

Masked Prime Stimulus Awareness Assessed with Identification Accuracy and the Psychological Refractory Period (#5023)

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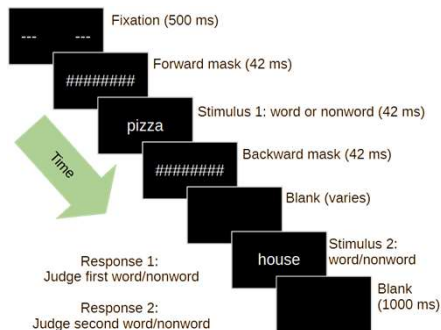
Introduction

Assessment of masked stimulus awareness can take a variety of approaches: self-reports, direct tasks (e.g., prime identification), and rating scales (e.g., Perceptual Awareness Scale). Unfortunately, all of these methods have shortcomings. Self-reports (e.g., "I saw it!") provide evidence of subjective experience, but are less sensitive than direct tasks.

The present experiments combine masked stimulus identification (a direct task) with the Psychological Refractory Period (PRP; Pashler, 1994) in a hybrid paradigm. An exploratory hypothesis is that a combination of masked prime identification with the PRP effect would yield new insights into prime stimulus awareness in masked priming experiments.

Method

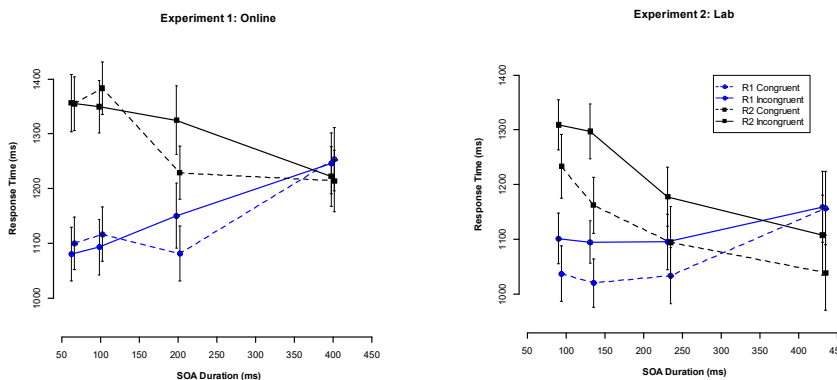
Figure 1. Experiment 1 display and responses



Two similar experiments were conducted on different platforms: PsyToolkit (online; Stoet, 2010, 2017) and E-prime (traditional laboratory testing). Young adult participants viewed a randomly chosen masked word or nonword stimulus (S1) followed by a second word or nonword stimulus (S2; Figure 1). The stimulus onset asynchrony (SOA) of S1 and S2 was varied: E1 - 64, 100, 200, and 400 ms; E2 - 92, 133, 233, and 433 ms. The first response (R1) was a time-urgent lexical judgment of S1 with the left hand. The right hand was used for the second time-urgent lexical decision (R2).

Results

#1. Large PRP effects occurred in both experiments.



#2. R1 (masked prime) identification accuracy decreased at shorter SOAs.

Experiment 1: online $F(3, 93) = 2.83, p = .043, \text{partial } \eta^2 = .084$
Experiment 2: lab $F(3, 78) = 7.012, p < .001, \text{partial } \eta^2 = .212$

#3. Priming congruency effects were significant at some SOAs (paired t-tests; $\alpha = .05$).

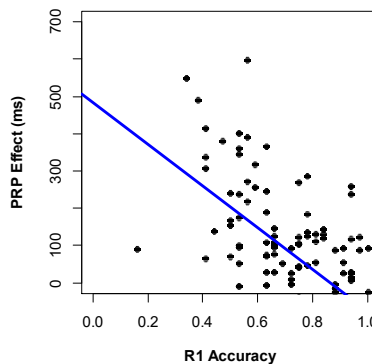
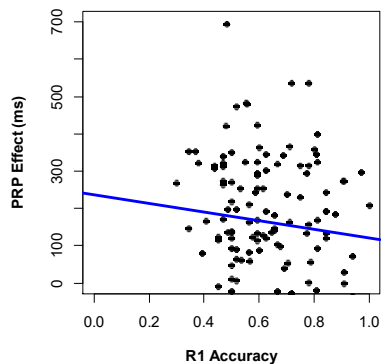
Experiment 1: online
R1: 200 ms
R2: 200 ms

Experiment 2: lab
R1: 93, 133, 233 ms
R2: 93, 133, 233 ms

#4. Correlation in Exp. 2 between R1 (masked prime) identification accuracy and PRP effects.

$r = -.11, p = .22$
Experiment 1: Online

$r = -.53, p < .001$
Experiment 2: Lab



Discussion

Decreases in prime identification accuracy may be associated with larger PRP effects. Trials with uncertain perceptual states cause both lower accuracy and a slight hesitation from greater effort, possibly due to a common processing bottleneck.

Null awareness was not achieved in either experiment. An open possibility is that the PRP effect might occur only when there is significant masked stimulus awareness.

Online testing was more variable and yielded smaller effects than traditional, in-person testing. In both experiments, some participants struggled due to the demanding nature of performing two time-urgent lexical decisions.

The combination of prime identification plus the PRP effect might provide converging evidence for investigating the influence of stimulus awareness in masked priming paradigms.

References

- Pashler, H. (1994). Dual-task interference in simple tasks: data and theory. *Psychological bulletin*, 116(2), 220.
- Stoet, G. (2010). PsyToolkit - A software package for programming psychological experiments using Linux. *Behavior Research Methods*, 42(4), 1096-1104.
- Stoet, G. (2017). PsyToolkit: A novel web-based method for running online questionnaires and reaction-time experiments. *Teaching of Psychology*, 44(1), 24-31. <https://doi.org/10.1177/0098628316677643>

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