Strong competitors facilitate target name retrieval in simple picture naming

(new British English timed picture naming norms for the International Picture Naming Project: http://pages.bangor.ac.uk/~pss238/lab/norms.html)

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What do we mean when we talk about "competitive" lexical selection? The core theoretical claim–used to explain a wide range of naming latency data (most notably Levelt, Roelofs, & Meyer, 1999)–is that the production system is hard-wired to choose **the single best word** in any situation (not just a good word), so selection takes longer as an alternative becomes more accessible. Thus priming an alternative, as in picture-word interference or cumulative semantic interference, ***causes*** delayed target name retrieval specifically by creating a single strong competitor. But directly manipulating competitor accessibility introduces confounds and alternative explanations for any apparent effects (for instance, CSI seems to mostly reflect implicit learning, and it is unclear if/how PWI relates to production). More generally, a theory of normal word retrieval should address retrieval under normal circumstances. **So what kind of evidence could tell us about the role of *endogenous* lexical competition in normal picture naming?**

✗ $RT_{DominantName} \sim p(DominantName)$?

Seriously? ANY theory can easily explain this, e.g. weak connections due to divided practice and/or unlearning.

✗ $RT_{DominantName} \sim$ [item 'Entropy'] ?

Entropy is basically just a transformation of p(DominantName), r =-.95

✗ $RT_{DominantName} \sim$ [# of distinct names] ?

No, merely measures dispersion, primarily counting errors.

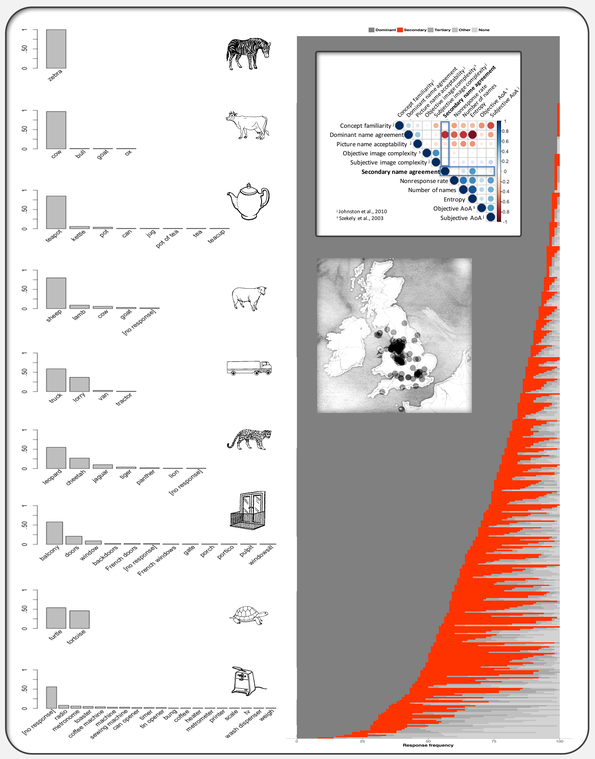
✓ $RT_{DominantName} \sim p(SecondaryName)$?

Yes, instead of simply indexing dispersion, a stronger competitor should provide more potent competition

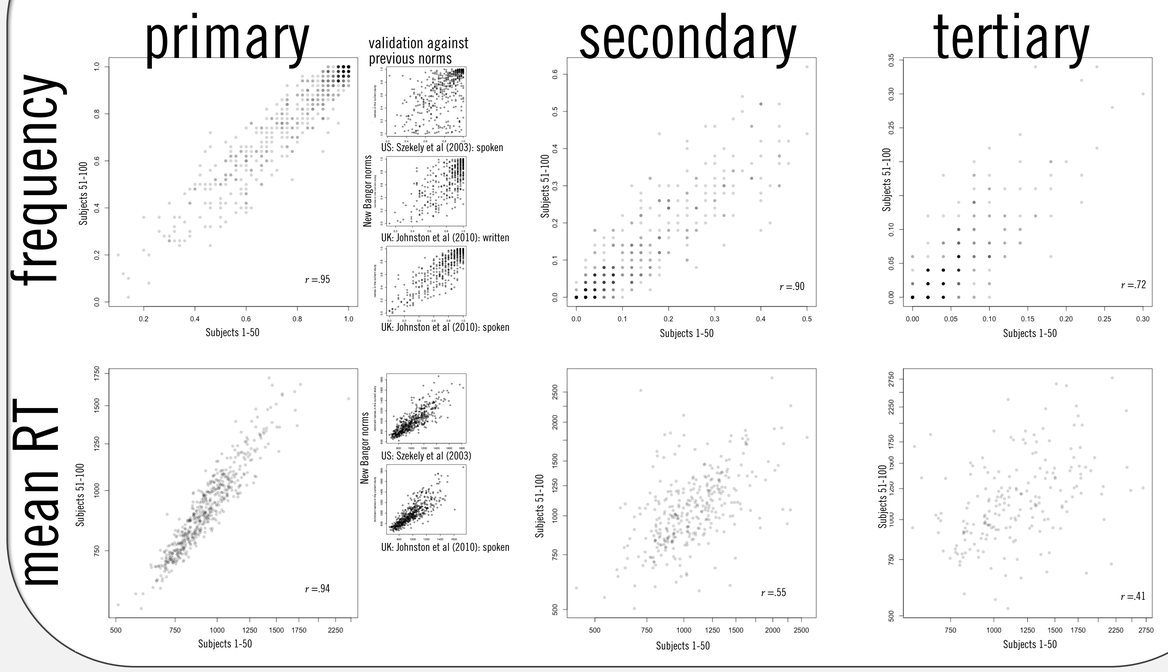
New British Norms for the IPNP

- 525 black and white line drawings of common objects (https://crl.ucsd.edu/experiments/ipnp/1stimuli.html)
- Two groups of 50 native-English-speaking Bangor University Psychology students (100 total)
- Standard IPNP timed picture naming norming protocol (Szekely et al, 2003; Bates et al, 2003)
  - Each picture presented once per subject, without feedback; brief rest after every 105 trials
- Improved pseudorandom stimulus sequencing minimises order effects
- Delayed-threshold voicekey robustly and accurately detects naming latencies

- Response tabulations collapse across singular/plural distinction, but nothing else
- All claimed results come out any way you squint at the data

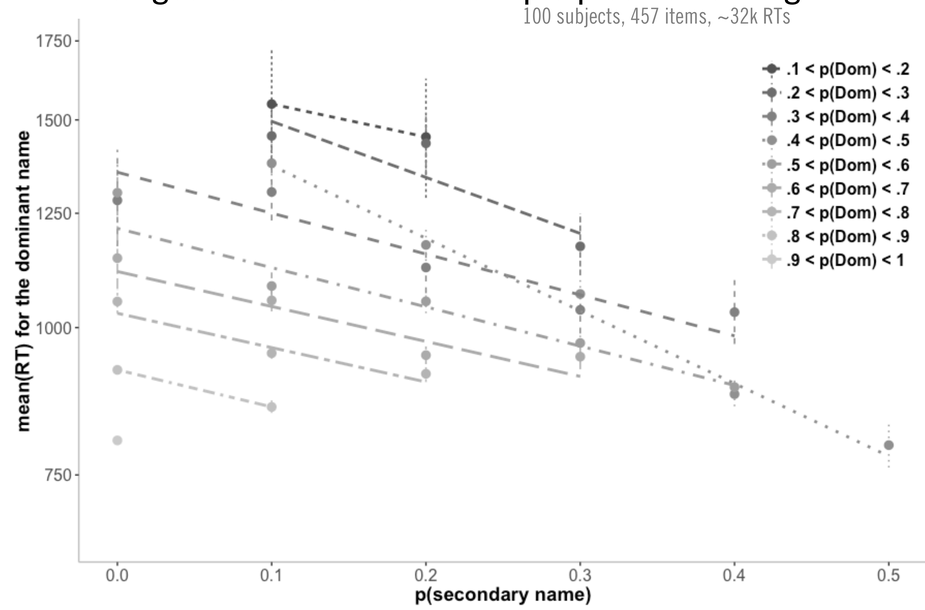


New norms reveal replicable distributions and RTs for primary, secondary, and even tertiary responses



Well, do strong competitors actually hinder target name retrieval in simple picture naming?

100 subjects, 457 items, ~32k RTs



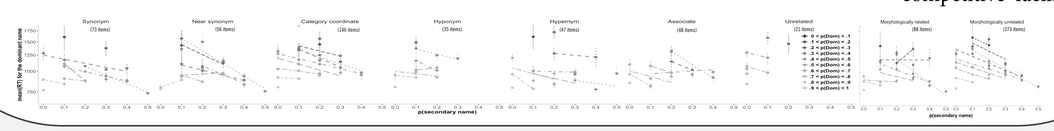
Dominant name agreement is associated with faster dominant name production (p<.001).

Secondary name agreement is *also* associated with faster dominant name production (p<.001).

Tertiary name agreement (not shown) is also associated with faster dominant name production (p<.01).

Effects neither reducible to response overlap, nor moderated by semantic (or visual) relations between 'competitor' and 'target'

By the same logic that previously interpreted longer RTs as evidence of competitive 'inhibition', shorter RTs would reflect competitive 'facilitation'



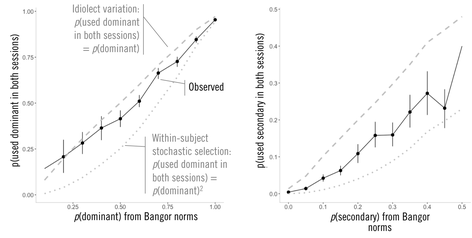
Bonus (from Balatsou, Fischer-Baum, & Oppenheim, 11:10 this morning)

Does competitive 'facilitation' actually reflect within-subject lexical processing?

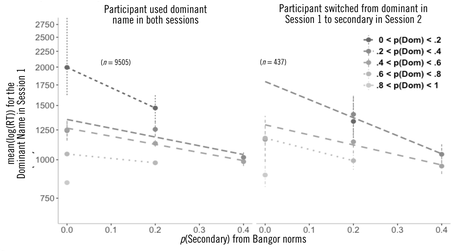
Because name agreement is typically estimated by collapsing across participants, any individual participant may not actually consider both options; some might be *truck* people, others *lorry* people. If strong alternatives do slow lexical access in normal production, then we'd have the best chance of seeing that inhibition by focusing on cases where an individual actually shows such variation (e.g. naming a picture as *truck* first, and later as *lorry*).

- 25 native-English-speaking Bangor University Psychology students
  - Standard IPNP timed picture naming norming protocol (Szekely et al, 2003; Bates et al, 2003)
  - Two sessions, 1-2 weeks apart; different stimulus orders in each
- Predict each individual's Session 2 response from:
  - Their Session 1 response (assumption: stable idiolect variation)
  - Previous Bangor IPNP norms (assumption: independent within-subject stochastic selection)

Norms *do* predict within-subject variation…

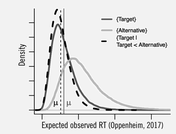


…but competitive 'facilitation' is at least as strong when participants consider both names



Conclusions

- This project provides the largest set of *timed* spoken picture naming norms for British English to date.
  - Good coverage of native English speakers from England and North Wales (cf Szekely et al's US norms for the same set)
  - Timed picture naming predicts timed picture naming (vs written norms from Johnston et al, 2010, and Duñabeitia et al, 2017)
- Secondary and tertiary name agreement provide stable measures of concentrated within-subject competition during picture naming
- But contra predictions for 'competitive' lexical selection, strong alternative responses are actually associated with faster target word production.
  - Not attributable to response overlap, nor apparently modulated by relations between candidate percepts or concepts
  - Holds even (especially) when individuals demonstrably use both names
  - May reflect facilitation within a semantic neighbourhood (e.g. via feedback), and/or a noncompetitive censoring process (e.g. Oppenheim, 2017)
  - Any tendency for competition to delay normal production must be very weak
  - Previously claimed evidence for competition-based delays in norms or from name agreement manipulations must be ascribed to other processes



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