



Cars and trucks [with permits]: Resolving legal ambiguities with psycholinguistic data



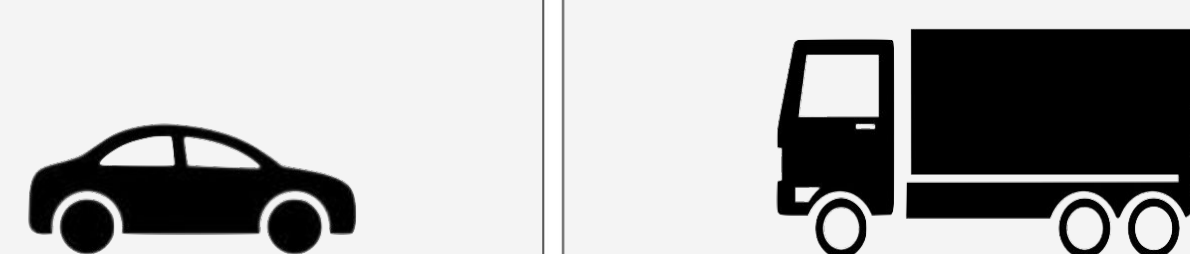
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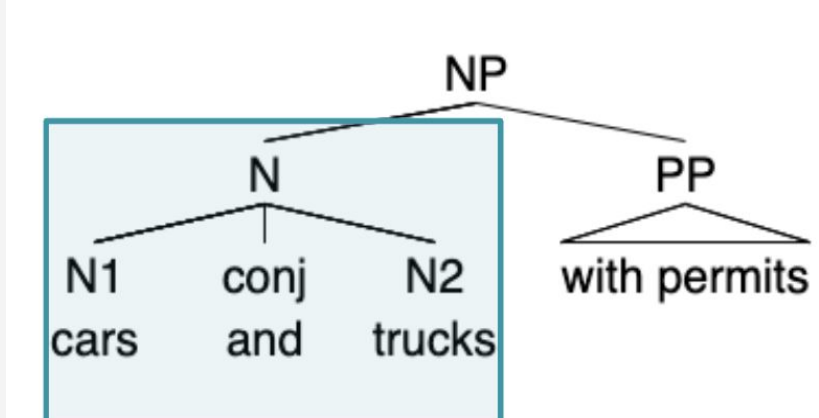
Background

I drive my car into a parking lot and see this confusing sign:

Cars and trucks with permits are allowed.



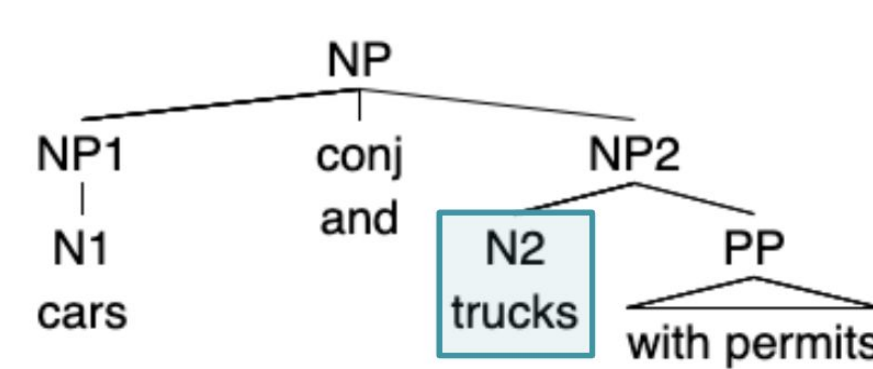
Is THIS the meaning?



I hope not. I have no permit.

But wait.

Maybe THIS is the meaning. And then I CAN park here.



Ambiguous laws are common, and judges often disagree as each tries to find the "ordinary meaning". But how do they know what this is?

Research suggests that our default interpretation is wide-scope:

athletes and photographers [with their gear]

But semantic bias might lead us to a narrow-scope preference:

athletes and photographers [with their cameras]

unless syntax prevents it:

photographers and athletes [with their cameras]

In two experiments, we tested native speakers' intuitions about these kinds of scope ambiguities.

Hypotheses

Hypothesis I: The preferred PP reading is wide-scope not narrow-scope (Clifton et al., 2002, Jeon & Yoon, 2012).

Hypothesis II: Semantic bias can weaken the default wide-scope preference.

Hypothesis III: Syntactic constraints override semantic biases.

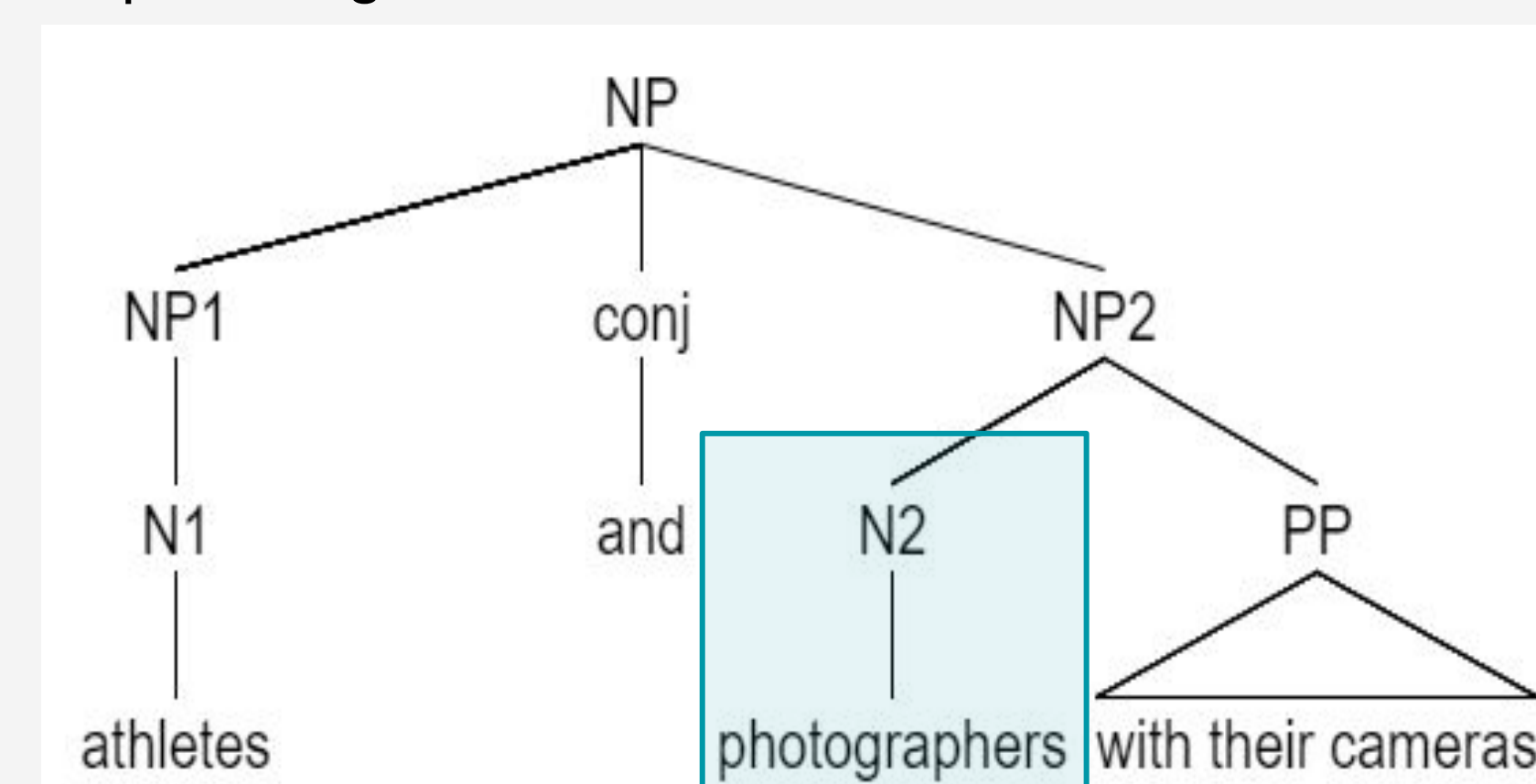
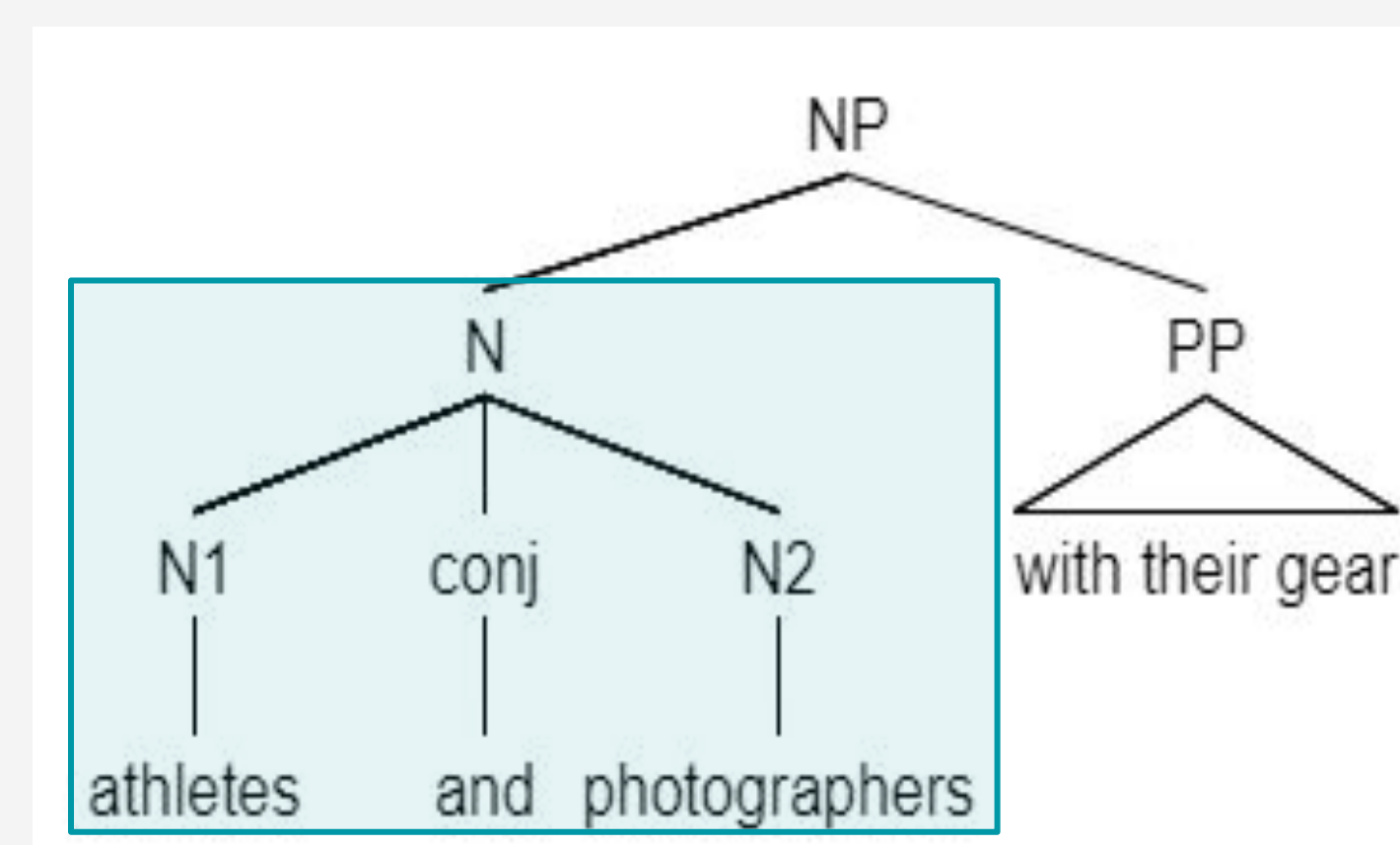
Experiment 1

Experiment 1 tested Hypotheses I & II by comparing the interpretations of sentences with **unbiased** PPs and **semantically-biased** PPs.

We predict that:

Sentences with **unbiased PPs** [with their gear] will show a strong wide-scope preference.

Sentences with **semantically-biased PPs** [with their cameras] will show a weaker wide-scope preference, and more narrow-scope readings.



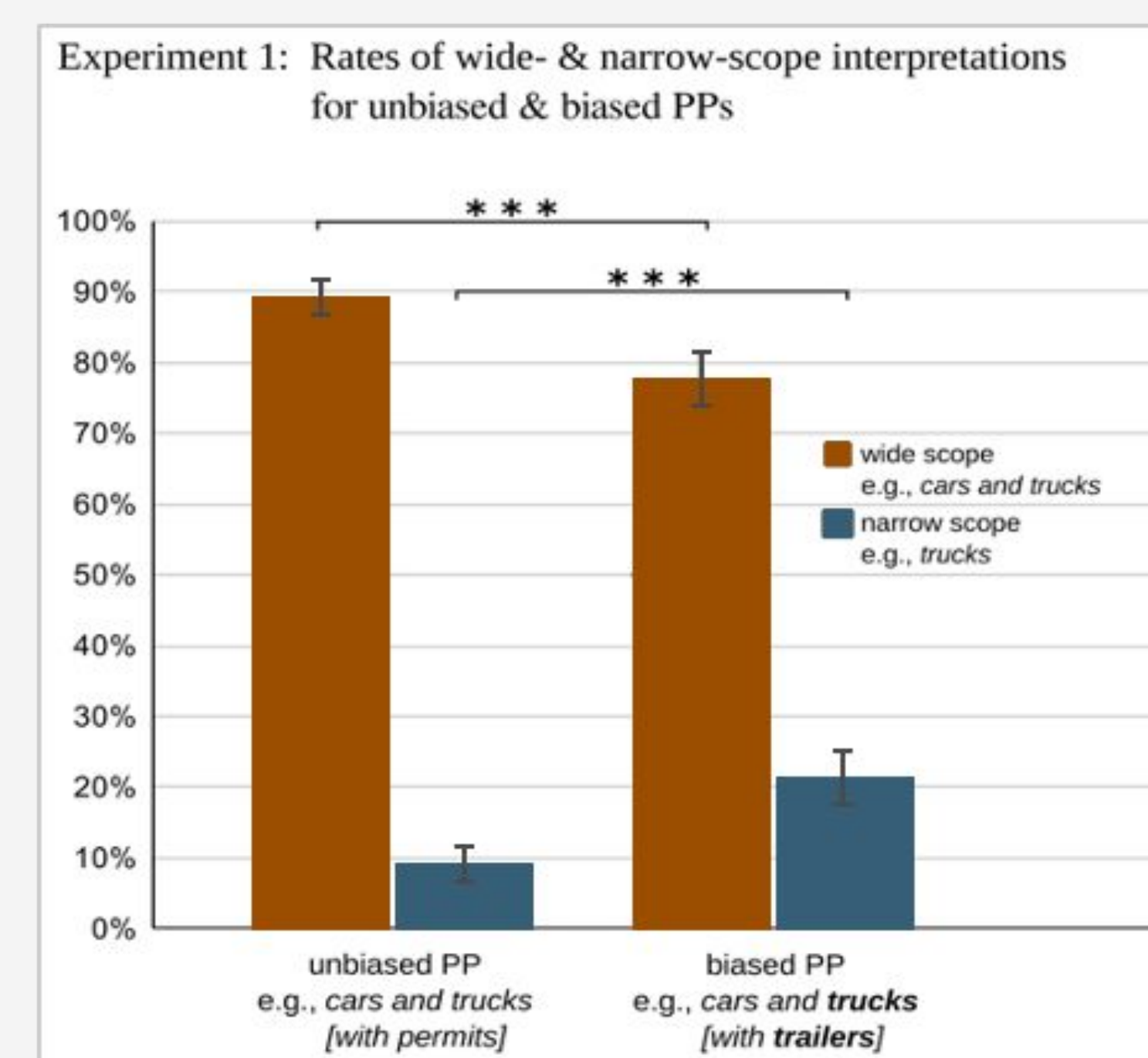
Results

- Wide-scope interpretation in **unbiased** sentences: **89.4%**
- Wide-scope interpretations in **biased** sentences: **77.8%**.

Hypothesis I was confirmed. Subjects significantly preferred wide-scope interpretations in both unbiased and biased sentences.

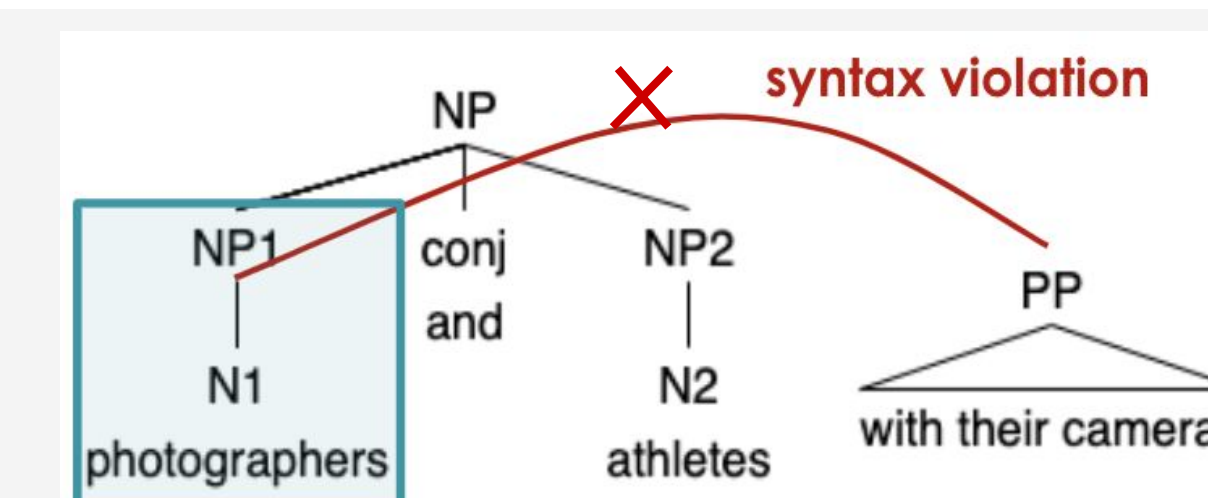
Hypothesis II was also confirmed. The rate of wide-scope interpretations was significantly smaller in biased sentences than in unbiased sentences.

Results



Experiment 2

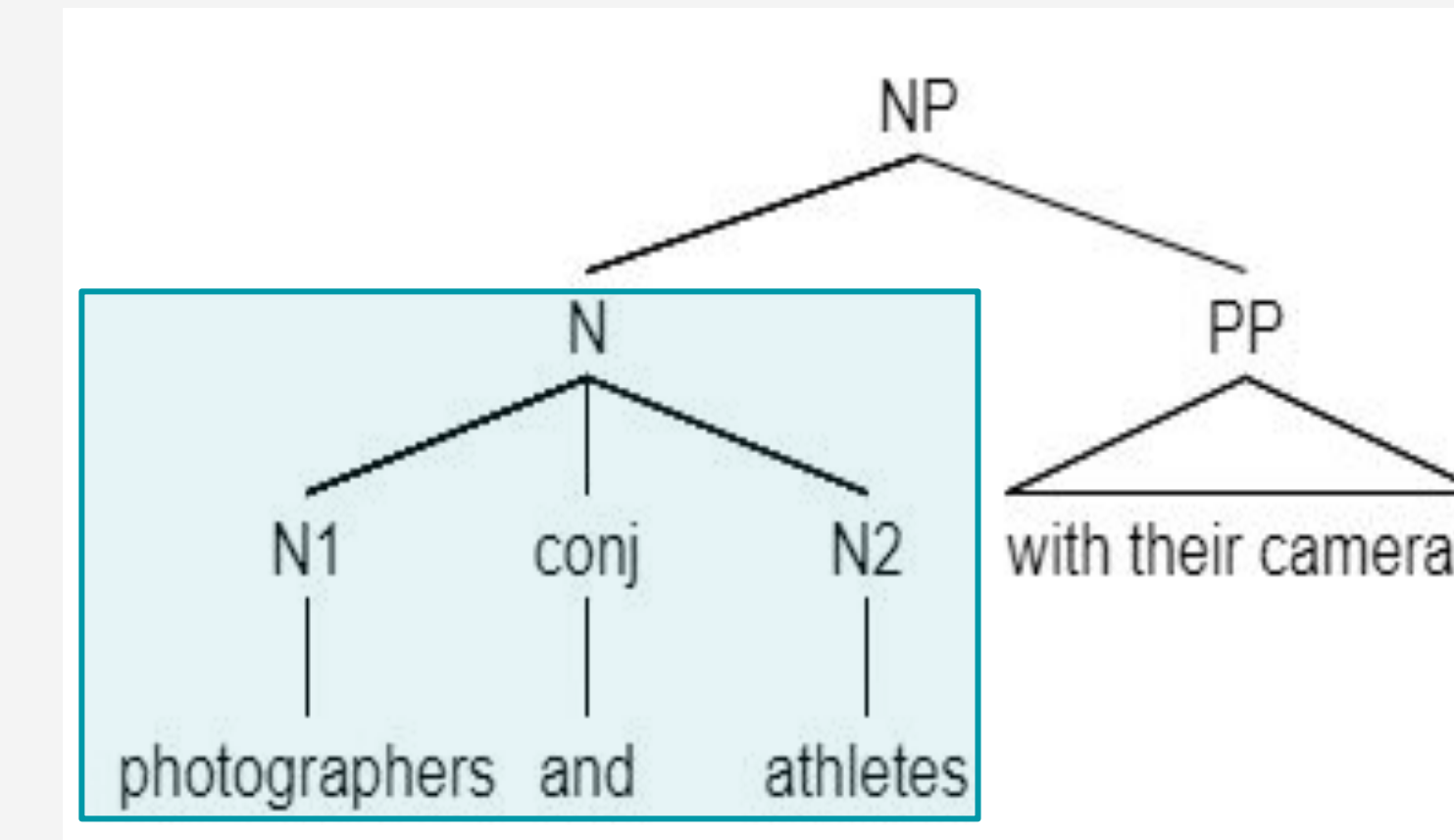
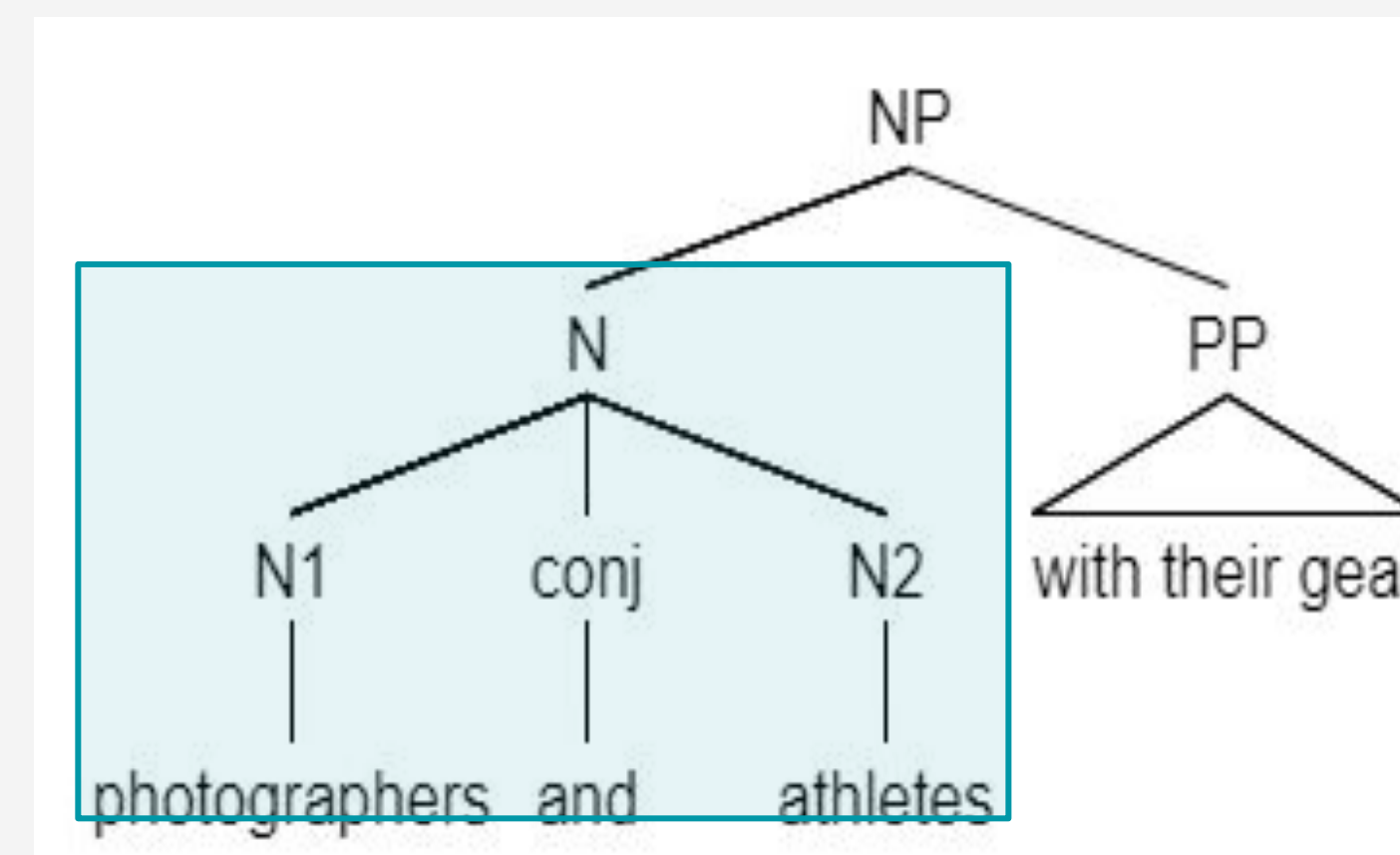
Experiment 2 tested Hypotheses I & III by reversing the nouns from Experiment 1. Now, in the biased case, the PP cannot attach to the related noun without violating syntax:



We predict that:

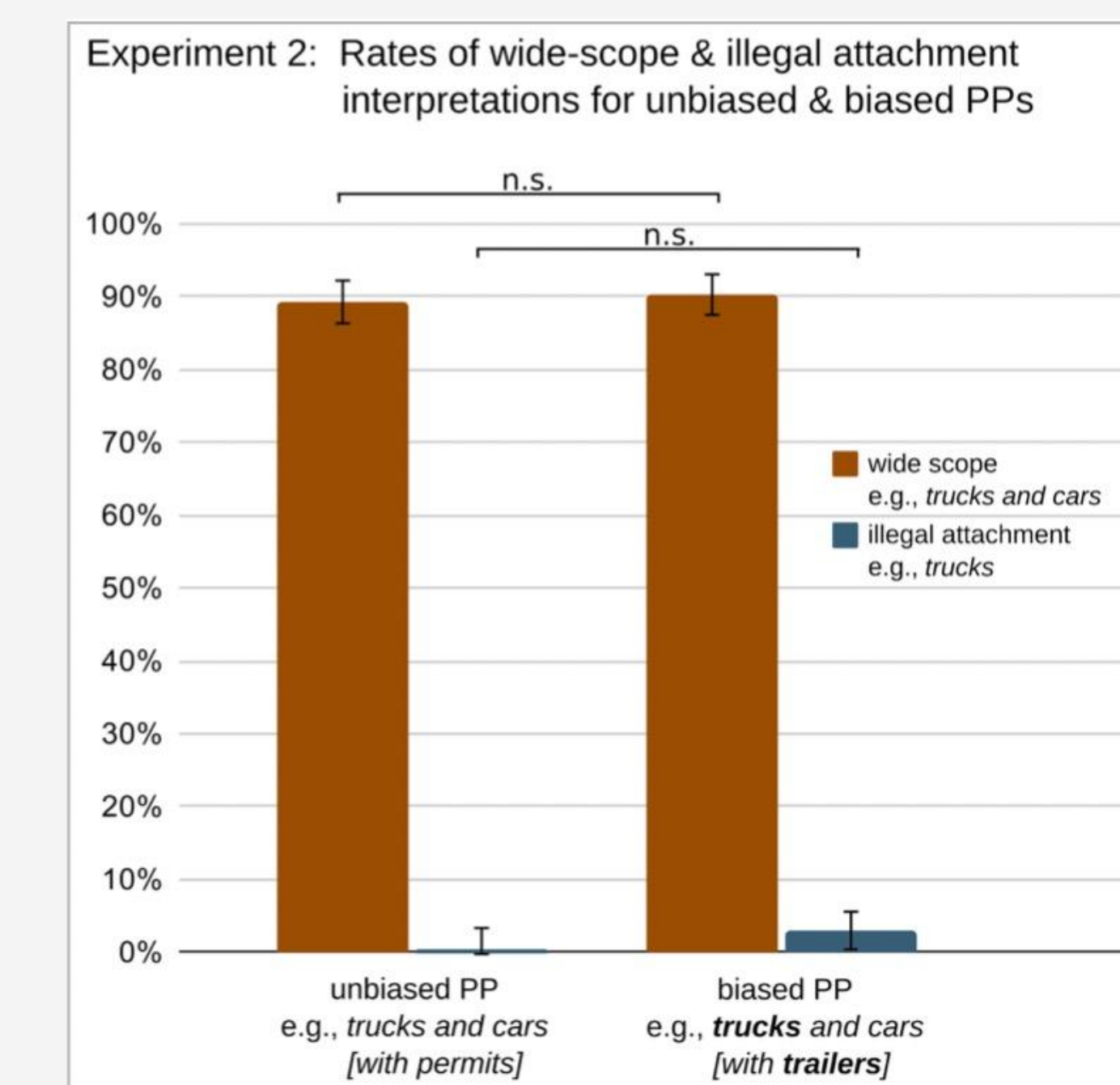
Sentences with **unbiased PPs** [with their gear] will still show a strong wide-scope preference.

Sentences with **"illegally" biased PPs** [with their cameras] will obey syntax over semantics and show a similar wide-scope preference



- Wide-scope interpretations in **unbiased** sentences: **89.3%**
- Wide-scope interpretations in **biased** sentences: **90.3%**

Subjects significantly preferred wide-scope interpretations in both unbiased and biased sentences, supporting Hypothesis I. Unlike in Experiment 1, the proportion of participants who chose wide-scope interpretations was not significantly different in biased sentences compared to unbiased sentences, supporting Hypothesis 3.



Methodology: Experiments I & II

Subjects

- Experiment 1: 63 subjects
- Experiment 2: 53 subjects
- Recruited via Lucid (an online survey-distribution service) with demographics roughly matching those of the US Jury eligible population (US citizens over 18)

Materials & Procedure

Each subject saw 12 test sentences containing an ambiguous PP, 6 biased + 6 unbiased, each sentence in only one version. After each sentence was a question about the interpretation of the PP.

[Athletes]_{N1} & [photographers]_{N2} [with their gear]_{PP} [waited by the van]_{VP}.

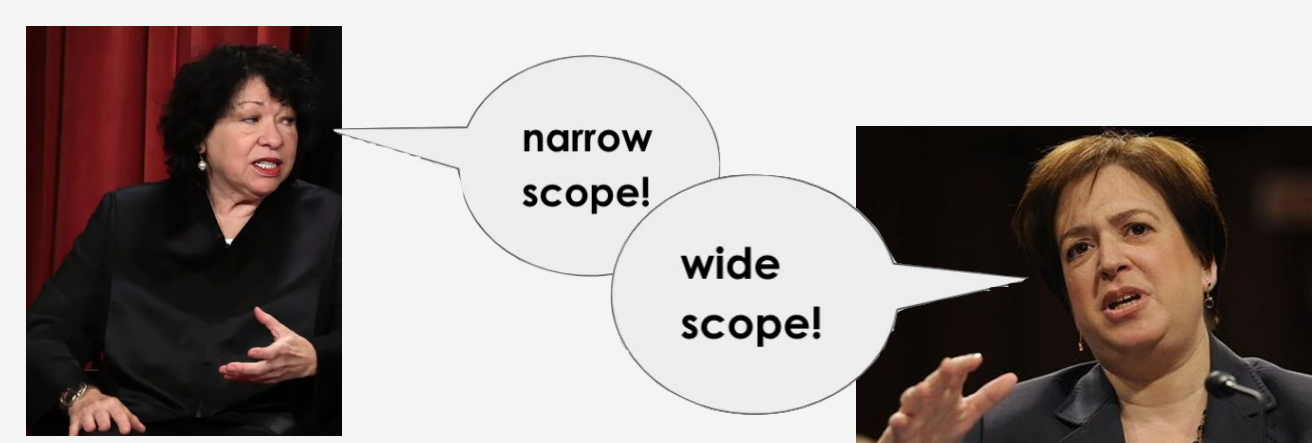
Who had their gear?

- The athletes
- The photographers
- The athletes and the photographers
- None of the above

Interspersed with the test sentences were 12 randomized attention-testing items. Subjects who failed the attention test or failed to answer any questions were excluded from the analysis.

Conclusions

Our results suggest that for PP modifiers on lists of nouns,



- a wide-scope reading is preferred And as for laws, they need to be written clearly, and interpreted with an understanding of the
- semantics can override this preference semantic and syntactic factors that create "ordinary meaning"..
- BUT
- semantics can't override syntax **So judges, ask a psycholinguist.**

Acknowledgements

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