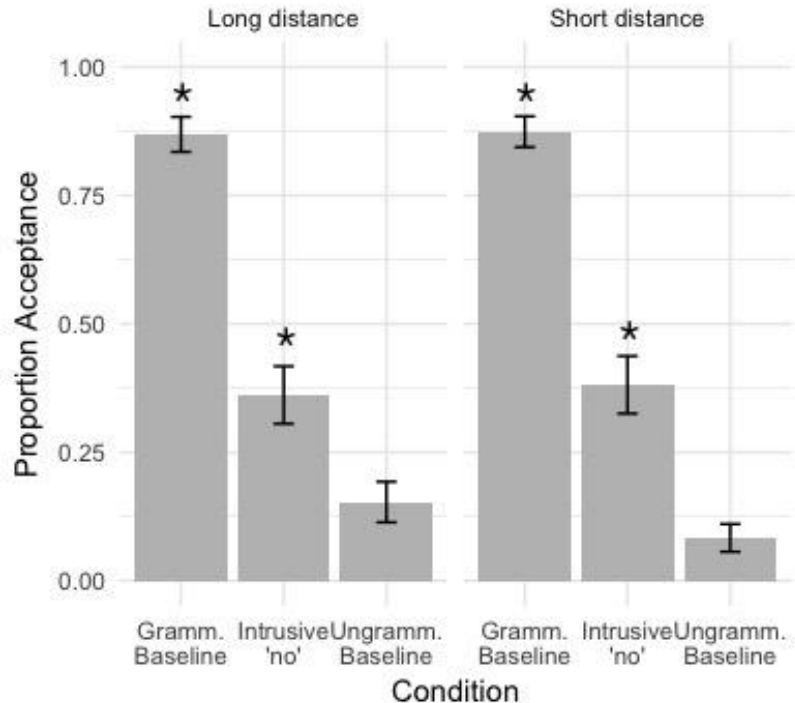


Distance Experiment 1

- (a) No politicians [that the journalists have endorsed (in the media)] have ever earned trust from the rural communities.
- (b) *The politicians [that no journalists have endorsed (in the media)] have ever earned trust from the rural communities.
- (c) *The politicians [that the journalists have endorsed (in the media)] have ever earned trust from the rural communities.

Distance Experiment 1

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Distance effect (Parker & Phillips 2016)

Is a PP not enough added distance?

Parker & Phillips found that just a verb is enough

(22) No/The surgeons [that no/the patients have trusted] have **healed any** injuries with experimental medications.

(23) No/The surgeons [that no/the patients have trusted] have **ever healed** the injuries with experimental medications.



Distance Experiment 2

(a-c) No/The surgeons [that **no**/the patients trusted] have *ever* prescribed new experimental medications.



Distance Experiment 2

(a-c) No/The surgeons [that **no**/the patients trusted] have **ever** prescribed new experimental medications.

(g-i) No/The surgeons [that **no**/the patients have trusted] have **healed any** injuries with experimental medications.



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(a-c) No/The surgeons [that **no**/the patients trusted] have **ever** prescribed new experimental medications.

(d-f) No/The surgeons [that **no**/the patients trusted **to heal their injuries**] have **ever** prescribed new experimental medications.

(g-i) No/The surgeons [that **no**/the patients have trusted] have **healed any** injuries with experimental medications.



Distance Experiment 2

short

(a-c) No/The surgeons [that **no**/the patients trusted] have **ever** prescribed new experimental medications.

short

(d-f) No/The surgeons [that **no**/the patients trusted **to heal their injuries**] have **ever** prescribed new experimental medications.

long

(g-i) No/The surgeons [that **no**/the patients have trusted] have **healed any** injuries with experimental medications.



Distance Experiment 2

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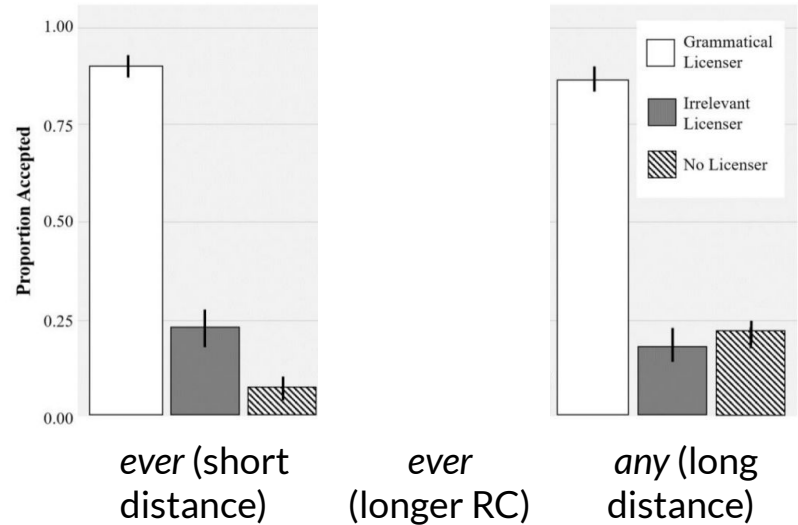
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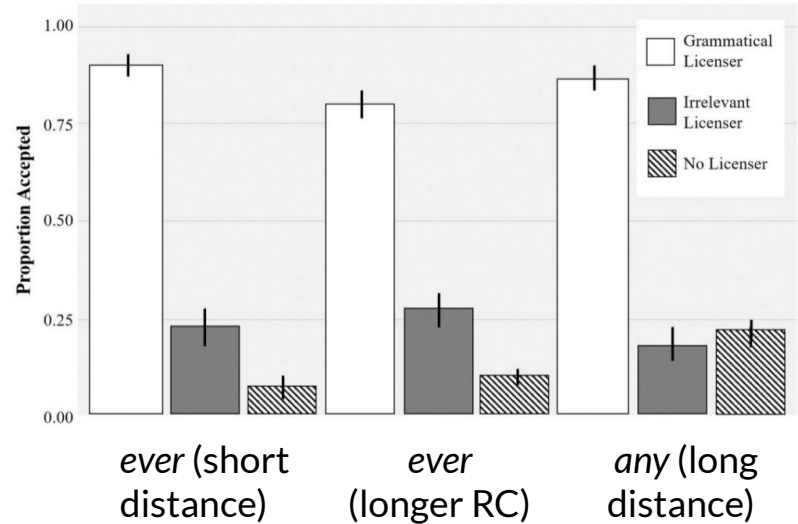


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 - a. Experiment 1 - prepositional phrases
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3. Complications



NPI licensors

Why would the wrong context ever be chosen?



NPI licensors

Why would the wrong context ever be chosen?

Differences in the NPI-friendliness of the RC should lead to differences in illusion rates



Negative quantifiers

Negative quantifiers seem to signal strong negative commitments or exceptionless claims



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NPIs have been argued to function as strengtheners (i.e. they indicate a lack of exceptions along some dimension)



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NPIs have been argued to function as strengtheners (i.e. they indicate a lack of exceptions along some dimension)

Simple sentential negation *didn't* may not signal the same strong exceptionless negative claims, though it's a perfectly good licenser

So if the strength of the claim matters, *no* clauses should be more NPI-friendly than *not* clauses



Negative quantifiers vs sentential negation

COCA query	Frequency of <i>ever</i> per 5000 sentences
[No]	59 (1.18%)
[Not] / [n't]	12 (0.24%)



Negative quantifiers

(24) The authors [that **no** critics have recommended for the award] have *ever* received acknowledgement for a best-selling novel.

(25) The authors [that the critics **haven't** recommended for the award] have *ever* received acknowledgement for a best-selling novel.



Licensor experiment 1

- (a) **No** authors [that the critics have recommended for the award] have *ever* received acknowledgement for a best-selling novel.
- (b) The authors [that **no** critics have recommended for the award] have *ever* received...
- (c) The authors [that the critics **haven't** recommended for the award] have *ever* received...
- (d) The authors [that the critics have recommended for the award] have *ever* received...

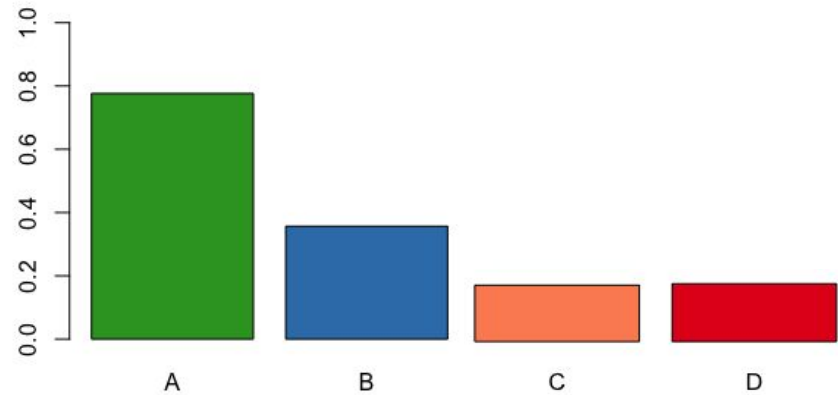
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Licensor experiment 2

Maybe you don't see illusions for *haven't* because negation is phonologically reduced / not salient.

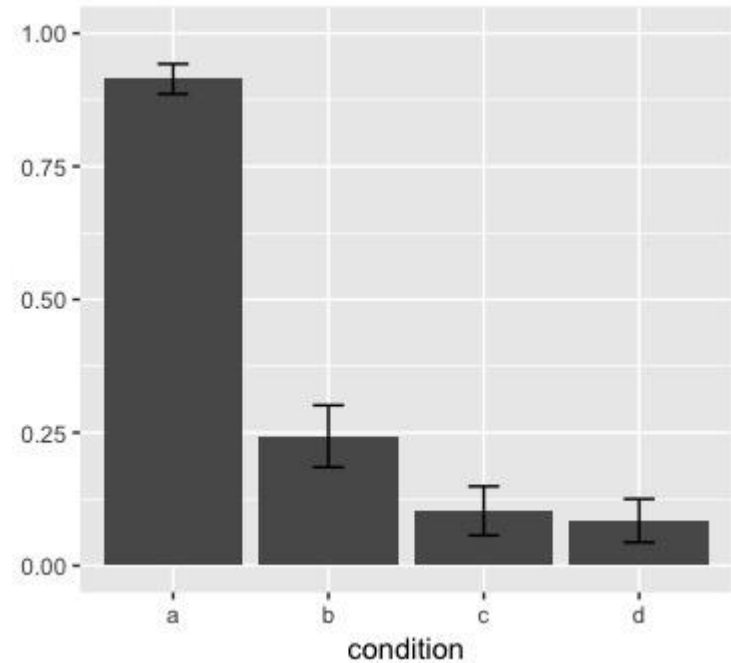


Licensors experiment 2

- (a) **No** authors that the critics recommended have ever received acknowledgment for a best-selling novel.
- (b) The authors that **no** critics recommended have ever received ...
- (c) The authors that the critics **did not** recommend have ever received ...
- (d) The authors that the critics recommended have ever received ...

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- (d) The authors that the critics recommended have ever received ...





Licensor experiment 3

Maybe you don't see illusions with *haven't* and *did not* because they're structurally lower than a negative quantifier, so they're more nodes away from c-commanding it.

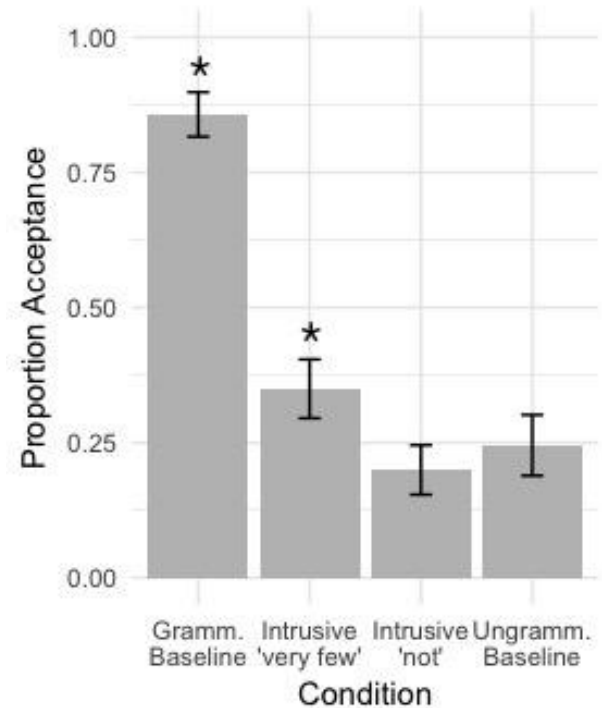


Licensor experiment 3

- (a) **Very few** critics that have recommended the authors of alternative genres have ever objected to mainstream literary trends.
- (b) *The critics that have recommended **very few** authors of alternative genres have ever objected ...
- (c) *The critics that **haven't** recommended the authors of alternative genres have ever objected ...
- (d) *The critics that have recommended the authors of alternative genres have ever objected ...

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Quantifier scope

Could the licensor contrast be attributed to the fact that quantifiers can take scope somewhere other than their surface position but sentential negation can't?



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Negative quantifiers *cannot* exceptionally scope out of a relative clause

That wouldn't explain the other data (like the distance effect)



Licensor experiment 4

I've claimed the relevant difference between *no* and *not* is actually about a difference in the meanings you get for clauses containing *no* vs the meanings you get for clauses containing *not*

If we could get a *no*-type meaning using the word *haven't* we would be able to tell if that's right



Licensor experiment 4

- (a) **No** critics that have recommended the authors of alternative genres have ever objected to mainstream literary trends.
- (b) *The critics that have recommended **no** authors of alternative genres have ever objected to mainstream literary trends.

- (e) *The critics that have recommended the authors of alternative genres have ever objected to mainstream literary trends.



Licensor experiment 4

- (a) **No** critics that have recommended the authors of alternative genres have ever objected to mainstream literary trends.
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- (e) *The critics that have recommended the authors of alternative genres have ever objected to mainstream literary trends.



Licensor experiment 4

- (a) **No** critics that have recommended the authors of alternative genres have ever objected to mainstream literary trends.
- (b) *The critics that have recommended **no** authors of alternative genres have ever objected to mainstream literary trends.
- (c) *The critics that **haven't** recommended the authors of alternative genres have ever objected to mainstream literary trends.
- (d) *The critics that **haven't** recommended **any** authors of alternative genres have ever objected to mainstream literary trends.
- (e) *The critics that have recommended the authors of alternative genres have ever objected to mainstream literary trends.



Licensor experiment 4

- (a) **No** critics that have recommended the authors of alternative genres have ever objected to mainstream literary trends.
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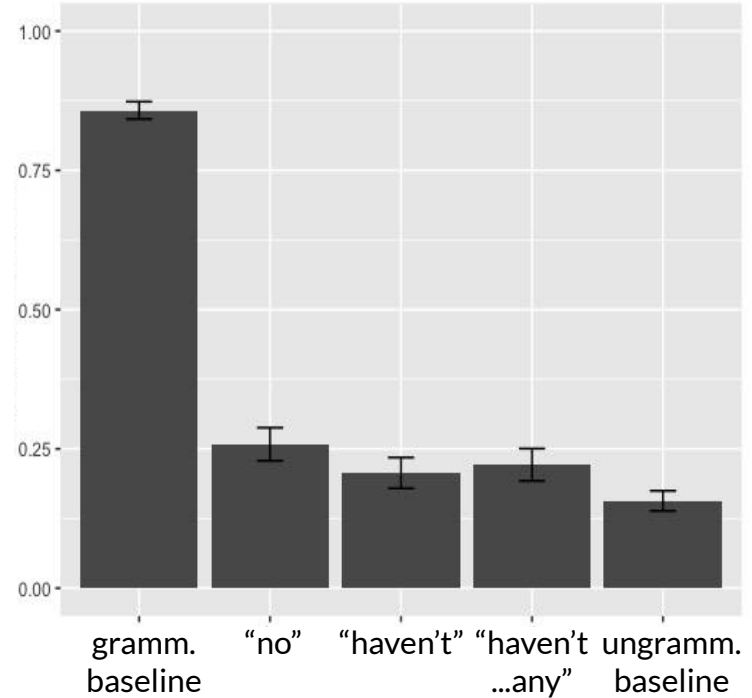


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- (d) *The critics that **haven't** recommended **any** authors of alternative genres have ever objected to mainstream literary trends.
- (e) *The critics that have recommended the authors of alternative genres have ever objected to mainstream literary trends.

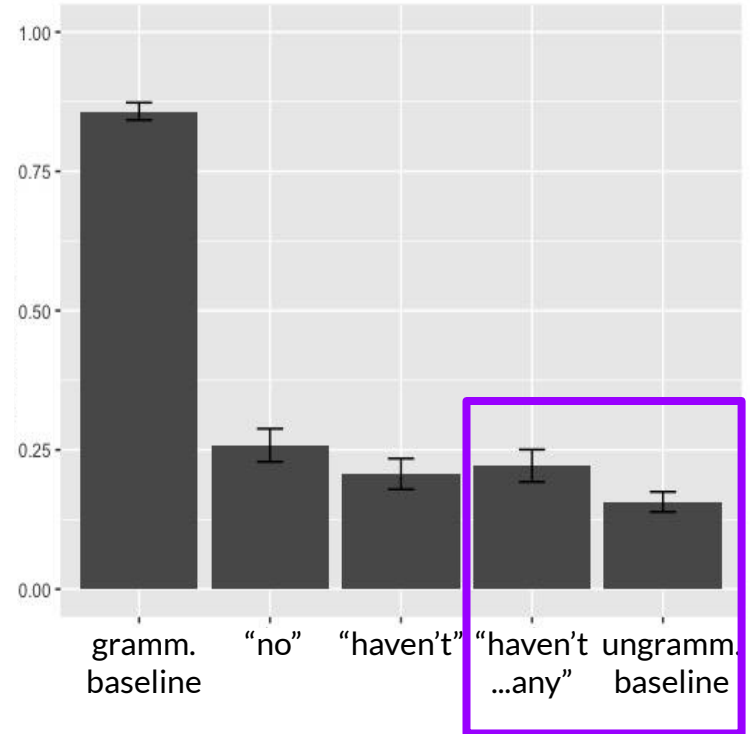
Licensor experiment 4

- (a) **No** critics that have recommended the authors of alternative genres have ever...
- (b) *The critics that have recommended **no** authors of alternative genres have ever...
- (c) *The critics that **haven't** recommended the authors of alternative genres have ever...
- (d) *The critics that **haven't** recommended **any** authors of alternative genres have ever...
- (e) *The critics that have recommended the authors of alternative genres have ever...



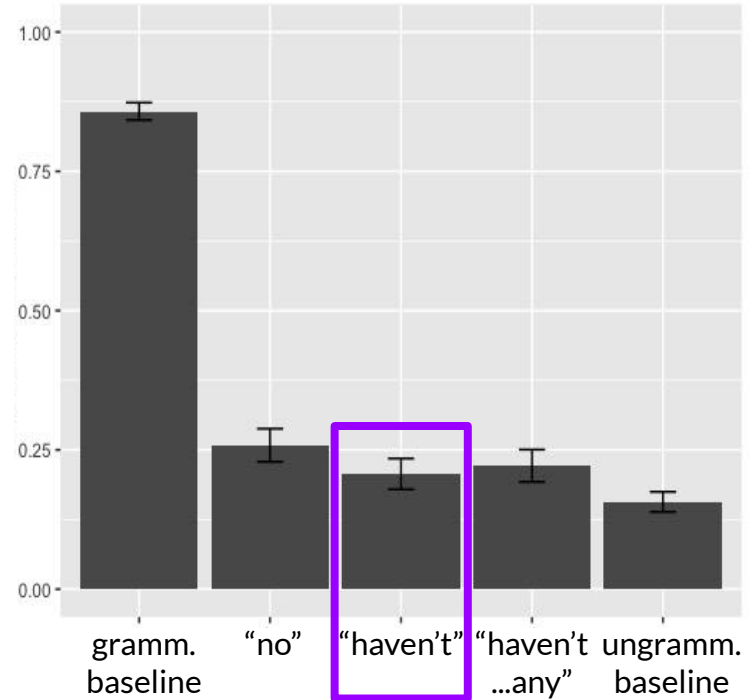
Licensors experiment 4

- (a) **No** critics that have recommended the authors of alternative genres have ever...
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- (d) *The critics that **haven't** recommended **any** authors of alternative genres have ever...
- (e) *The critics that have recommended the authors of alternative genres have ever...



Licensor experiment 4

- (a) **No** critics that have recommended the authors of alternative genres have ever...
- (b) *The critics that have recommended **no** authors of alternative genres have ever...
- (c) *The critics that **haven't** recommended the authors of alternative genres have ever...
- (d) *The critics that **haven't** recommended **any** authors of alternative genres have ever...
- (e) *The critics that have recommended the authors of alternative genres have ever...





What we've learned

- NPI illusions only arise when the NPI is sufficiently close to the licensing context.
- NPI illusions arise for negative quantifiers but not sentential negation.
- The licenser contrast does not reduce to a difference in phonological prominence, syntactic depth, or quantifier scope, but seems to be about the compositional meanings of clauses containing negative quantifiers.

These findings are consistent with the claim that online NPI licensing involves computations over clause-level meanings, not individual licensing lexical items



Outline

1. Phenomenon 1: the distance effect
 - a. Experiment 1 - prepositional phrases
 - b. Experiment 2 - verbs
2. Phenomenon 2: the licenser effect
 - a. Experiment 1 - *no* vs *haven't*
 - b. Experiment 2 - *no* vs *did not*
 - c. Experiment 3 - *very few* vs *haven't* in SRCs
 - d. Experiment 4 - *no* vs *haven't* vs *haven't...any*
3. **Complications**



Temporal adjuncts

(a) **No** authors [that the critics have recommended for the award / last week] have *ever* received acknowledgement for a best-selling novel.

(b) The authors [that **no** critics have recommended for the award / last week] have *ever* received acknowledgement for a best-selling novel.

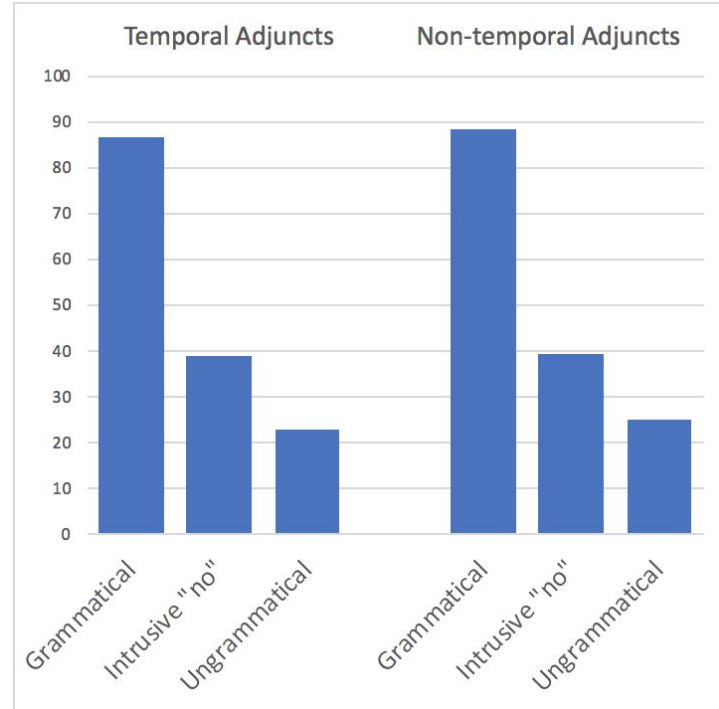
(d) The authors [that the critics have recommended for the award / last week] have *ever* received acknowledgement for a best-selling novel.

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(d) The authors [that the critics have recommended for the award / last week] have *ever* received acknowledgement for a best-selling novel.





Interpretation

- (a) **No** authors [that the critics have recommended for the award] have received acknowledgement for a best-selling novel.
- (b) The authors [that **no** critics have recommended for the award] have received acknowledgement for a best-selling novel.
- (c) The authors [that the critics **haven't** recommended for the award] have received acknowledgement for a best-selling novel.
- (d) The authors [that the critics have recommended for the award] have received acknowledgement for a best-selling novel.



Interpretation

(a) **No** authors [that the critics have recommended for the award] have received acknowledgement for a best-selling novel.

(b) The authors [that **no** critics have recommended for the award] have received acknowledgement for a best-selling novel.

(c) The authors [that the critics **haven't** recommended for the award] have received acknowledgement for a best-selling novel.

(d) The authors [that the critics have recommended for the award] have received acknowledgement for a best-selling novel.

Did the authors receive acknowledgement for a best-selling novel?



Interpretation

(a) **No** authors [that the critics have recommended for the award] have received acknowledgement for a best-selling novel.

(b) The authors [that **no** critics have recommended for the award] have received acknowledgement for a best-selling novel.

(c) The authors [that the critics **haven't** recommended for the award] have received acknowledgement for a best-selling novel.

(d) The authors [that the critics have recommended for the award] have received acknowledgement for a best-selling novel.

Did the authors receive acknowledgement for a best-selling novel? Yes / No



Interpretation

(a) **No** authors [that the critics have recommended for the award] have received acknowledgement for a best-selling novel.

(b) The authors [that **no** critics have recommended for the award] have received acknowledgement for a best-selling novel.

(c) The authors [that the critics **haven't** recommended for the award] have received acknowledgement for a best-selling novel.

(d) The authors [that the critics have recommended for the award] have received acknowledgement for a best-selling novel.

Did the authors receive acknowledgement for a best-selling novel? Yes / No, confidence: 1,2,3



Interpretation

(a) **No** authors [that the critics have recommended for the award] have received acknowledgement for a best-selling novel. **No!**

(b) The authors [that **no** critics have recommended for the award] have received acknowledgement for a best-selling novel.

(c) The authors [that the critics **haven't** recommended for the award] have received acknowledgement for a best-selling novel.

(d) The authors [that the critics have recommended for the award] have received acknowledgement for a best-selling novel.

Did the authors receive acknowledgement for a best-selling novel? Yes / No, confidence: 1,2,3



Interpretation

(a) **No** authors [that the critics have recommended for the award] have received acknowledgement for a best-selling novel. **No!**

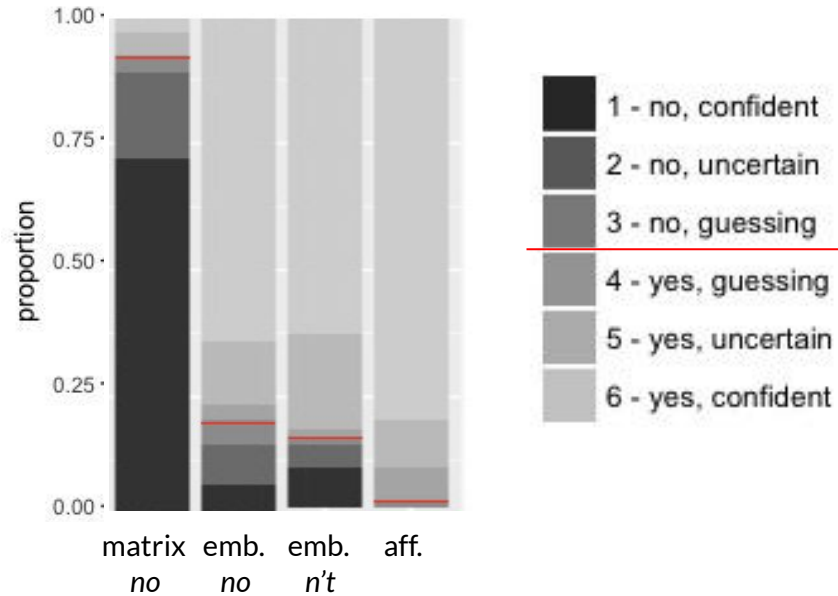
(b) The authors [that **no** critics have recommended for the award] have received acknowledgement for a best-selling novel.

(c) The authors [that the critics **haven't** recommended for the award] have received acknowledgement for a best-selling novel.

(d) The authors [that the critics have recommended for the award] have received acknowledgement for a best-selling novel. **Yes!**

Did the authors receive acknowledgement for a best-selling novel? Yes / No, confidence: 1,2,3

Interpretation





Interpretation

(a) **No** authors [that the critics have recommended for the award] have *ever* received acknowledgement for a best-selling novel.

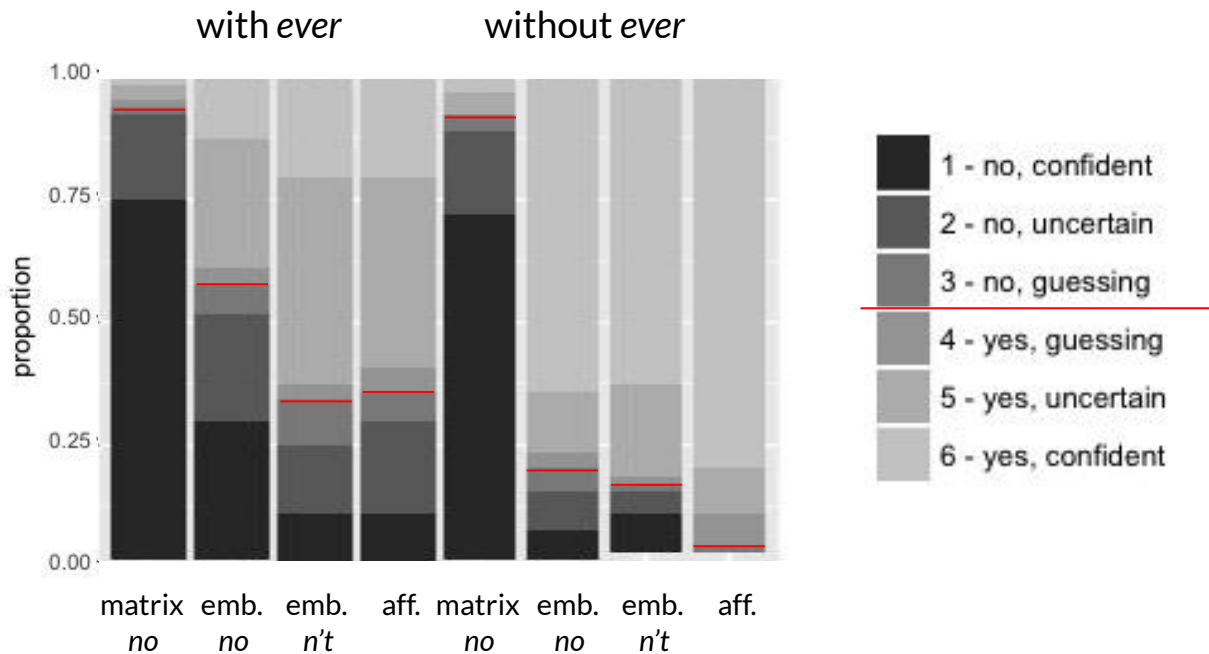
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(d) *The authors [that the critics have recommended for the award] have *ever* received acknowledgement for a best-selling novel.

Did the authors receive acknowledgement for a best-selling novel? Yes / No, confidence: 1,2,3

Interpretation





Thanks

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