Meaning inhibition of subliminally presented, backward masked words: Towards a new priming technique

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### Background

**Priming:**
- Exposure of a sensory stimulus can facilitate processing of subsequent stimuli
- Obtains with visible and invisible prime words (Draine & Greenwald, 1998)
- Can be automatic

**Inhibition:**
- Exposure of a sensory stimulus can impede processing of subsequent stimuli
- Results from strategic processes or competition between two or more parallel processes one of which is given priority (Tipper, 1985)

**Eimer and Schlaghecken (1998):**
- Inhibition can be automatic and obtains for low-level perceptual stimuli when primes are (a) invisible and (b) immediately replaced by a backward mask

- Can automatic inhibition be elicited with linguistic stimuli?
- Does automatic inhibition tap lexical processing?

### Materials and Procedure

**Materials:** 20 homonyms, N = 97 (4 lists)
- Each ambiguous **prime** was paired with **two target words:** one reflecting its more frequent, dominant reading and one reflecting its less frequent, subordinate interpretation.
- Targets served as their own **baselines**
- Distractors: 80 pseudohomophones, 260 additional fillers
- **Dominance Norming:** Provide a total of five words or phrases that come to mind first when reading the word in question.
  - Dominance score: 87% (dominant meanings) vs. 13% (subordinate meanings)

**Procedure:** continuous priming, lexical decision on each visible prime and target word

**Experiments 1:**
- Visible primes and targets
- No masking

**Experiments 2 & 3:**
- Invisible primes (50ms), visible targets
- Forward and backward masking (&;&;&;&;&; & &)
  - throughout ISI

### Experiment 1: Visible Primes

- **Prediction:** If only more frequent but not less frequent meanings of homonyms are retrieved we should observe **response facilitation** for dominant-meaning but not subordinate-meaning related targets with visible primes (Simpson, 1981).

- Only dominant-meaning related targets are primed when primes are visible

### Experiment 2: Invisible Primes

- **Prediction:** If response inhibition reported for low-level perceptual stimuli extends to linguistic stimuli (homonyms) we should observe slower RTs than baseline to targets when primes are (a) presented for only 50ms and (b) immediately backward masked (&;&;&;&;&; & &).

- **Prediction 1:** If only more frequent but not less frequent meanings related targets with visible primes &
- **Prediction 2:** If processes involved in response inhibition are sensitive to lexical processing, slower RTs to targets should selectively affect either dominant-meaning or subordinate-meaning related targets.

- Significant inhibition observed when primes are invisible and immediately backward masked
- Response inhibition is restricted to dominant-meaning related targets
- These data suggest that response inhibition associated with invisible, masked primes only affects targets that are primed with visible, unmasked primes

### Experiment 3: Invisible Primes

- **Prediction:** If response inhibition (Experiment 2) develops over time (Eimer & Schlaghecken, 2002) we should observe slower RTs than baseline to targets with a 200ms backward mask and no effect or even priming with a 50ms backward mask.

- Only dominant-meaning related targets are inhibited when the backward mask lasts for 200ms

### Conclusions

- We have applied a priming technique to linguistic stimuli that elicits response inhibition where the standard priming technique elicits response facilitation
- Obtained automatic inhibition crucially depends on (a) the subliminal presentation of the prime (50ms) and (b) a sufficiently long backward mask (200ms)
- The new technique taps lexical processing and keeps the possibility of strategy formation at a minimum (Hutchinson, 2003)

### References

