Linguistic prediction is a non-competitive process:
Evidence from the processing of spoken sentences

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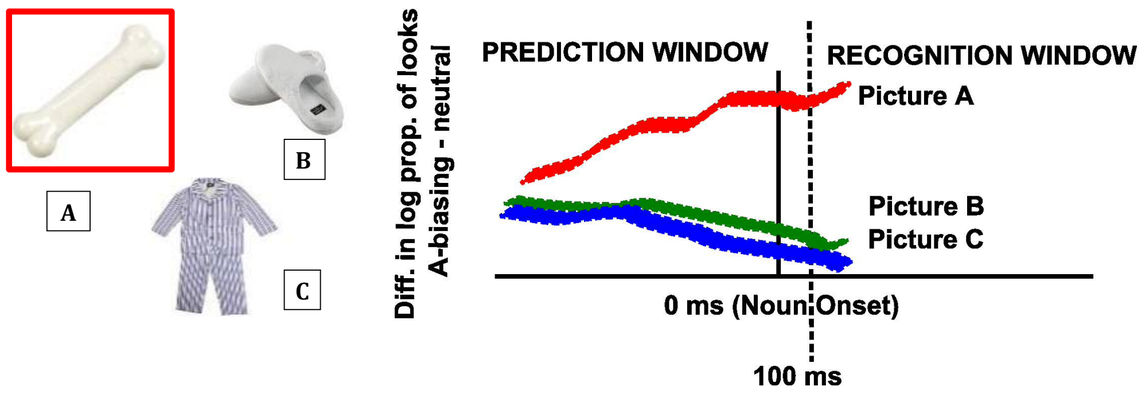
Background

1. How do people predict upcoming words?

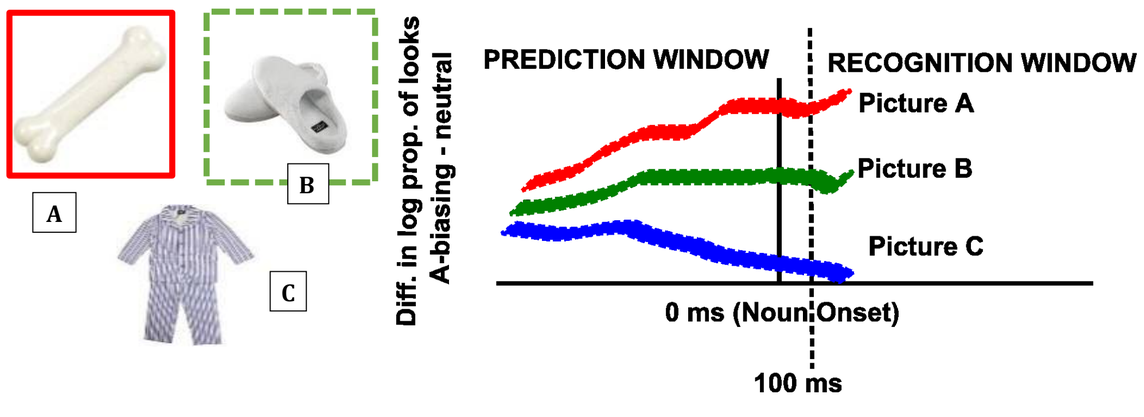
PREDICTION – AS – COMPETITION

A-BIASING: *Alfie's dog likes to chew on the ….*
Neutral: *Now, Craig is looking for the …*



NO – COMPETITION

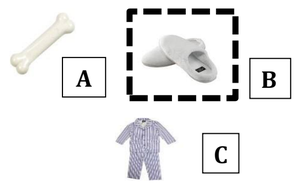
A-BIASING: *Alfie's dog likes to chew on the ….*
Neutral: *Now, Craig is looking for the …*

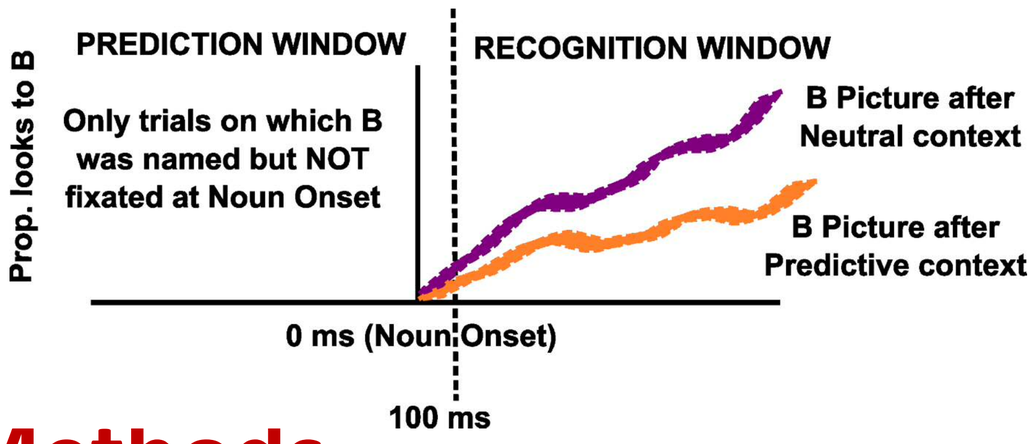


2. Is there a cost to disconfirmed predictions?

COMPETITION → RECOGNITION COST

Predictive: *Alfie's dog likes to chew on the ….* (A-Biasing) /
When you go to bed, you wear … (C-Biasing)
Neutral: *Now, Craig is looking for the …*





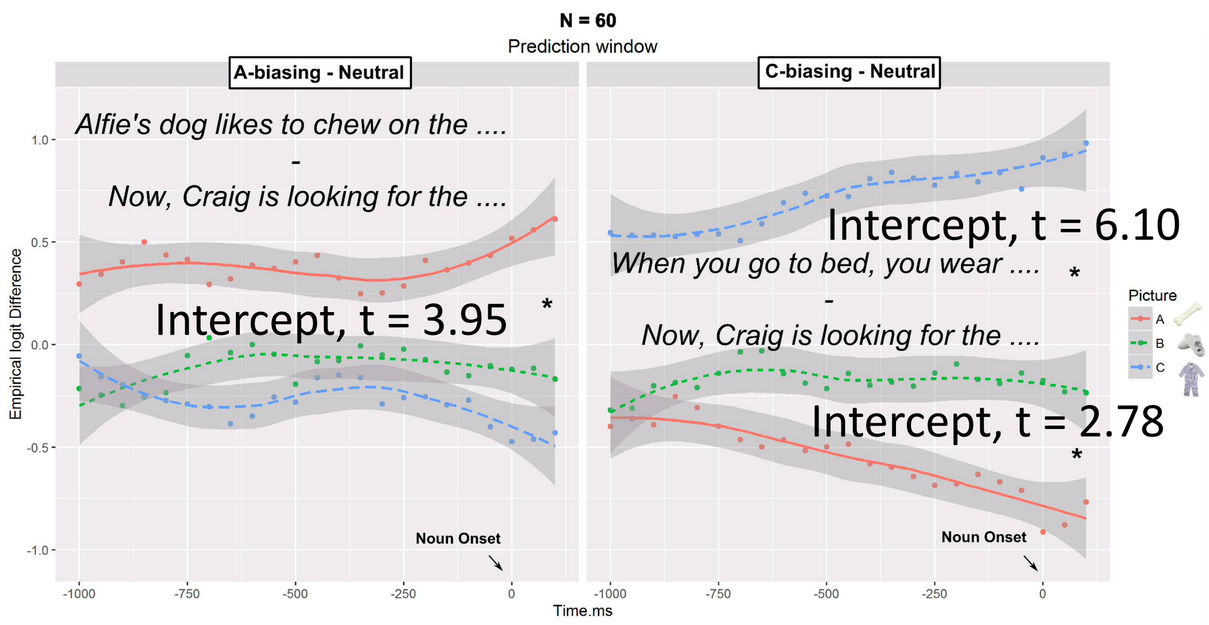
Methods

Context			Named		
			A	B	C
Predictive	A-biasing	Alfie's dog likes to chew on the …	bone	slippers	[Not tested]
	C-biasing	When you go to bed, you wear …	[Not tested]	slippers	pyjamas
Neutral	Neutral	Now, Craig is looking for the …	bone	slippers	pyjamas

60 native English-speaking adults (18-34, 18 males)
SMI Red-n Scientific at 30 Hz
15 items X 2 (across 2 blocks)

Prediction (1s before to 100ms after Noun Onset)

Growth Curve Analysis (Mirman, 2014) on empirical logit difference curves supports the No-Competition view.

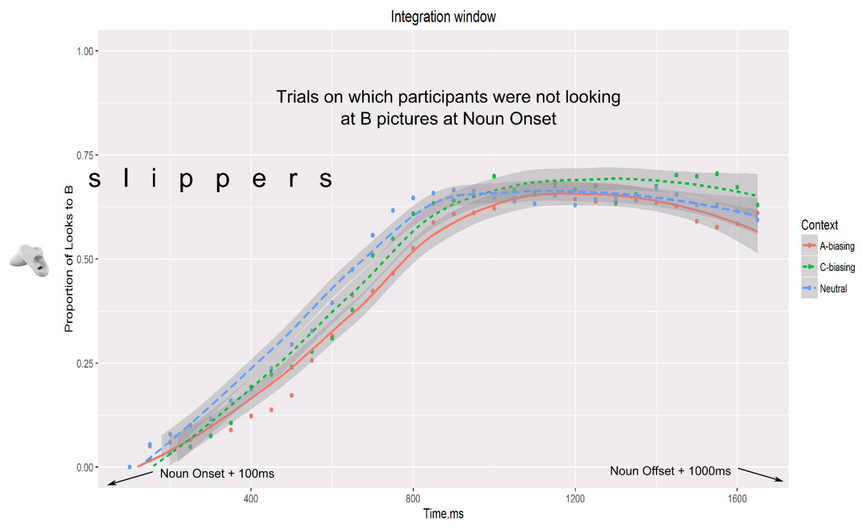


Combined:
High-mildly predictable: t = 6.02
Mildly-unpredictable: t = 2.74

→ Logistic regressions with by-participant and by-item random effects comparing looks to each picture across contexts confirm this pattern.

Recognition (100 to 400ms after Noun Onset)

No evidence for recognition costs.



Combined:
Intercept, t = -1.47
Slope, t = -1.14

Same results for extended recognition window (to 1s post Noun Offset)

→ Time to first fixation: 638ms (neutral) vs. 706ms (predictive), B = 59ms, SE = 41ms, **t = 1.43**

Conclusions

In line with eye-tracking while reading (Luke & Christianson, 2016), but *contra* some ERP evidence (e.g., Brothers et al., 2015)

Fits with Staub et al.'s (2015) model of timed Cloze task:

- independent race of alternatives.
- *overall* activation level of alternatives higher after predictive than neutral contexts.