

Syntactic priming disambiguates globally ambiguous sentences in language comprehension

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Scheepers 2003	RC attachment	<i><u>The author of the fliers that...</u> ~ The author of <u>the fliers that...</u></i>

Syntactic priming in sentence comprehension

Variable results--often dependent on lexical overlap.

Branigan, Pickering & McLean 2005	PP attachment	<i>prod the doctor <u>with the gun</u> ~ prod <u>the doctor</u> <u>with the gun</u></i>
Arai, VanGompel & Scheepers 2007	Dative alternation	<i>give [the boy][the book] ~ give [the book][to the boy]</i>
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Scheepers & Crocker 2004	Subject-object order (German)	<i>The nurse-Ag the priest-Pt pushes ~ The nurse-Pt the priest-Ag pushes</i>

Comprehension v. Production

“priming in comprehension versus production are at least quantitatively different--priming is weaker in comprehension than it is in production.

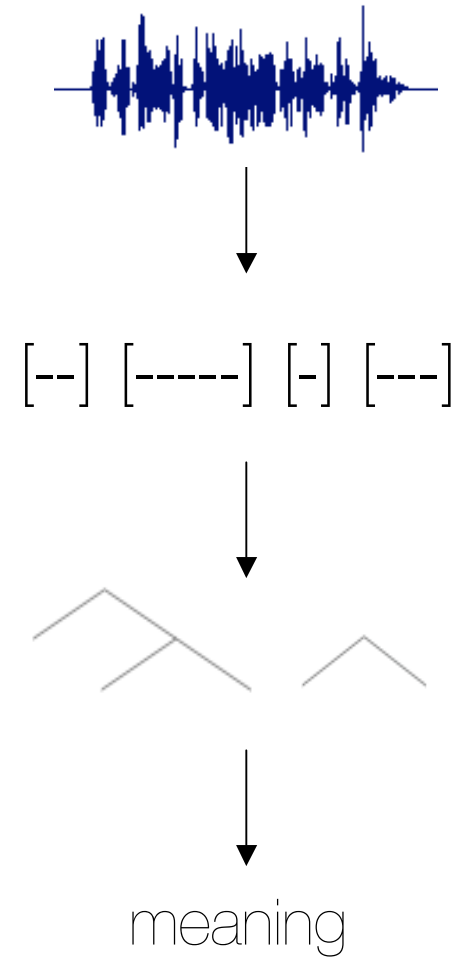
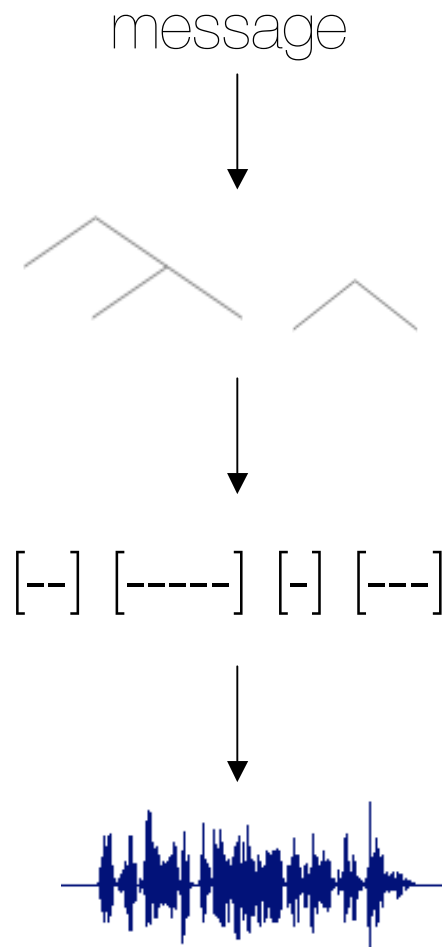
...in nearly every case, to observe priming within comprehension, some ‘boost’ is needed.”

~Pickering & Ferreira 2008

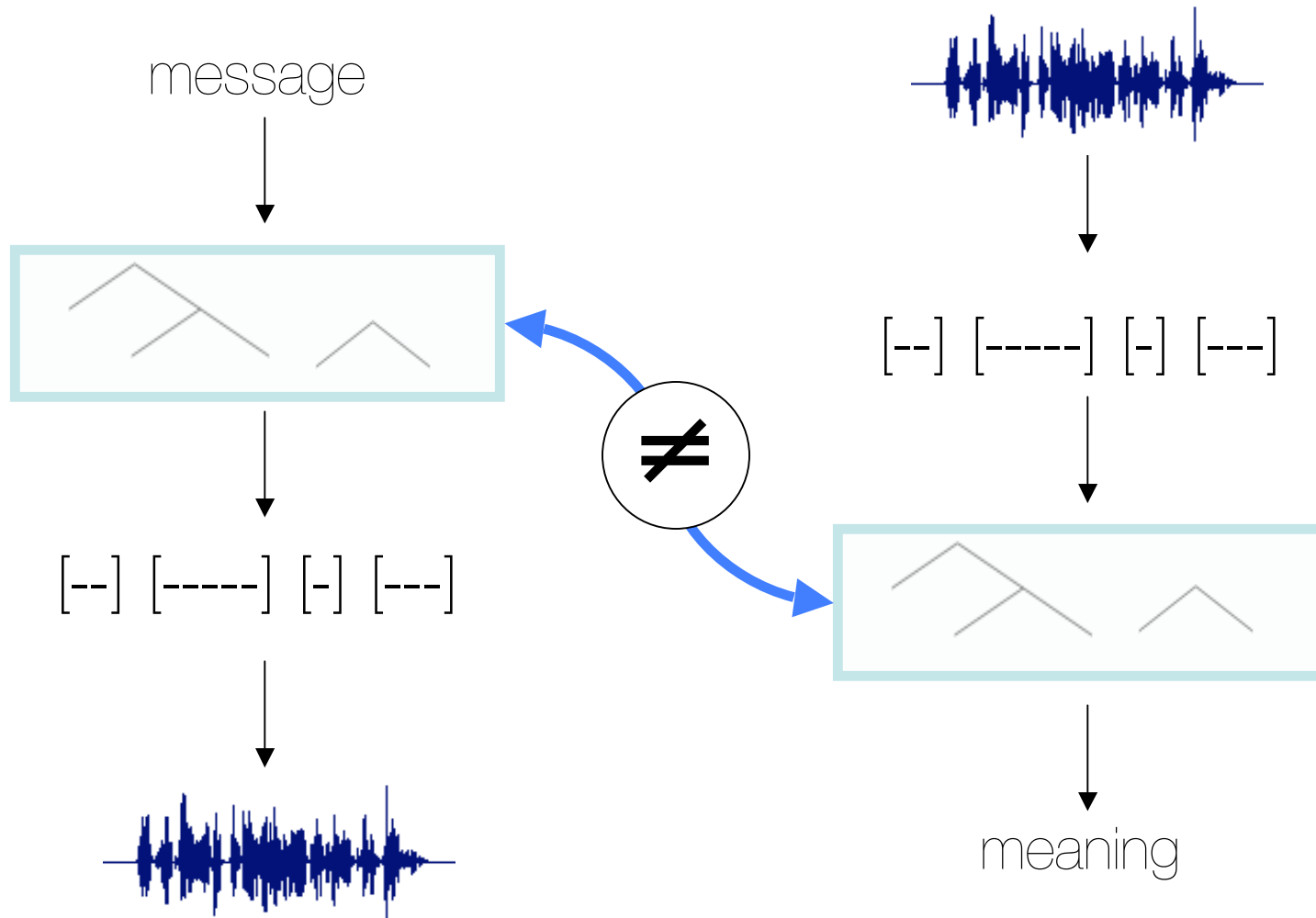
Why do comprehension and production differ?

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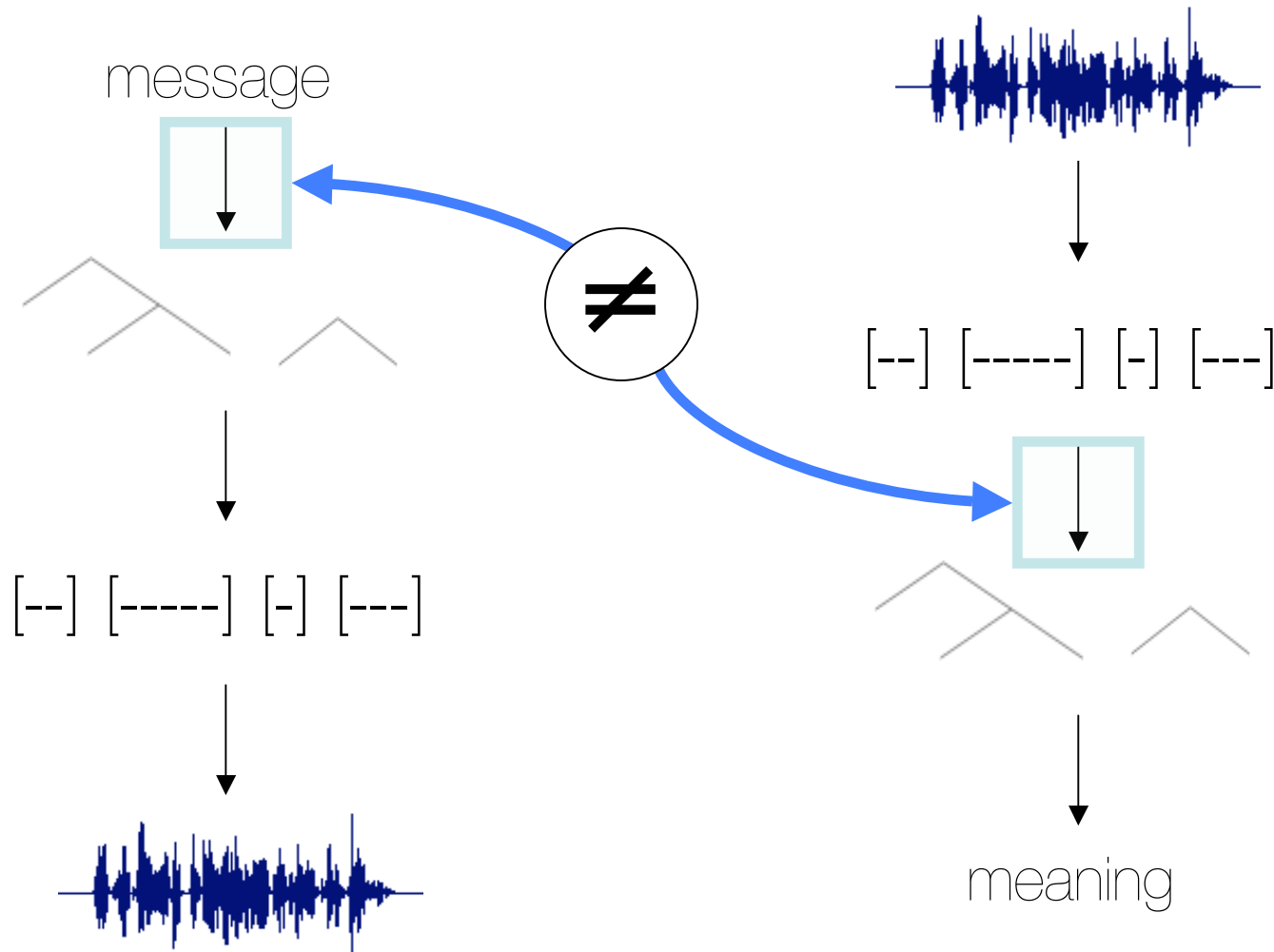
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- Different *representations* involved in sentence production v. comprehension.
- Different *mechanisms* involved in constructing syntactic forms in production v. comprehension.

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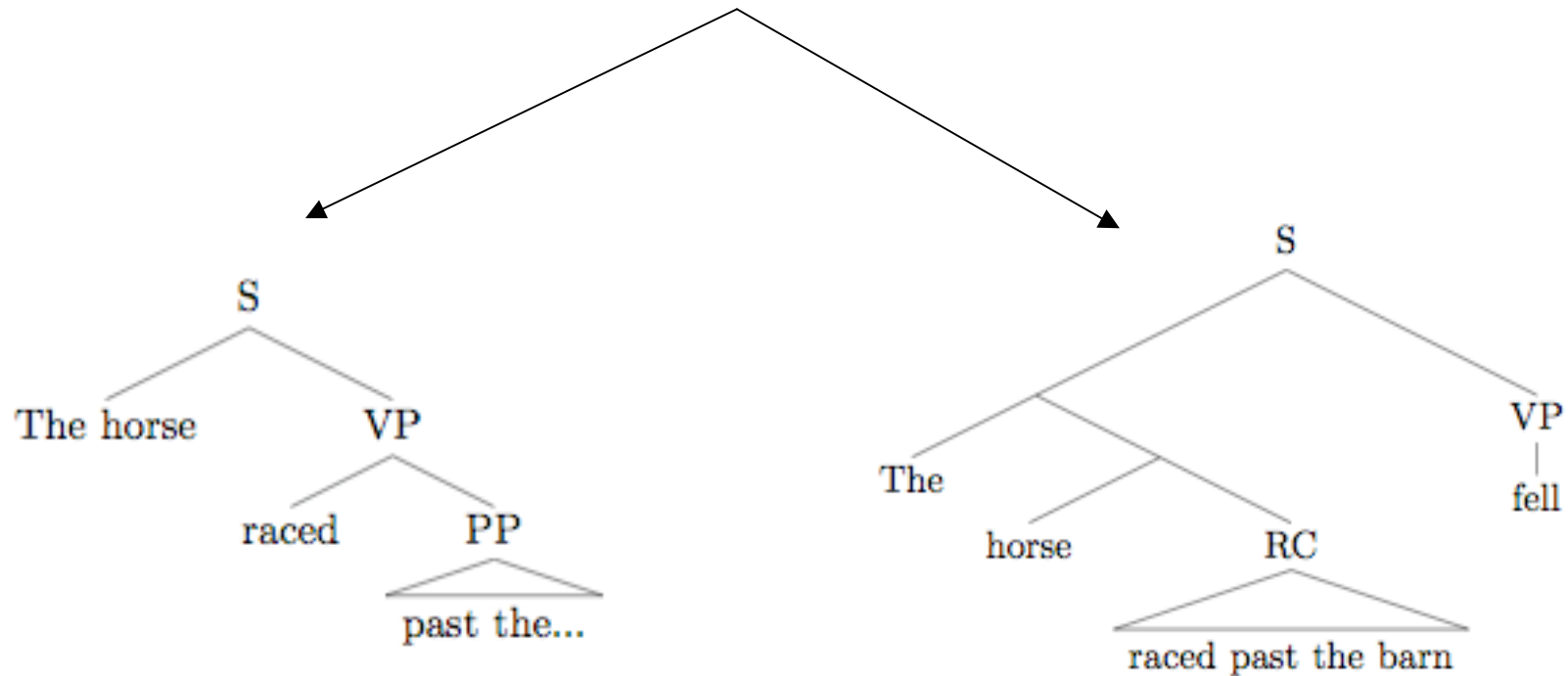
When we look for syntactic priming in sentence comprehension in a way more parallel to how priming is measured in production, we find it.

Previous studies: Priming in locally ambiguous sentences

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*The horse **raced** past the barn fell.*

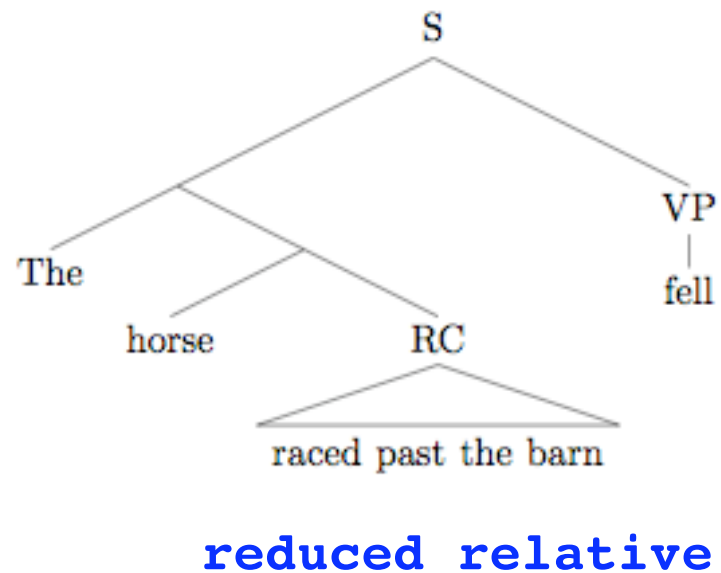
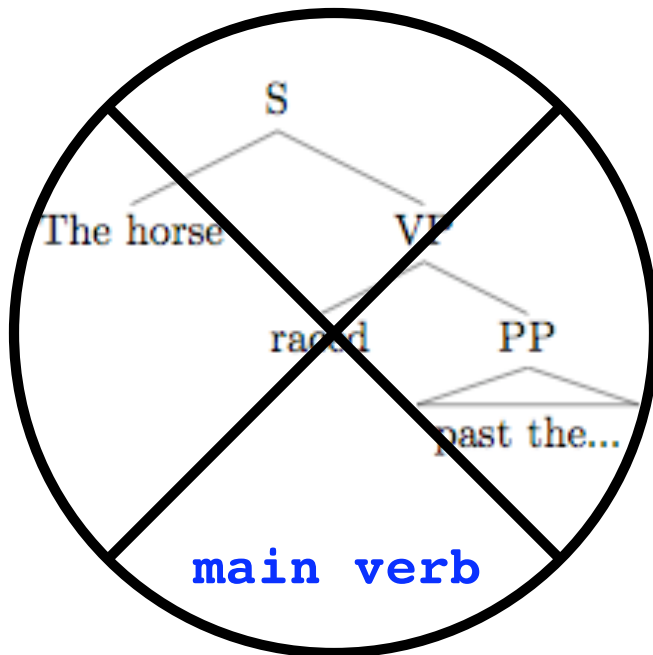


main verb

reduced relative

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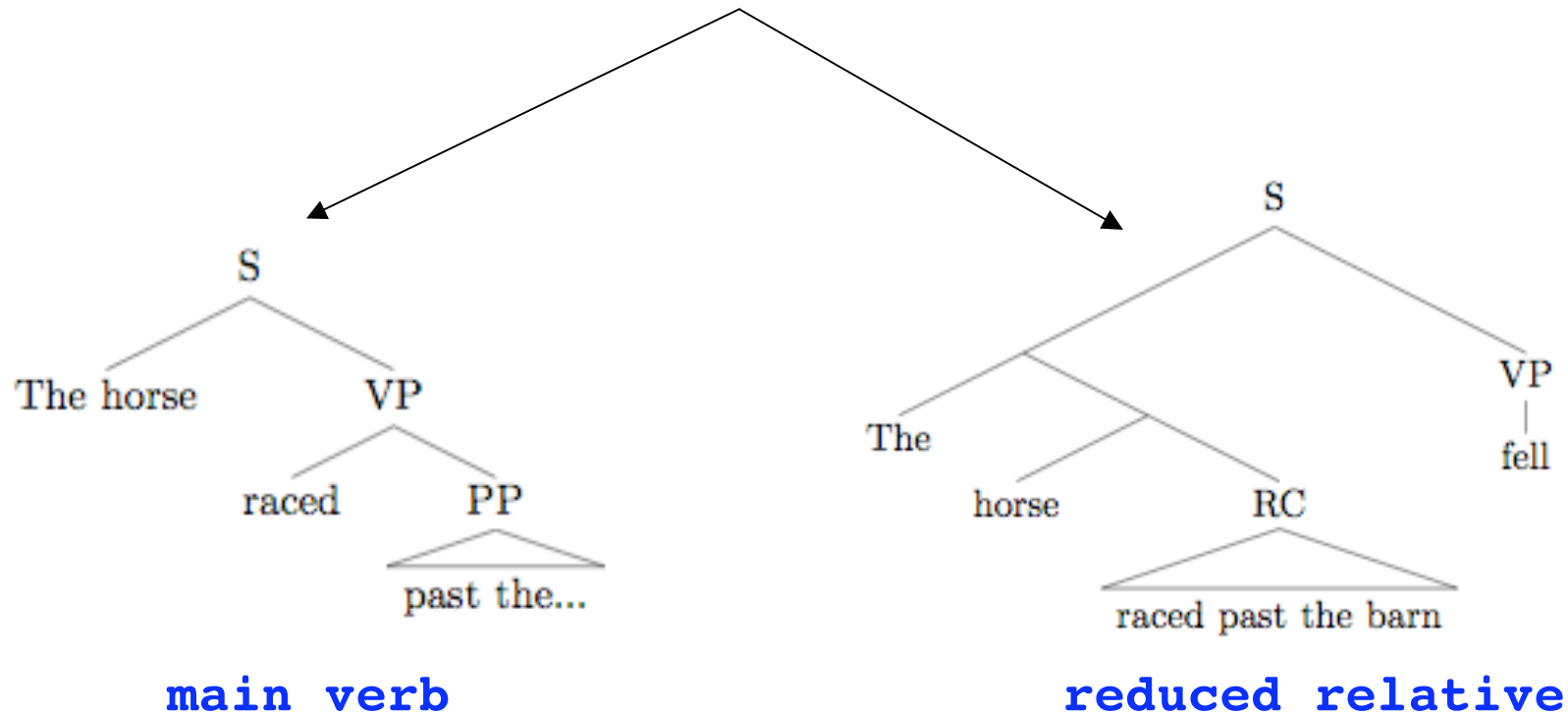


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The intern given the important job flaked.

prime

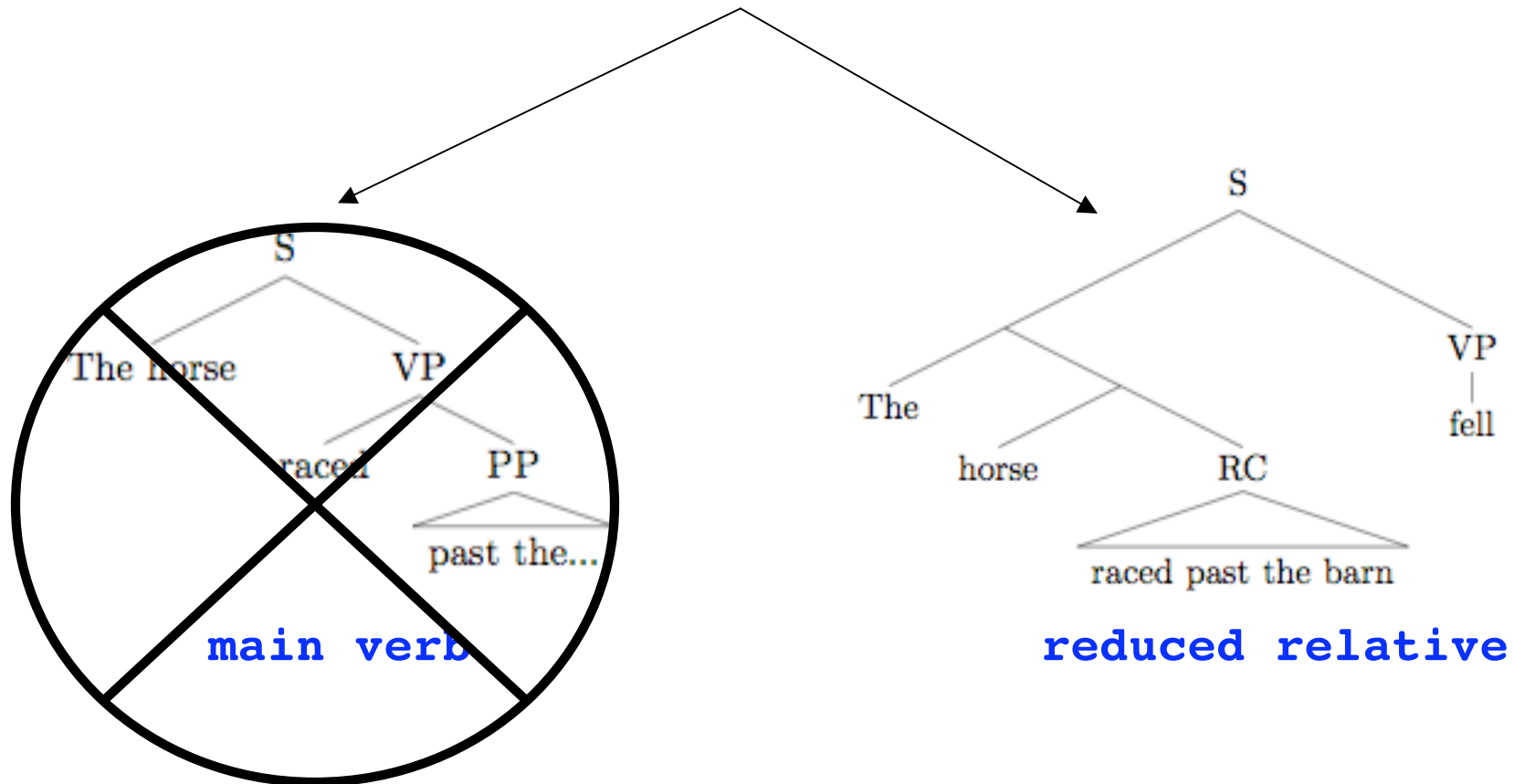
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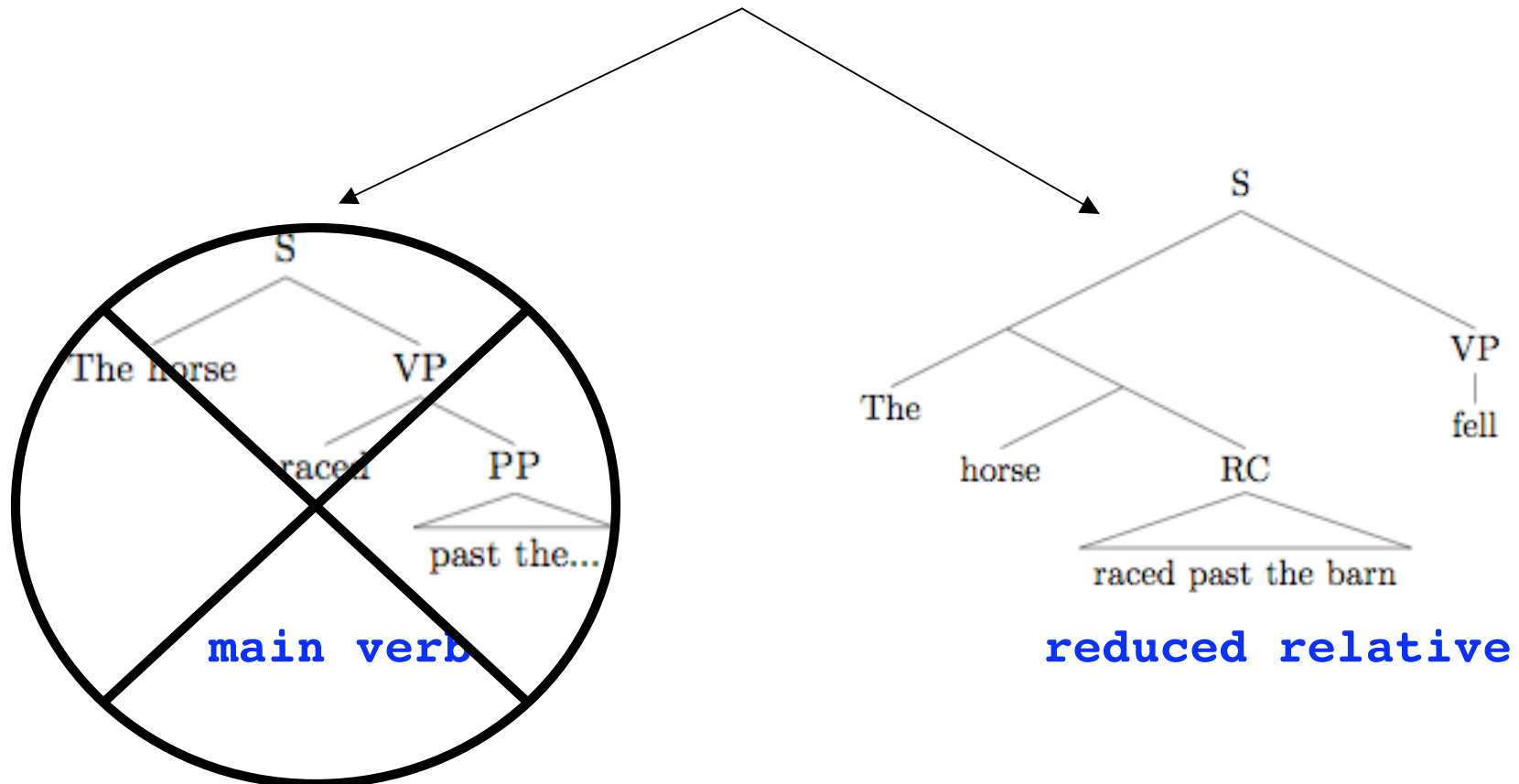
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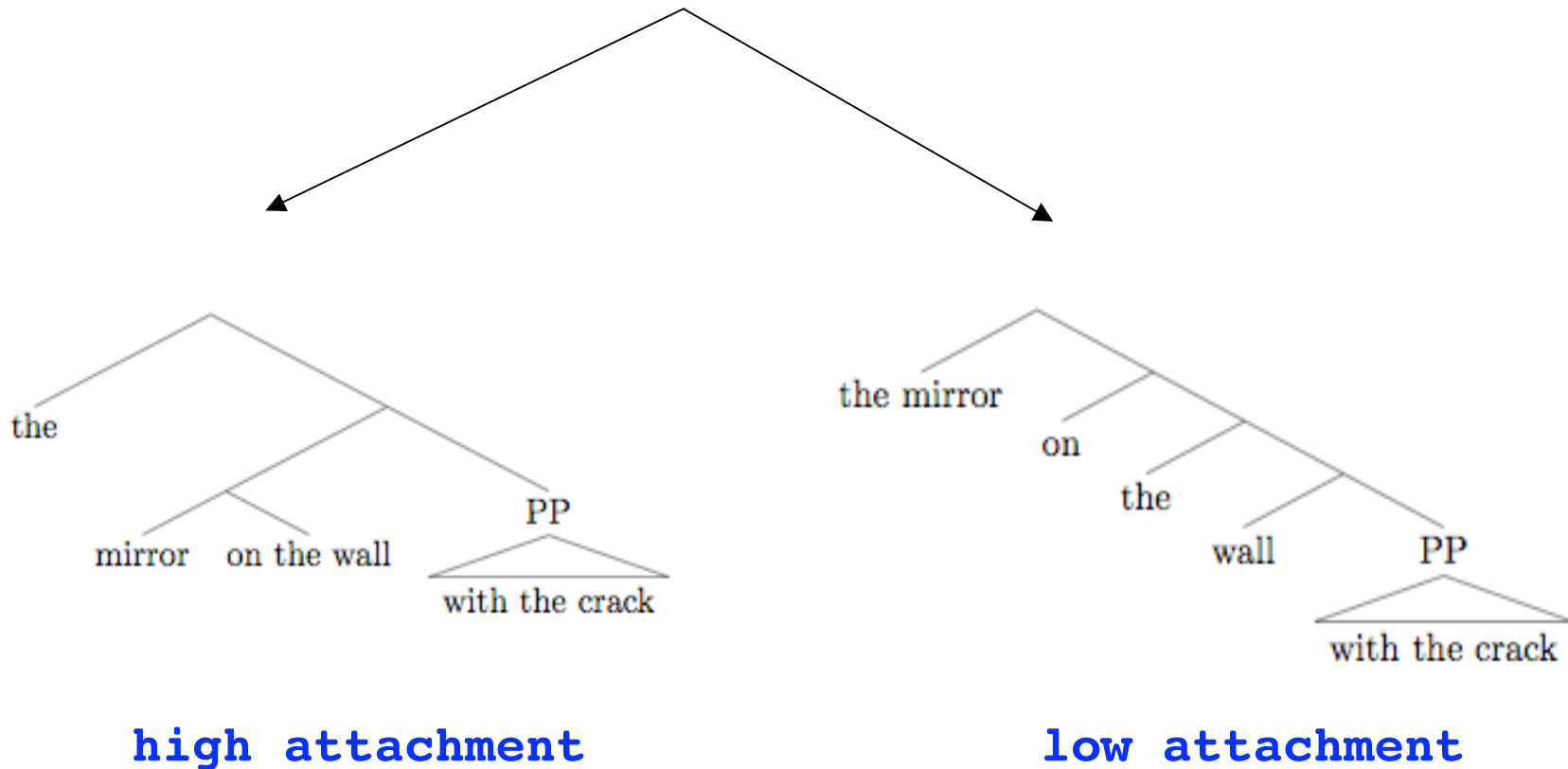
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Why doesn't this work? Potential problems

- With local ambiguity, readers do not choose the interpretation that the sentence gets--material later in the sentence disambiguates it → one correct parse.
- Unlike typical syntactic priming experiment in sentence production: In a situation where either structural alternative yields an appropriate meaning ('all else equal'), are speakers more likely to choose a previously used structure?
- Instead, typical comprehension studies look for a decrease in reading time--a more indirect measure, and generally weaker than form choice.

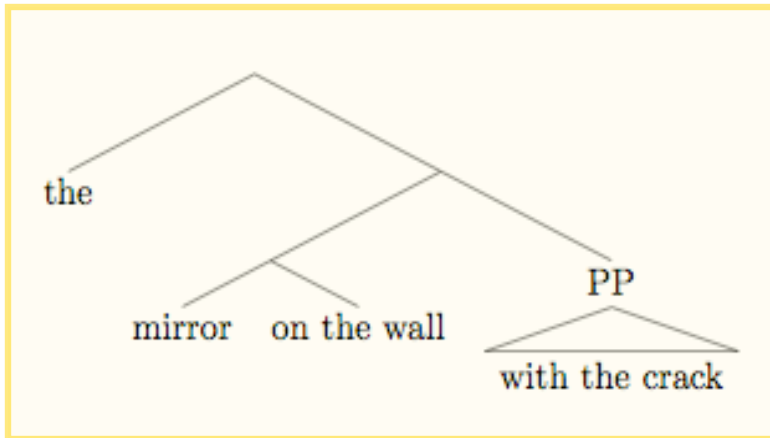
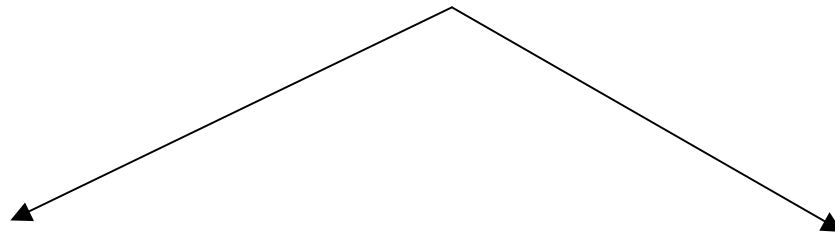
Priming in globally ambiguous sentences

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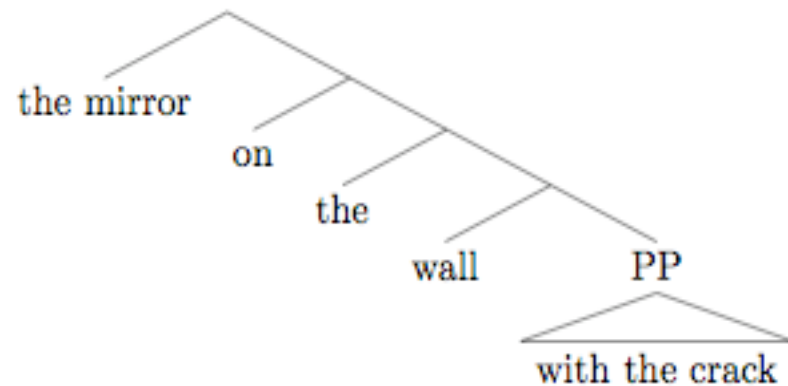


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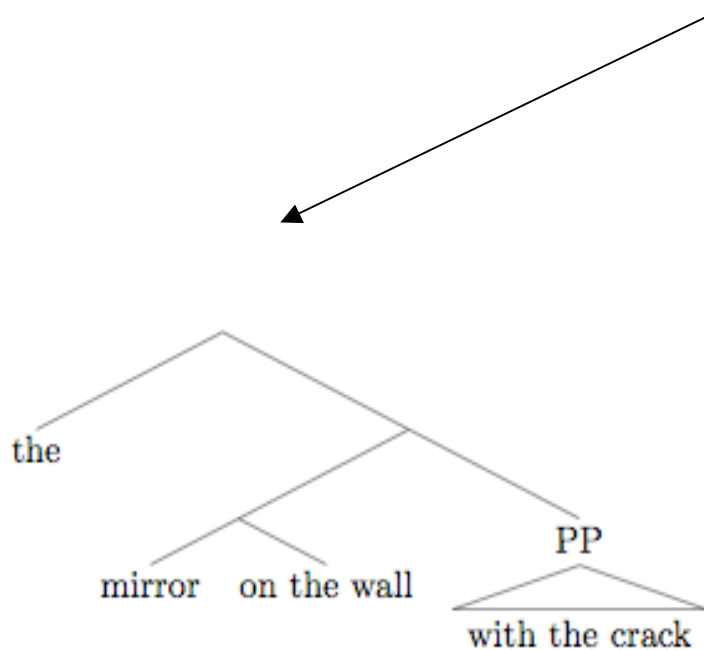
high attachment



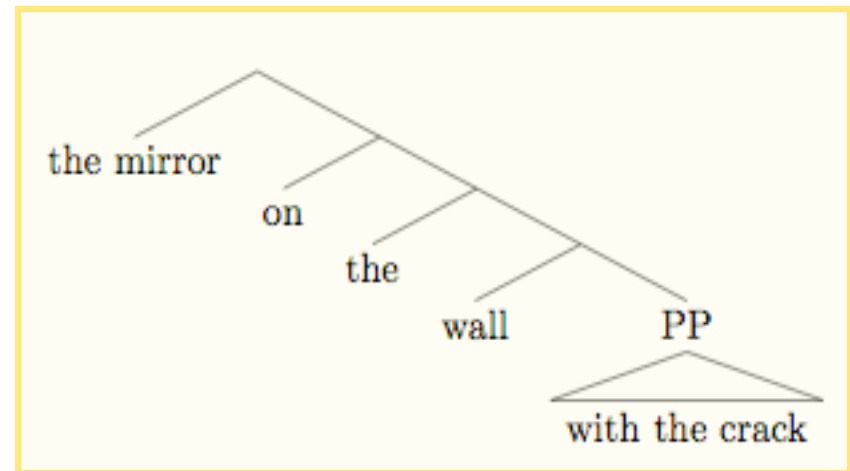
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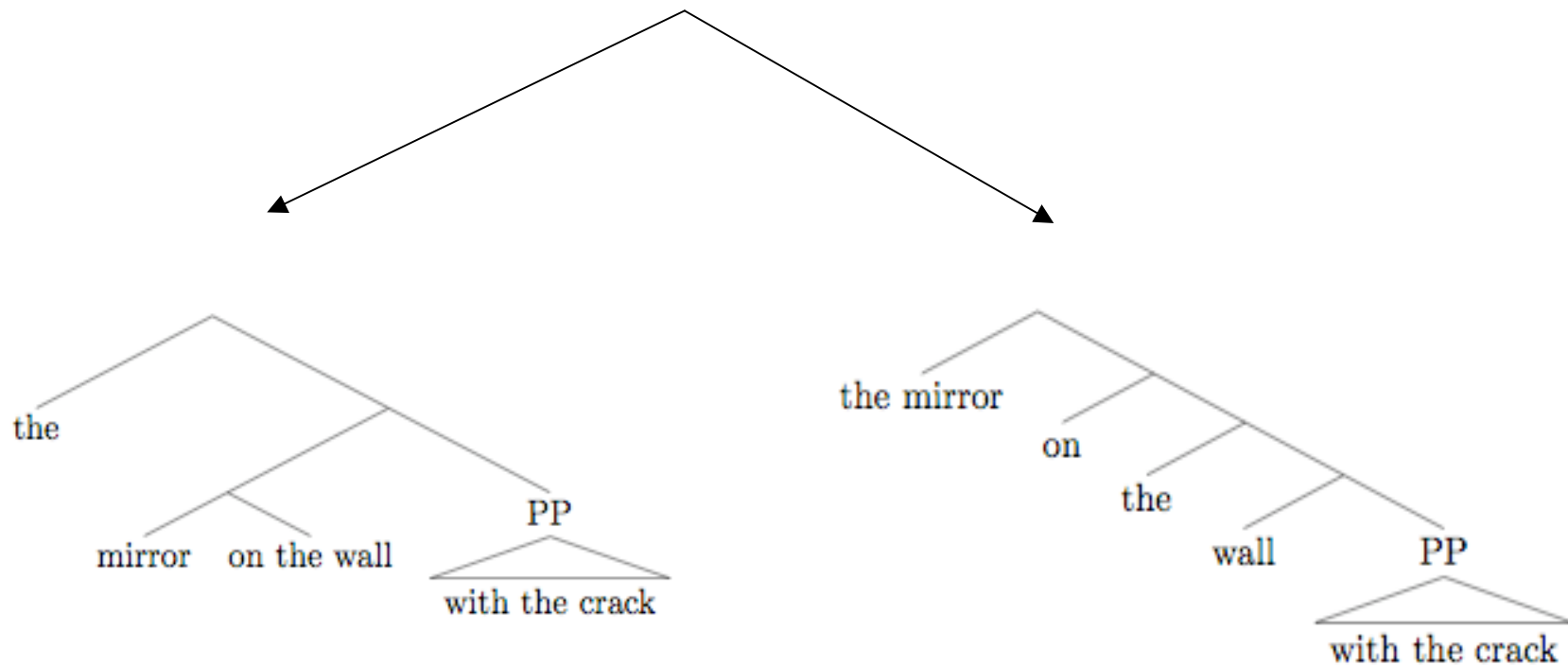


low attachment

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The kids were scared of the spider in the web with the fangs.

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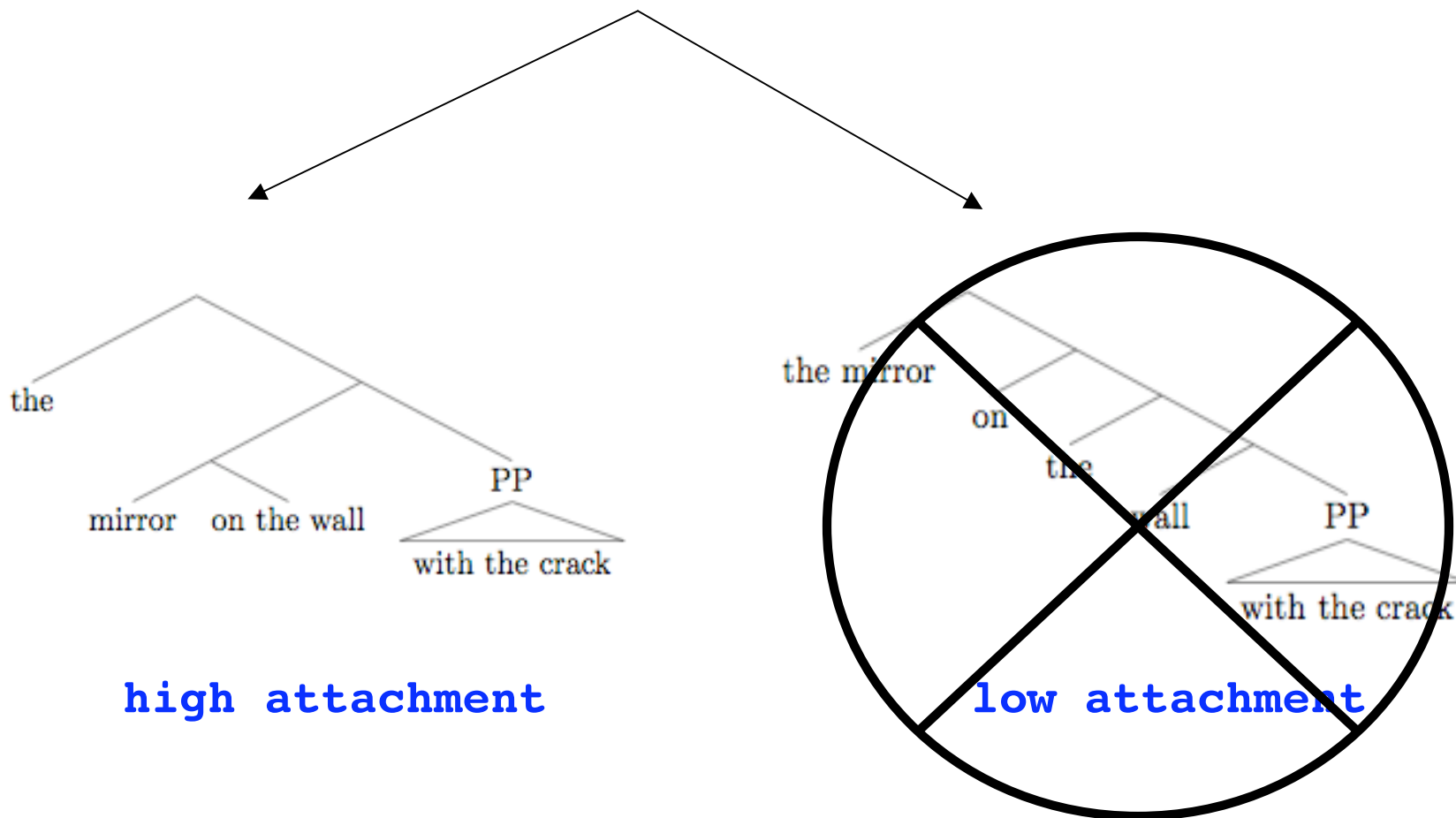
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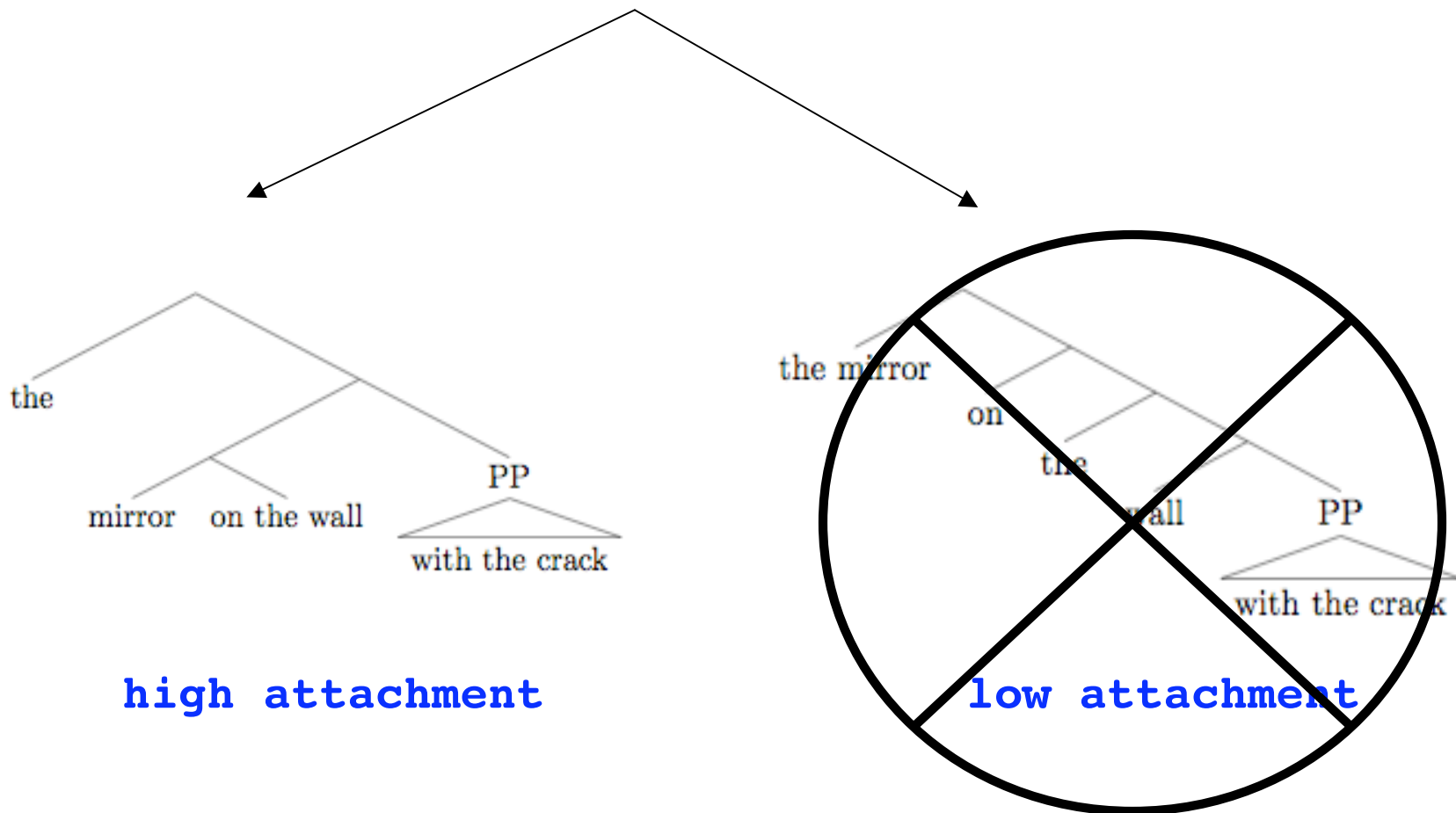
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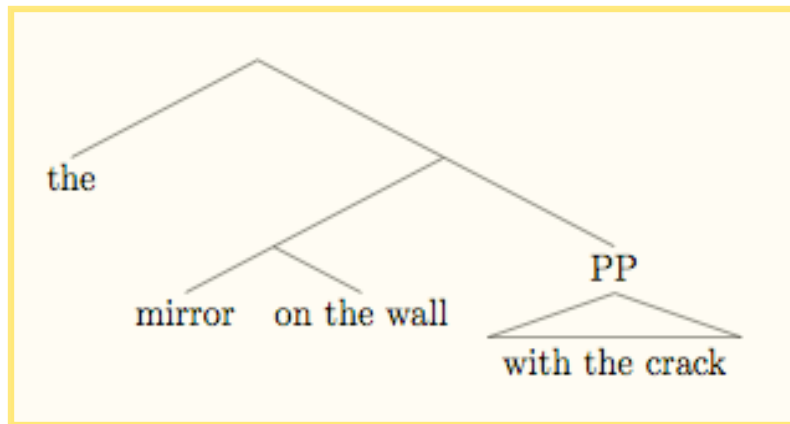
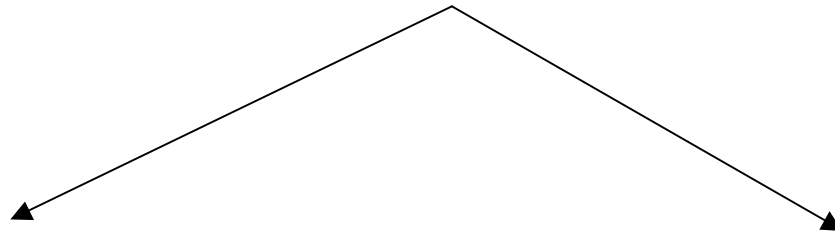
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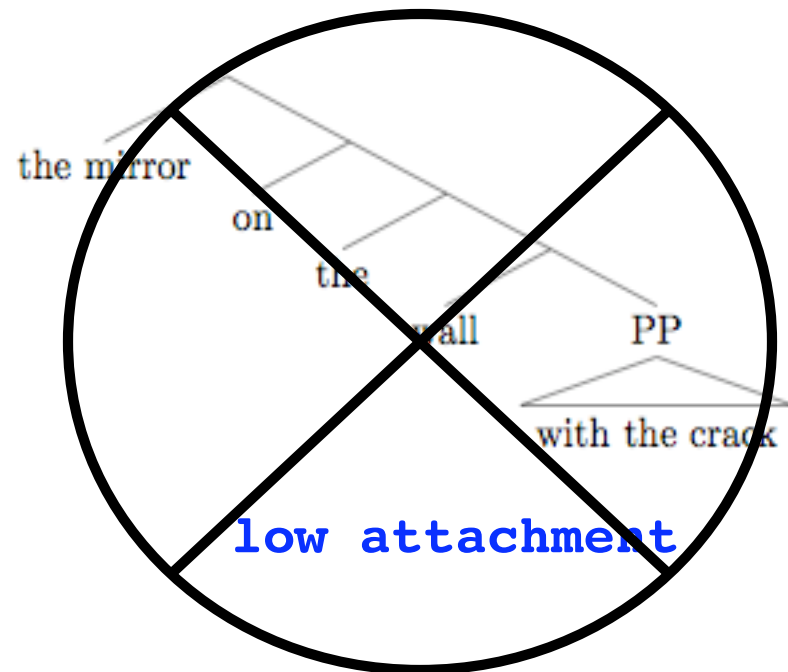
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- 1/2 experimental trials (prime or target), 1/2 fillers

The kids

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_____ scared _____

_____ by _____

the spider

_____ in _____

the web

with

the fangs.

The FBI agent



_____ noticed _____

the mirror

_____ on _____

the wall

with

the crack.

What had a crack?

(a) the wall (b) the mirror

Dependent measures

- Parse of target sentence--indicated by question response
- Reading time

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RTs and Question responses were fitted to mixed-effects regression models with Subject and Item as random effects.

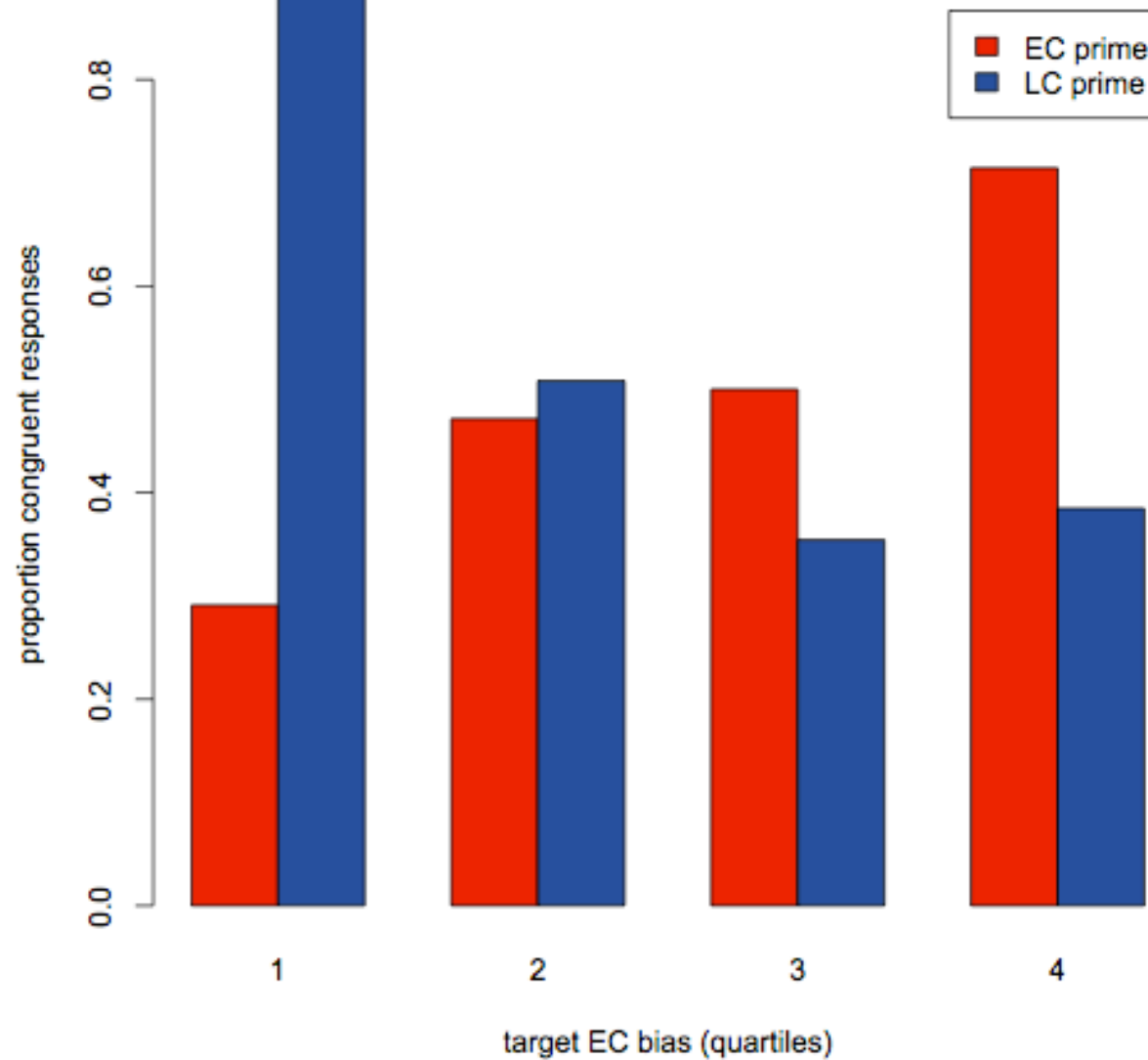
Results: question responses

- Main effect of preexisting *attachment bias* ($\beta=5.3$, $SE=1.0$, $p<.0001$): if an item has an Early Closure (high attachment) bias, it is more likely to be parsed with EC.

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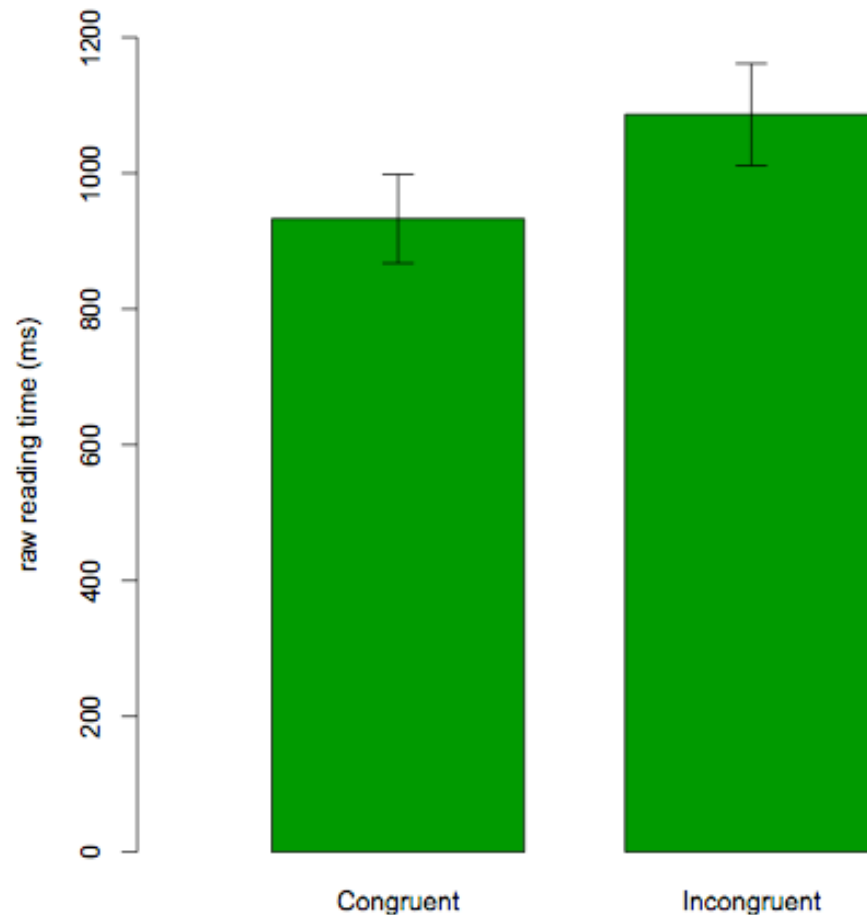
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- *Prime attachment x Trial number* ($\beta=.30$, $SE=.08$, $p<.0005$): LC primes become more effective as the experiment progresses (change in priming increases for more LC than EC primes).

Results: reading times

- Main effect of *Prime-Target congruence* ($\beta=280.3$, $SE=101.3$, $p<.01$): if the question response indicated a parse congruent with the prime, the ambiguously-attached PP was read faster.

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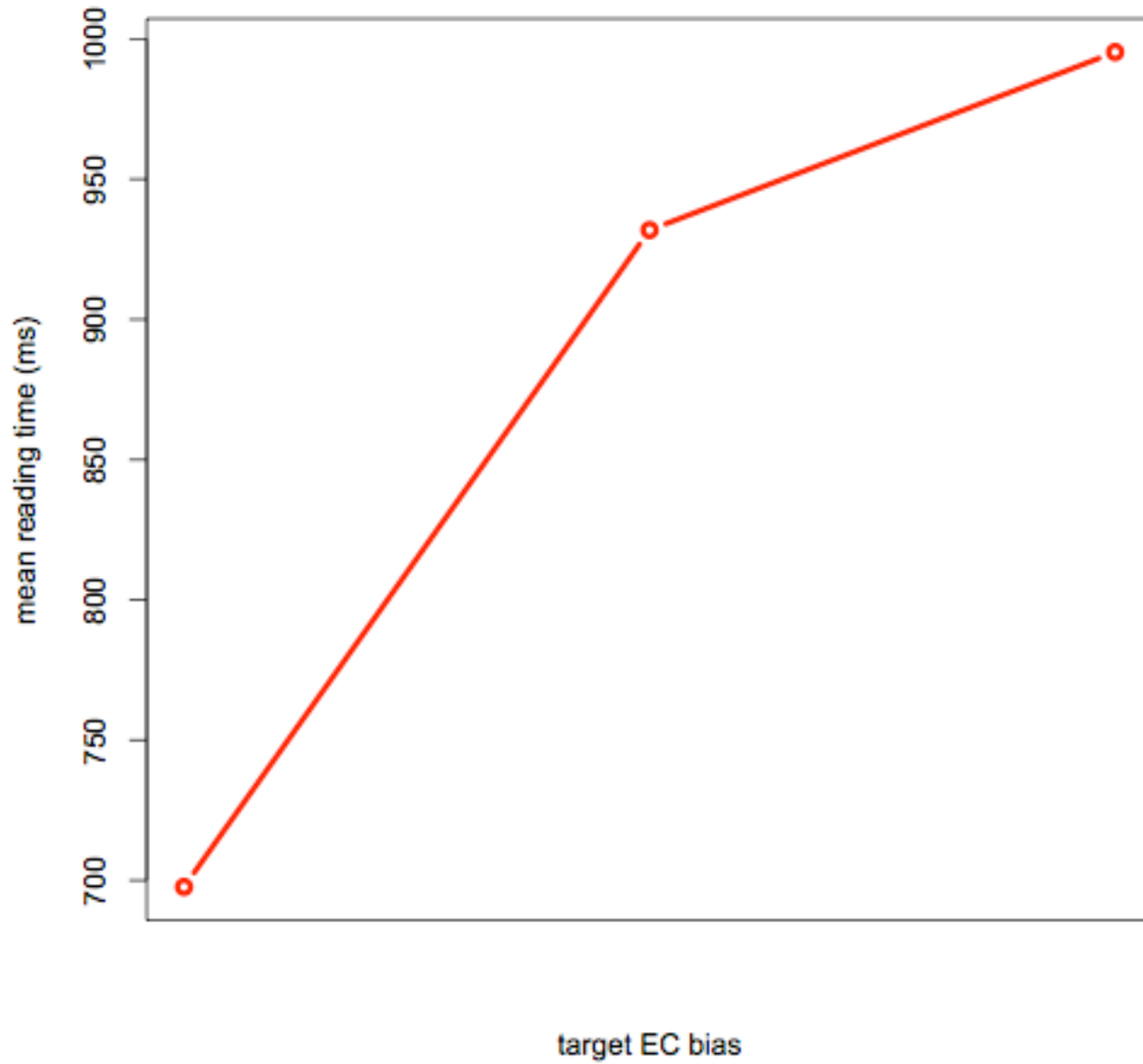
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- *Prime-Target congruence* x *Prime attachment* interaction ($\beta=295.9$, $SE=150.6$, $p=.05$): when the prime succeeded in affecting the parse of the ambiguous sentence, EC primes had a greater facilitative effect on RT than LC primes.

Conclusions

- Prior syntactic processing affects both interpretation and real-time processing of similar structures (even without lexical overlap).
- With a more level playing field between production and comprehension, the magnitude of syntactic priming effects are more comparable than previous studies have suggested.

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- Can get ‘overridden’ by new language experience: distribution of syntactic forms in input alters relative influence of prime types over the course of the experiment.
- Mechanism behind priming: how our ongoing experience processing syntactic forms (production and comprehension) is used to update processing biases.

Thank you!