

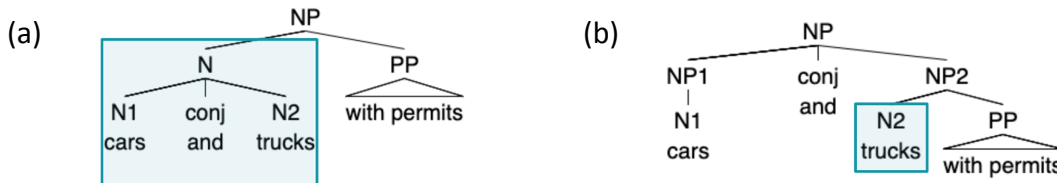
## Cars and trucks [with permits]: Ambiguous legal language meets psycholinguistics

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A sign in a parking lot says:

(1) Cars and trucks **with permits** are allowed

Are cars without permits allowed? When this kind of scope ambiguity arises in the law, judges must decide whether the PP [with permits] has (a) wide scope, applying to both conjuncts [cars] and [trucks] or (b) narrow scope, applying only to the last conjunct [trucks].



To make these decisions, judges refer to a set of legal guidelines, called “Canons of Interpretation.” One canon, the “Series Qualifier Canon,” says that the PP [with permits] applies widely, as in (a). Both cars and trucks must have permits. In contrast, the “Last Antecedent Rule” says that [with permits] applies narrowly, as in (b). Cars without permits would be allowed. To decide which canon to use, judges search for the “ordinary” meaning, imagining how most people interpret a phrase (Solan 2018; Tobia, et al. 2022). But are judges’ intuitions right? As Tobia and Solan have both pointed out, while judges are experts in the law, their intuitions are not experimental data. This is where psycholinguists can help.

Our research, in the new field of experimental jurisprudence (Tobia, in press), provides the evidence that judges need. In two experiments, using a Qualtrics survey distributed through the Lucid platform, we tested how native speakers interpret ambiguous phrases like (1). We hypothesized:

**Hypothesis I:** In sentences like (1), the default interpretation is wide-scope, as a number of studies have suggested (Clifton et.al. 2002, Jeon & Yoon 2012, Sedivy & Spivey-Knowlton 2015, Spivey-Knowlton & Sedivy 1995). All vehicles need permits.

(1) Cars and trucks **with permits** are allowed

**Hypothesis II:** Semantic bias can weaken this wide-scope preference. A narrow-scope reading will be preferred for sentences like (2), because the PP [with trailers] is biased towards the last conjunct, [trucks].

(2) cars and trucks **with trailers**

**Hypothesis III:** Semantic bias cannot override syntactic constraints. Although the PP in (3) is still biased towards [trucks], it must apply widely. When [trucks] is the first conjunct, it is syntactically inaccessible to the PP.

(3) trucks and cars **with trailers**

Experiment 1 (n=63) tested Hypotheses I & II, contrasting how subjects interpret sentences like (1) and (2). As Figure 1 shows, Hypothesis I was confirmed for both types of sentences. Subjects strongly preferred a wide-scope reading for both (89% and 78%,  $p < 0.001$ ). Hypothesis II was also confirmed: the biased sentences showed significantly fewer wide-scope interpretations than the unbiased sentences (89% unbiased vs. 78% biased,  $p < 0.001$ ).



To test Hypothesis III, that semantic bias will **not** violate syntactic constraints, Experiment 2 (n=53) used the same sentences as Experiment 1, but with their conjuncts reversed: [trucks and cars **with permits**] and [trucks and cars **with trailers**]. Here, the semantically-preferred noun, trucks, is the first conjunct and inaccessible to the PP without attaching it

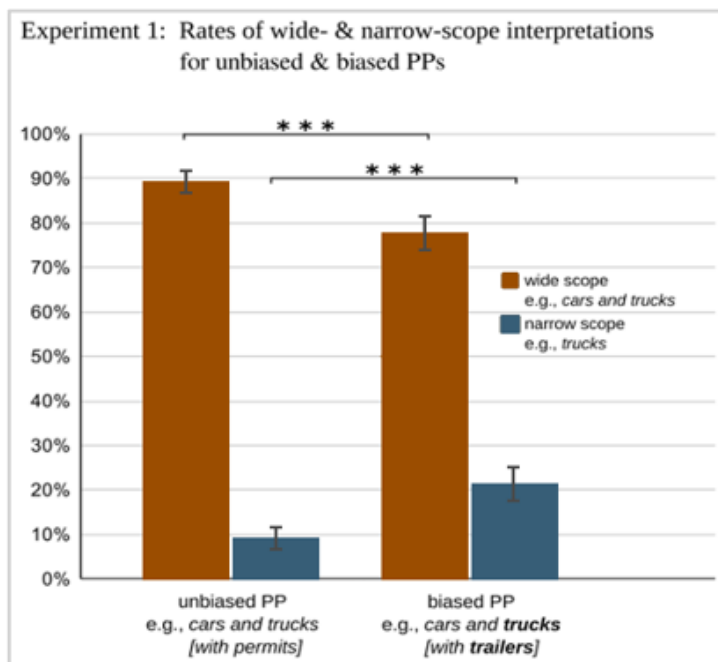
“illegally,” as shown in (c). As Figure 2 shows, semantic bias had no effect, as predicted. Subjects again showed a wide-scope preference for unbiased PPs, and now also showed a wide-scope preference for *biased* PPs (89% unbiased and 90% “illegally” biased to the first conjunct,  $p > 0.5$ ). Semantic bias could not override syntactic constraints.

In interpreting the law, judges aim to resolve ambiguous language in the most natural way. Psycholinguistic studies offer a resource to the legal community, providing a way for judges to test their intuitions against empirical data. By researching issues at the interface of language and law, psycholinguists can help answer important legal questions and improve how justice is done.

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**Figure 1**



**Figure 2**

