



The effects of frequency and predictability on the recognition of *up* in English

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Introduction

- What is stored in the lexicon?
 - Words, idioms.
 - Phrases?
- Frequency → Storage
 - High frequency phrases are more phonologically reduced:
 - I don't know.*
 - Harder to recognize components of high-frequency items:
 - pick up.*
- Predictability → Storage?
 - Harder to recognize components?
 - summed up*

Present Study

- What drives storage?
 - Is it harder to recognize *up* in high-predictability phrases?
 - i.e., do we see a U-shaped effect?
 - Can we replicate the effect of frequency?
- what are the processing consequences of storage?

Methods

- Extension of Kapatsinski & Radicke, (2009).
 - Presented with sentences that contained V+*up* phrases.
 - Pressed a button when they heard *up*.
- Phrasal verbs varied in frequency and predictability.

Analysis

- Generalized Additive. Mixed effects models as
- Bayesian quadratic models.
- These methods allow us to account for nonlinear effects.

Results

- U-shaped effect for both frequency and predictability, suggesting storage for high-frequency and high-predictability items.
 - As frequency/predictability increases, participants get faster and faster, until reaching the highest frequency/predictability items.
- Our results suggest that high frequency and high predictability items are stored.
- These items seem to lack internal representation.
 - Increased recognition times.

Fig 2. A visualization of our Bayesian quadratic model results. The model suggests a u-shaped effect of both frequency and predictability.

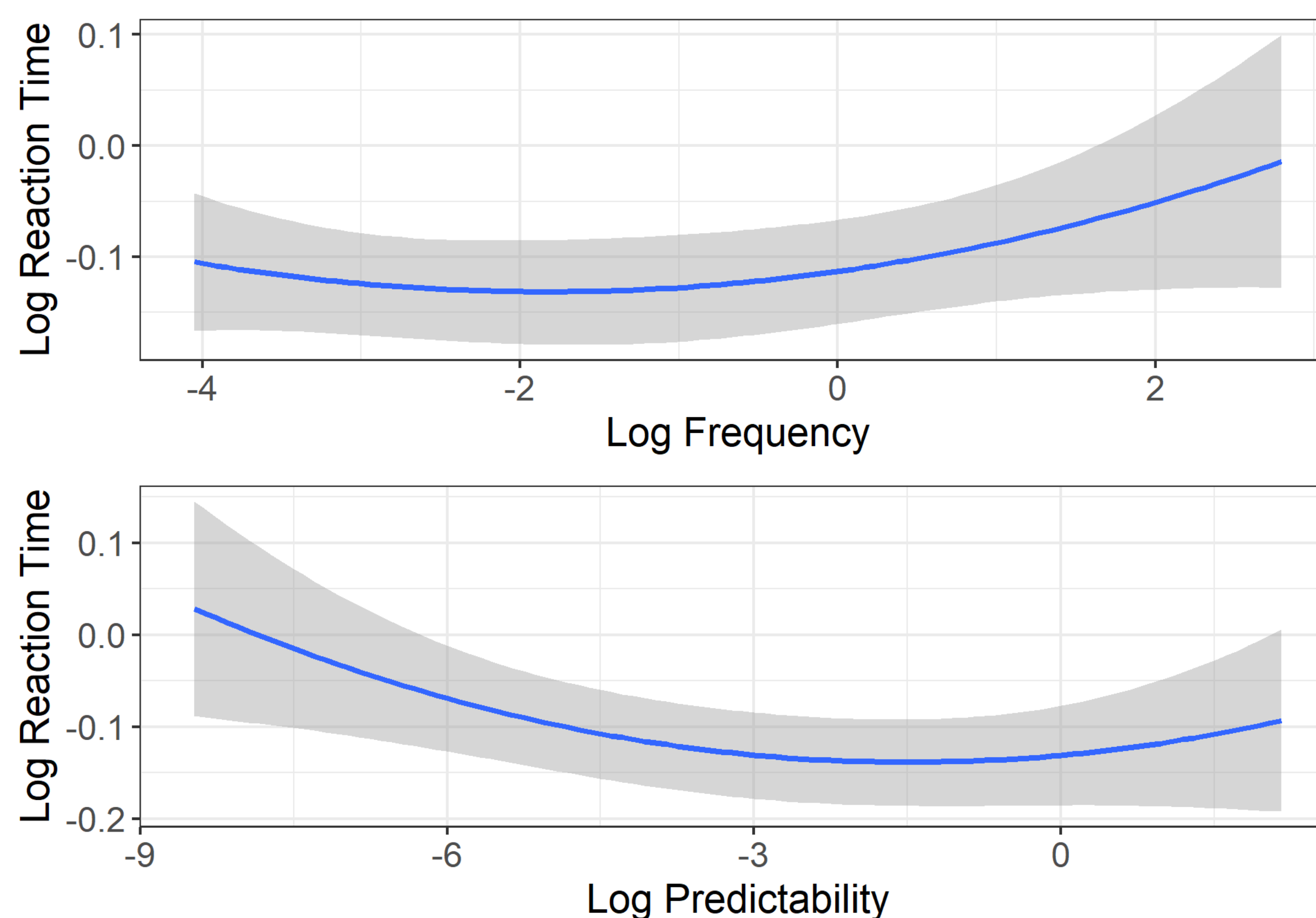


Fig 3. Results from Kapatsinski & Radicke (2009)

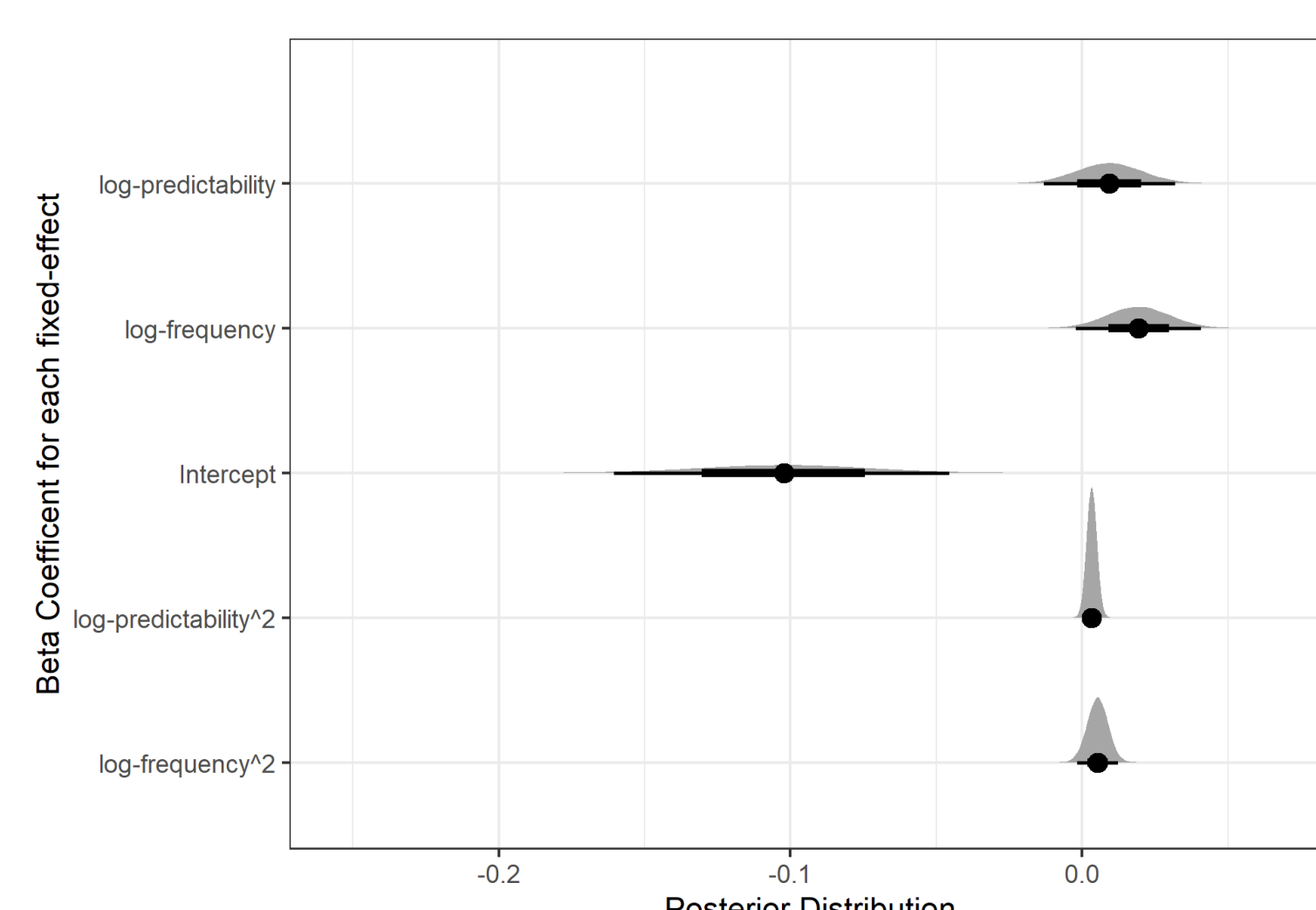
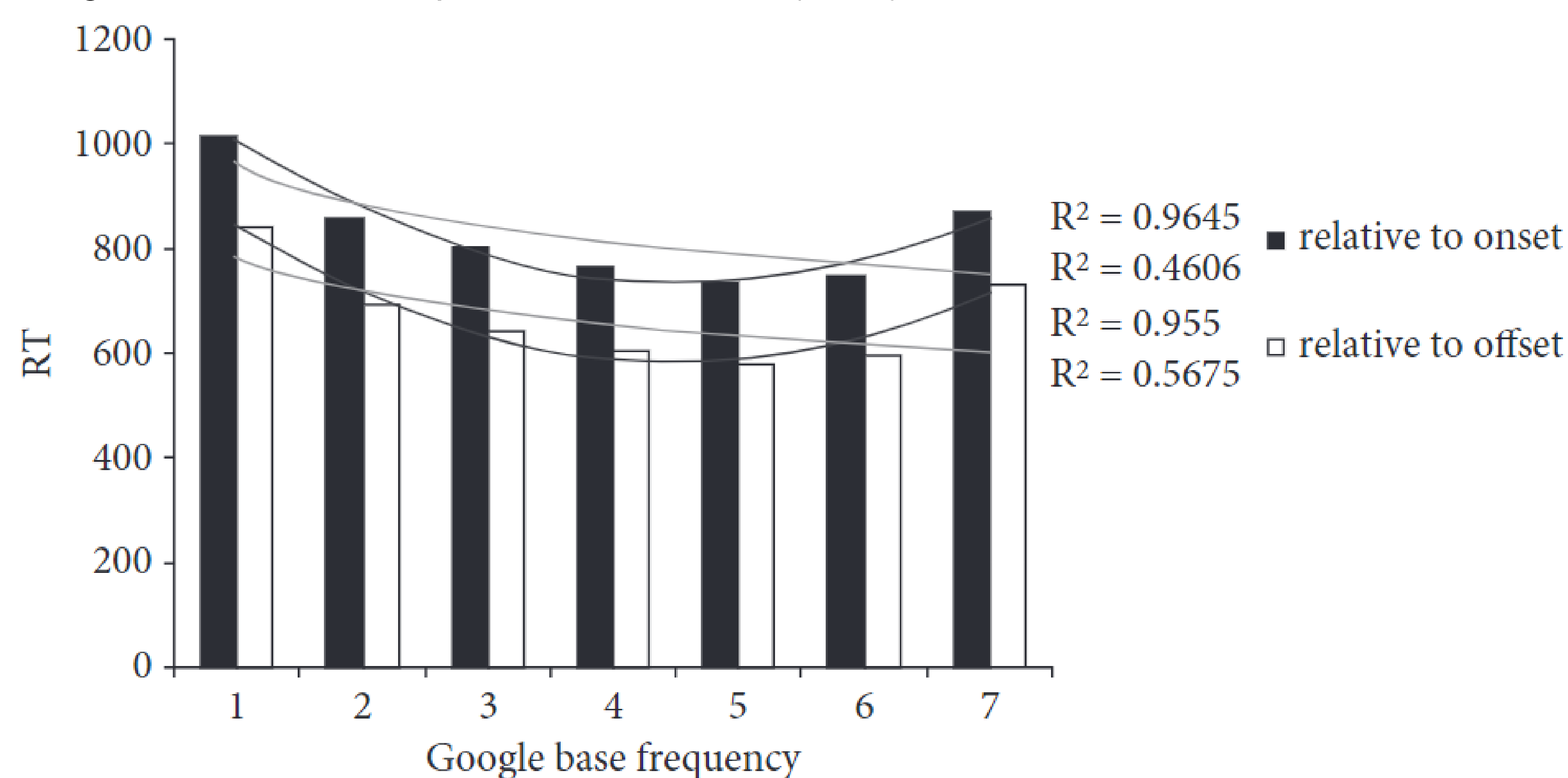


Fig 4. The posterior distribution for our quadratic model.

Summary

- Both frequency and predictability drive storage.
- Stored items may lack internal representation (Figure 1, right side).
- One possibility is that experience with the items over time results in a loss of internal structure.
 - Maybe due to learning mechanisms.
- Another possibility is that the internal structure was never present to begin with.
 - Maybe due to word-segmentation processes.

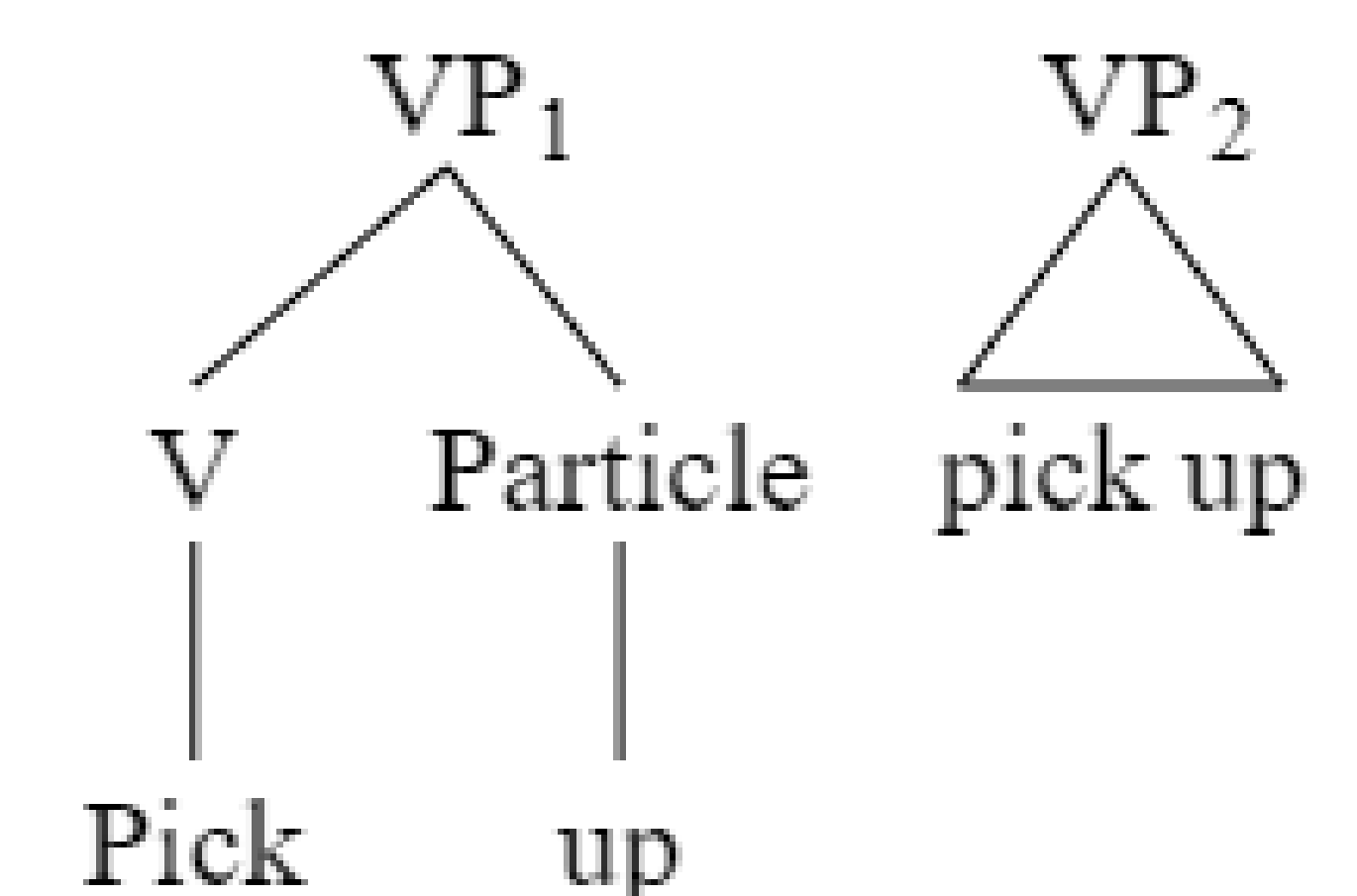


Fig 1. Two possible representations of holistic storage. The left represents internal structure intact.

Future Work

- Examining how the lack of internal structure arises.
 - Artificial language paradigm.
 - Word-segmentation computational models.

References

- Bybee, J. (2003). *Phonology and language use* (Vol. 94). Cambridge University Press.
- Kapatsinski, V., & Radicke, J. (2009). Frequency and the emergence of prefabs: Evidence from monitoring. *Formulaic language*, 2, 499-520.