Perceptual Disfluency and Recognition Memory:A Response Time Distributional Analysis

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Introduction

- Perceptual disfluency can act as a desirable difficulty

Theoretical Accounts

Account	Description	Loci
Meta-cognitive	Perceptual disfluency affects meta-cognitive processes via increased system 2 processing	Post-lexical
Compensatory-processing	Perceptual disfluency affects the word recognition process	Lexical
Stage-specific	Disfluency relies on (1) the stage or level of processing tapped by the task and (2) monitoring and control processes	Lexical and Post-lexical

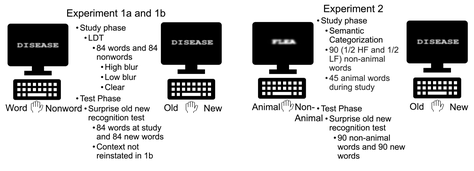
Problem: Traditional methods (e.g., mean RTs) make to hard to investigate underlying mechanisms

Goals

- Examine the disfluency effect with differing levels of disfluency
- Apply distributional (ex-Gaussian) and computational (diffusion modeling) analyses to study underlying mechanisms of the disfluency effect

General Methods

Experiment	N
Experiment 1a	216
Experiment 1b	216
Experiment 2	435



Experiment 1a and 1b

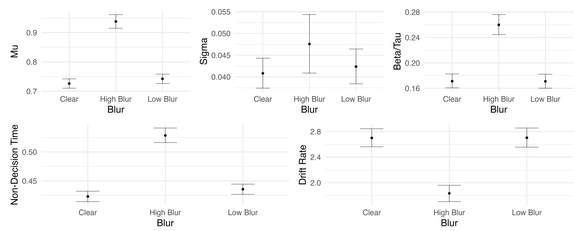
Results from 1b were virtually identical and thus not reported

RTs

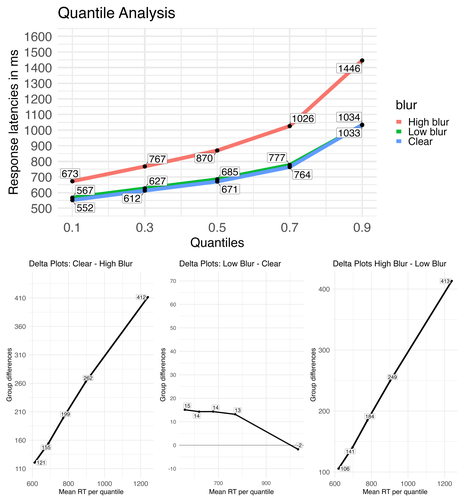
- Predictions

Account	Ex-Gaussian	Diffusion.Model
Metacognitive	τ: incresaed skewing	decreased drift rate
Compensatory	τ: increased skewing	decreased drift rate
	μ: increased shifiting	increased ndt
Stage-specific	τ: increased skewing	decreased drift rate
	μ: increased shifiting	increased ndt

Ex-Gaussian and Drift



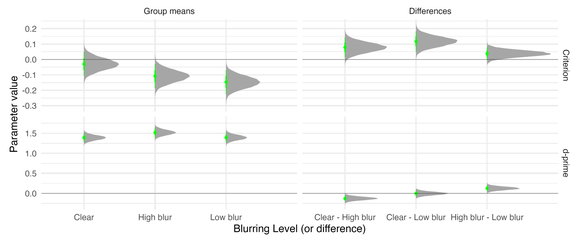
Quantile Plots



- **High blurred words showed increased skewing τ and shifting μ, lower drift, and higher ndt compared to low blurred and clear words**
  - **Low blurred words only affected the μ and ndt**
- **Results consistent with compensatory and stage-specific accounts**

Memory

- Predictions
  - High blur words will show a disfluency effect
- Results

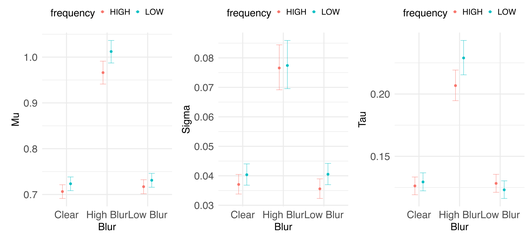


- **High blur words better remembered than low blurred and clear words**

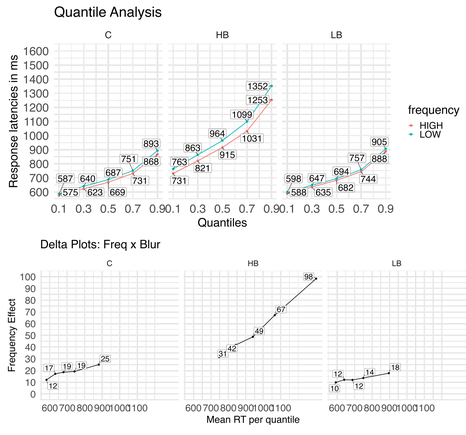
Experiment 2

- The findings from Experiment 1 do not adjudicate between compensatory and stage specific account
- Here we look at a lexical factor known to interact with perceptual disfluency: Word Frequency
  - Compensatory processing account predicts better memory for low frequency words
  - Stage-specific account predicts better memory for high frequency words

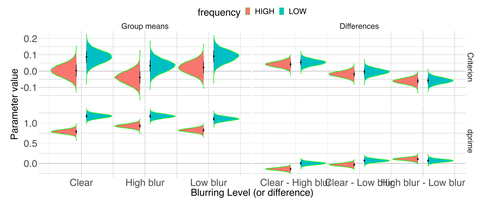
Ex-Gaussian



Quantile Plots



Memory



- Better memory for low frequency words
- Better memory for high blurred words
- High frequency-high blurred words better remembered

Conclusion

- All disfluency is not equal!
  - High blurred words showed different distribution pattern than low bur words
    - High blurred words showed disfluency effect at test
- Support for compensatory processing account (Ptok et al. 2019)
  - Memory was better for high frequency High blurred words
  - No effect for low frequency words
- Distributional and Computational modeling can be a useful tool to examine conflict encoding effects like perceptual disfluency

References

Ptok, Melissa J., Sandra J. Thomson, Karin R. Humphreys, and Scott Watter. 2019. "Congruency Encoding Effects on Recognition Memory: A Stage-Specific Account of Desirable Difficulty." *Frontiers in Psychology* 10: 858–58. https://doi.org/10.3389/FPSYG.2019.00858.