# Negative polarity illusions: licensors that don't cause illusions, and blockers that do

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## Key findings

Intrusive negative quantifiers yield NPI illusions, but intrusive sentential negation does not:

➡ The authors [that no critics have recommended] have ever...
➡ The authors [that the critics haven't recommended] have ever...

RC adjuncts that combine poorly with *ever* leave illusions intact:

➡ The authors [that no critics recommended **last week**] have ever...

## Theoretical background

- Negative polarity items (NPIs, e.g *ever*) are only permitted with a negative element (licensor, e.g. *not* or *no*)
  - (1) No student has **ever** passed the exam.
  - (2) The students haven't **ever** passed the exam.
  - (3) *The students have **ever** passed the exam.

- Linear precedence insufficient; licensor must c-command NPI
  - (4) *The students [that didn't study] have **ever** passed the exam.

## Illusory NPI licensing

**NPI illusion:** structurally illicit licensors yield fleeting perception of acceptability
  (5) *The authors [that no critics recommended] have **ever** received acknowledgment for a best-selling novel.

- Robust across measures: eye-tracking [1], self-paced reading [2,3,4], speeded acceptability [4,5], ERPs [5,6,7]

- **Proximity** to the illicit licensor is crucial [4]

- Existing accounts of NPI illusions:
**Cue-based retrieval:** partial cue-matching in the search for a licensor
**Pragmatic licensing:** misapplication of pragmatic licensing mechanism
  -Neither can explain locality effect
  -Neither predicts a contrast between licensor types

## Experiments 1-3: licensor type

**Observation**: Negative quantifiers like *no X* are often used to make strong, general statements. These are ideal environments for semantic strengthening operations, which are the function of NPIs under some accounts [8].

**Question**: is quantificational negation a necessary ingredient for NPI illusions?
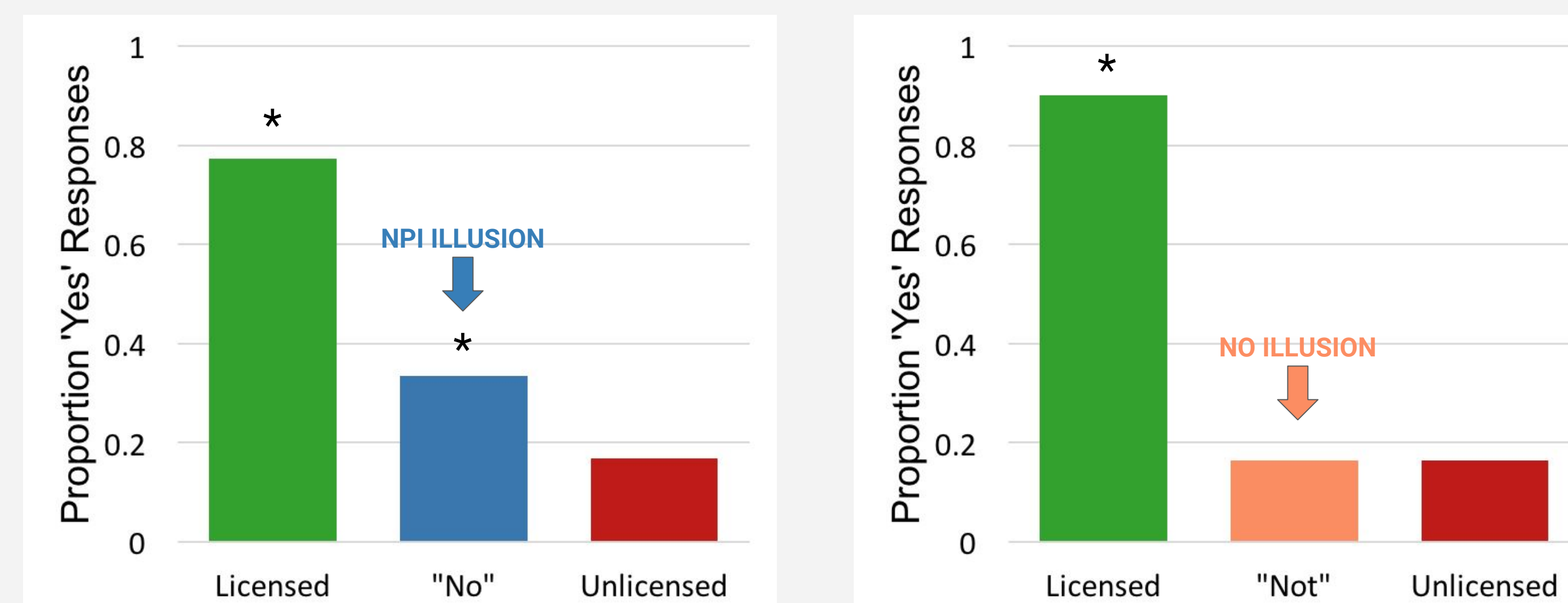
## Experiment 1: licensor type

**Design**: speeded acceptability; 36 sets of 4 items; 2 sub-experiments:
- experiment 1a (N=23): ABD (intrusive licensor = *no*);
- experiment 1b (N=20): ACD (intrusive licensor = *not*)

A. **No** authors [that the critics have recommended for the award] have **ever**...
B. The authors [that **no** critics have recommended for the award] have **ever**...
C. The authors [that the critics **haven't** recommended for the award] have **ever**...
D. The authors [that the critics have recommended for the award] have **ever**...

...received acknowledgment for a best-selling novel.

**Results**: replicated illusion effect with **negative quantifier (*no*)**; no evidence of an illusion with sentential negation (*not*)
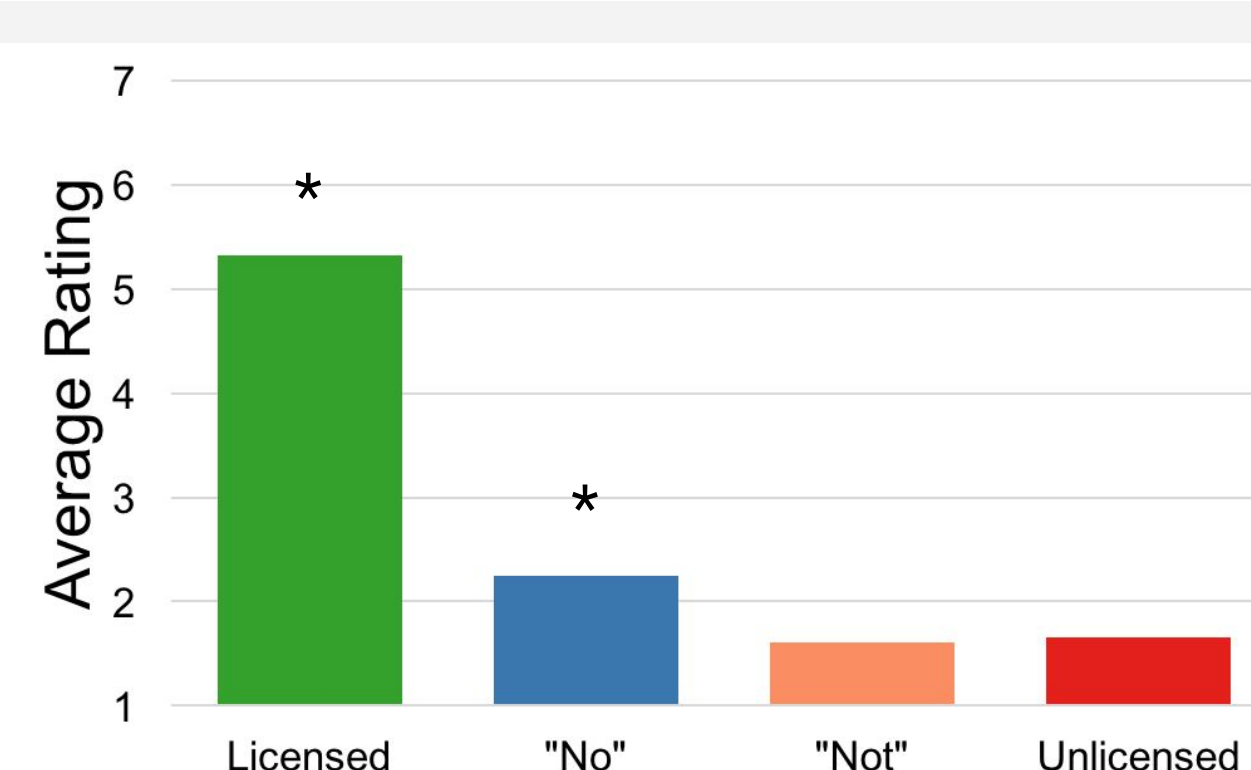


## Experiment 2: licensor type

**Design**: self-paced reading task (N=32) with conditions A-D

**Results**: 1-3 words after *ever*
- significant **slowdown** in sentential negation (*not*) and **unlicensed** conditions
- no slowdown in **negative quantifier (*no*)** or **licensed** conditions
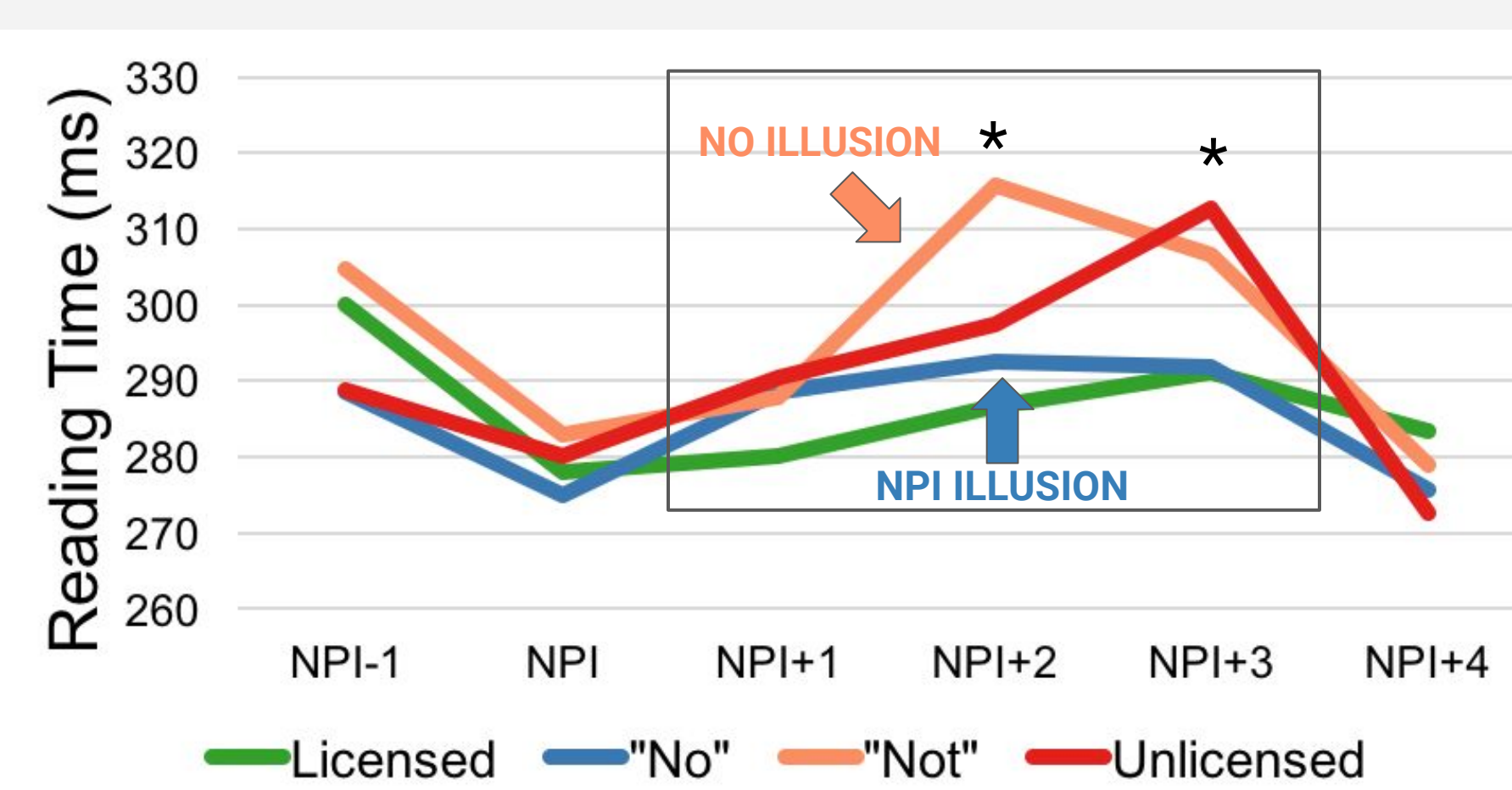


## Experiment 3: licensor type

**Design**: untimed 1-7 Likert scale judgements (N=15) for conditions A-D

**Results**:
- distinction between licensed and unlicensed NPIs: low ratings for the ungrammatical conditions (B, C, D)
- **quantificational negation (*no*)** condition was rated slightly better than *not* or unlicenced



## Corpus analysis

**Question**: what is the frequency of co-occurrence of quantificational negation and sentential negation with *ever*?

**Results**: Environments with *no* were 6x more likely to also contain *ever* than environments with *n't/not* ($p<0.05$) in the COCA corpus [9]

| Query | Frequency of *ever* per 5000 sentences |
|---|---|
| [No] | 59 (1.18%) |
| [Not] / [n't] | 12 (0.24%) |

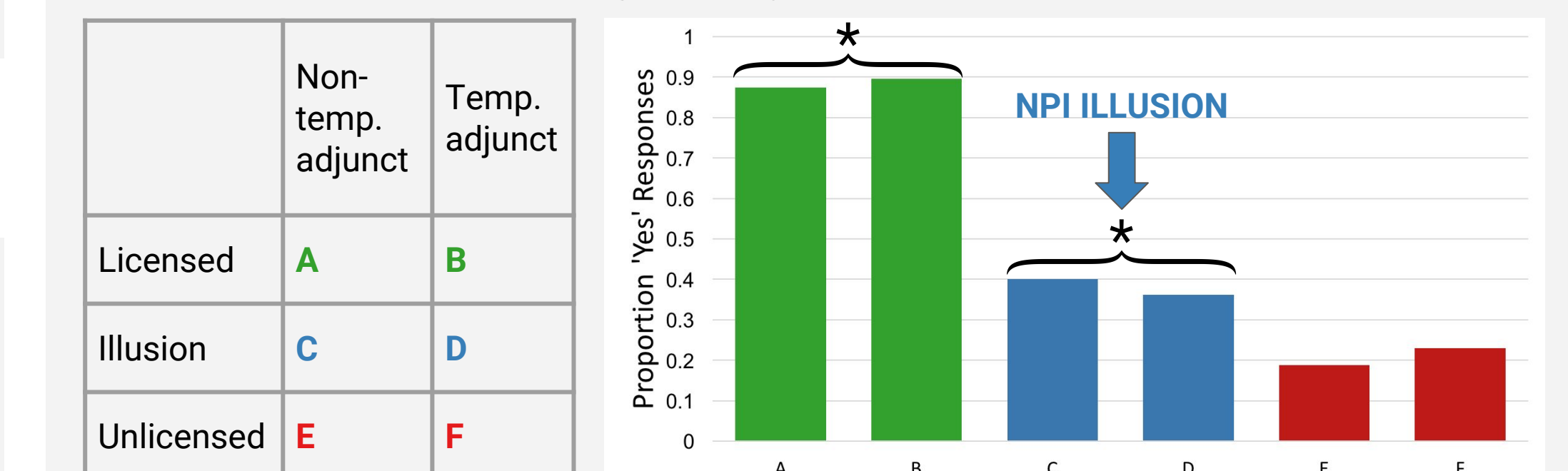## Experiment 4: temporal adjuncts

**Observation**: Specific temporal adjuncts like *last week* combine poorly with *ever* and may reduce expectations for *ever*.

**Question**: are illusions blocked in sentences where *ever* should not be expected inside the RC due to a temporal adjunct?

**Design**: speeded acceptability (N=10), 12 sets of 6 items

No/The authors [that the/no critics recommended...
A/C/E: ... **for the award**] have **ever** received acknowledgment...
B/D/F: ... **last week**] have **ever** received acknowledgment...

**Results**: No effect of adjunct type observed

| | Non-temp. adjunct | Temp. adjunct |
|---|---|---|
| Licensed | A | B |
| Illusion | C | D |
| Unlicensed | E | F |



## Discussion & Conclusions

- NPI illusions don't depend on retrieval of a suitable licensor.

- NPI illusions are **sensitive to the semantic properties** (e.g. compatibility with strengthening operations) of the intrusive licensing environment beyond the mere presence of negation.

- The presence of specific mismatching properties (i.e. the incompatibility of *ever* with temporal adjuncts) isn't enough to block illusory licensing.

**REFERENCES**: [1] Vasishth, Brüssow, Lewis, & Drenhaus. 2008. *Cognitive Science*. [2] Xiang, Dillon, & Phillips. 2006. 19th *CUNY conference*. [3] Xiang, Grove, & Giannakidou. 2013. *Fr. in Psychology*. [4] Parker & Phillips. 2016. *Cognition*. [5] Drenhaus, Saddy, & Frisch, 2005. *Linguistic evidence*. [6] Xiang, Dillon, & Phillips. 2009. *Brain & Language*. [7] Yanilmaz & Drury. 2014. 27th *CUNY conference*. [8] Kadmon & Landman. 1993. *Linguistics and philosophy*. [9] Davies. 2008-. The Corpus of Contemporary American English. http://corpus.byu.edu/coca/