Challenges in Measuring the Influence of Perceptual Fluency on Judgments of Learning (JOLs)

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Background and Rationale

Judgments of learning (JOLs) refer to individuals' predictions of future memory performance based on their evaluation of prior learning.

Increased *perceptual fluency* (i.e., subjective ease of processing) has been shown to inflate individuals' JOL ratings.

Experience-based influences: JOLs can be impacted by in-the-moment processing experiences that reflect properties intrinsic to experimental stimuli (i.e. perceptual fluency).

Theory-based influences: JOLs can be impacted by deliberate applications of prior knowledge or beliefs concerning how a given experimental manipulation affects memory performance (i.e. a belief that more fluent stimuli are easier to remember).

Experiment 1

- Creating a manipulation of perceptual fluency that participants are unaware of
- Allows for examination of an exclusively experience-based influence of perceptual fluency on JOLs
- Any observed influences cannot be attributed to intuitive theories

Experiment 2

a. Increasing the saliency of the perceptual fluency of the primed letter set using a 2-AFC procedure could prompt participants to use perceptual fluency as a cue to guide their judgments

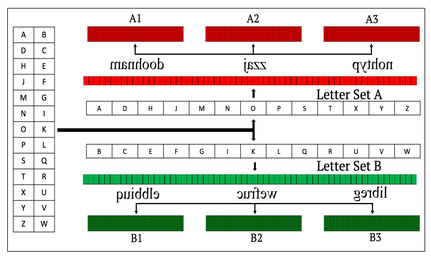
b. Adding the pronunciation requirement and sequential presentation will show that the lack of these requirements are not essential for using perceptual fluency when making JOLs

c. Removing the pronunciation requirement will show that it is not the sequential presentation

Experiment 3

- Removing pronunciation requirement may allow participants to use the increased perceptual fluency to guide traditional JOL ratings

Methods and Procedure

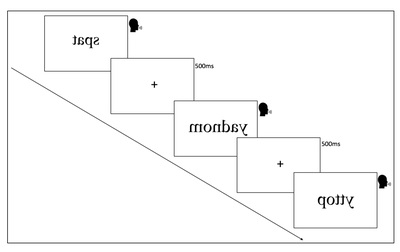


Training Phase
(6 blocks; 30 trials each)

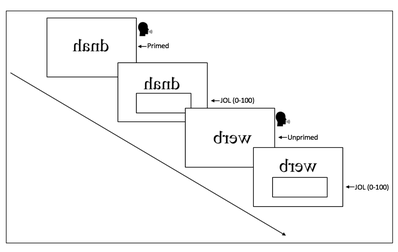
JOL Phase

Recall Phase

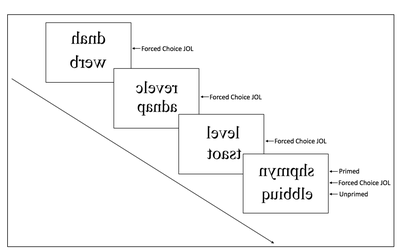
Training Phase



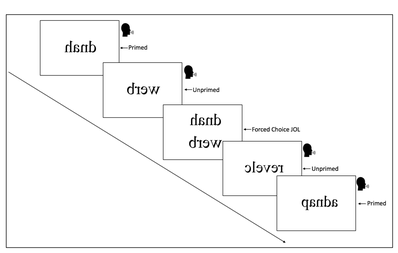
JOL Phase Experiment 1



JOL Phase Experiment 2a

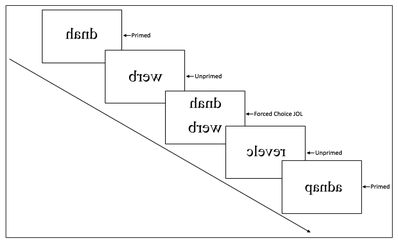


JOL Phase Experiment 2b

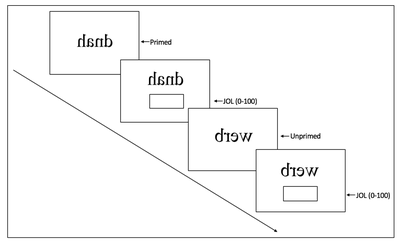


Methods and Procedure Cont'd

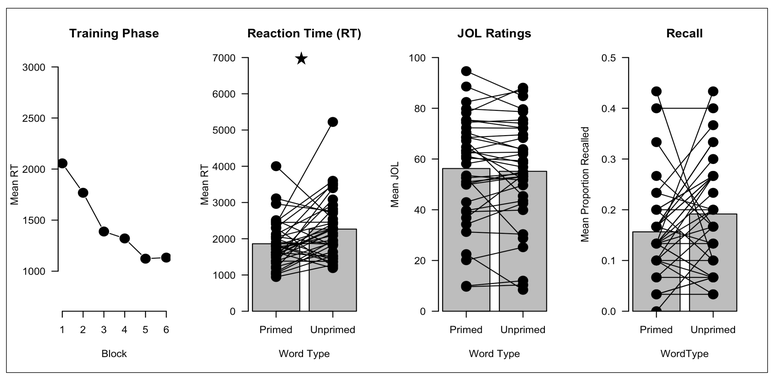
JOL Phase Experiment 2c



JOL Phase Experiment 3



Results – Experiment 1 (n = 36)



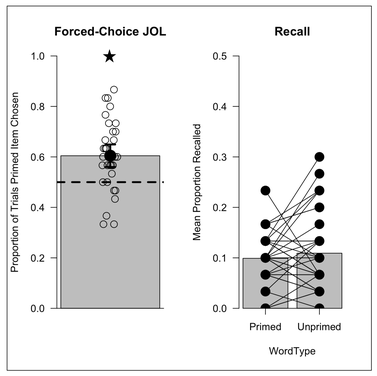
Significantly faster RTs in block 6 vs. block 1 of the training phase
- $t(35) = 6.24$, $p < .001$, $d = 1.18$

Significantly faster RTs for primed vs. unprimed words
- $t(35) = 2.76$, $p = .005$ (one-tailed), $d = .54$

Non-significant difference between JOL ratings for primed vs. unprimed words
- $t(35) = .81$, $p = .42$, $d = .05$

No significant difference in the proportion of primed and unprimed words recalled
- $t(35) = 1.84$, $p = .07$, $d = .35$

Results – Experiment 2a (n = 36)

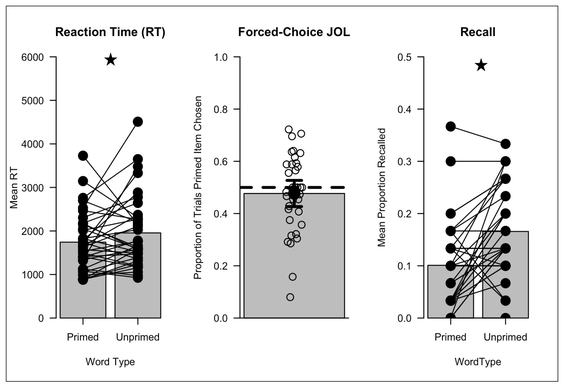


Primed words chosen at above-chance level performance (~60%)
- $t(35) = 4.77$, $p < .001$, $d = .76$

No significant difference in the proportion of primed and unprimed words recalled
- $t(35) = .86$, $p = .39$, $d = .16$

Results – Experiment 2b (n = 36)

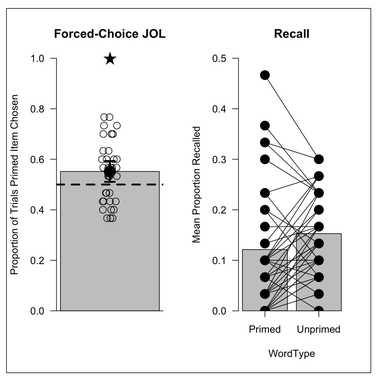
Significantly faster RTs for primed vs. unprimed words
- $t(35) = 1.72$, $p = .045$ (one-tailed), $d = .28$



Non-significant difference between proportion of times primed word chosen and chance level
- $t(35) = .94$, $p = .35$, $d = .16$

Significantly more unprimed words recalled
- $t(35) = 4.46$, $p < .001$, $d = .78$

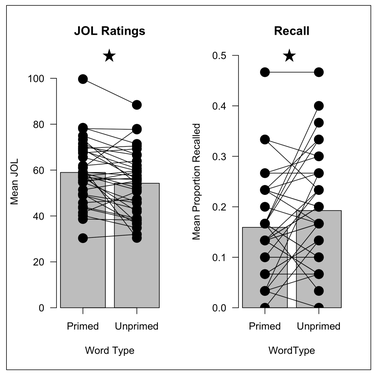
Results – Experiment 2c (n = 36)



Primed words chosen at above-chance level performance (~55%)
- $t(35) = 2.55$, $p = .007$, $d = .42$

No significant difference in proportion of primed and unprimed words recalled
- $t(35) = 1.96$, $p = .059$, $d = .31$

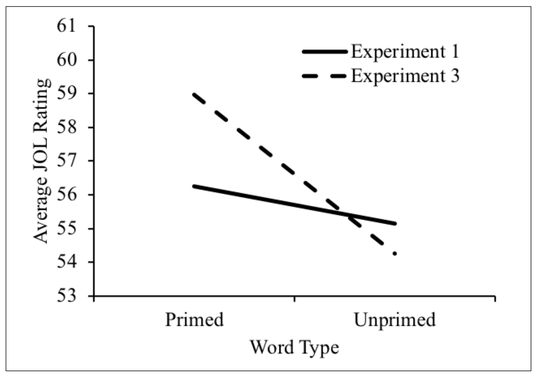
Results – Experiment 3 (n = 36)



Significantly greater JOL ratings given for primed vs. unprimed words
- $t(35) = 3.23$, $p = .003$, $d = .34$

Significantly more unprimed words recalled
- $t(35) = 2.18$, $p = .036$, $d = .32$

Interaction between JOL Ratings in Exp. 1 and Exp. 3



Interaction was trending *
- $F(1, 70) = 3.29$, $p = .074$, $\eta_p^2 = .04$

Bayesian analyses demonstrated that the null hypothesis was moderately supported in Experiment 1
- $BF_{10} = .24$

and the alternative hypothesis was very strongly supported in Experiment 3
- $BF_{10} = 13.04$

*After increasing power by replicating Experiment 1 and combining the data, the interaction was significant
- $F(1, 106) = 6.38$, $p = 0.13$, $\eta_p^2 = .06$

Conclusions

- Perceptual fluency can influence predictions of future memory performance
- Task requirements are important to consider when investigating how individuals make JOLs
- The act of measuring perceptual fluency may change how it is used to inform JOLs

References

Fiacconi, C. M., Mitton, E. E, Laursen, S. J., Skinner, J. (in review). What's in a name?: Isolating the Contribution of Perceptual Fluency to Judgments of Learning. *Journal of Experimental Psychology: Learning, Memory, and Cognition*

Koriat, A. (1997). Monitoring one's own knowledge during study: A cue-utilization approach to judgments of learning. *Journal of Experimental Psychology: General*, 126(4), 349-370. doi:10.1037/0096-3445.126.4.349