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How "semantic" is response priming restricted to practiced items? A reply to Abrams & Grinspan (2007) ☆

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Abrams and Grinspan (2007) provide some of the best evidence so far for the existence of unconscious perception. Indeed, they show that priming is still reliable even when partial awareness is impossible, that is when subjects cannot be conscious even of fragments of the prime. This demonstration adds to the growing body of work that provides evidence for the genuine existence of subliminal influences (see Kouider & Dehaene, 2007 for a review). This article by Abrams and Grinspan is of particular interest because past research has not adequately considered the problem of partial awareness.

In several papers (Kouider & Dupoux, 2001, 2004, 2005), we have argued that although there exists compelling evidence for subliminal priming that involves perceptual, lexical and motor levels of processing, the existence of semantic priming remains unproven. Moreover, we have shown that some examples of masked semantic priming previously thought to be subliminal could rather be attributed to partial awareness (Kouider & Dupoux, 2004). In a Stroop priming task with masked color words as primes (e.g., GREEN) and colors as targets (rows of blue or green hashes), we used a situation in which priming occurs in the absence of global awareness (e.g., subjects could not discriminate between minimally different primes like GREEN and GENER). Though this phenomenon has previously been cited as proof of the existence of unconscious semantic priming (Cheesman & Merikle, 1986; Merikle & Joordens, 1997), we found in this paradigm that subjects were still partially aware of the primes (i.e., they could discriminate letters from pseudo-letters). Moreover, we also added a priming condition with pseudo-word primes (e.g., GENER) and showed that Stroop priming occurs equally as well as for real color words, demonstrating that priming was driven by fragments or letters. We hence hypothesized that when the stimulus set is small and over-repeated, subjects reconstruct the entire prime on the basis of fragments/letters; perceiving a few letters (G, R) is sufficient to reconstruct the entire word GREEN, and hence induces an apparent subliminal "semantic" priming effect.

Abrams and Grinspan used an affective evaluation task in which subjects classified pleasant (e.g., smile) vs. unpleasant (e.g., tumor) target words preceded by congruent or incongruent prime words (i.e., from a same or different category). In earlier studies, Abrams and colleagues (Greenwald, Draine, & Abrams, 1996) showed congruity priming under conditions where participants could not perform the evaluation task on the prime, suggesting reliable semantic priming without awareness. However, Abrams and Greenwald (2000) later found that their own past findings could be reinterpreted as requiring no semantic mediation. Indeed, congruity priming occurred only if the prime words had been over-repeated as targets and thus extensively practiced.

☆ Commentary on Abrams, R. L., & Grinspan, J. (2007). Unconscious semantic priming in the absence of partial awareness. *Consciousness and Cognition, 16*(4), 942–953.

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These effects did not generalize to unpracticed words. Moreover, they found that congruity priming resulted from a learned association between fragments of the word primes and the response (see also Damian, 2001). For instance, after the target words 'smut' and 'bile' were repeatedly classified as unpleasant, the prime word 'smile' (composed of **sm**ut and b**ile**) primed the category unpleasant! These results suggest that subliminal words were analyzed here only in terms of their orthographic constituents, not as whole words, and thus not at a semantic level. Therefore, this paradigm is best described as inducing priming of response codes (i.e., response priming) rather than priming at the semantic level.

Because Abrams and Greenwald (2000) used only a global awareness measure (i.e., affective evaluation on the prime), it remains ambiguous as to whether this response priming phenomenon induced by sub-word elements may have resulted from partial awareness. In the article under consideration here, Abrams and Grinspan successfully demonstrate that response priming still occurs even without partial awareness, suggesting that it genuinely reflects unconscious perception. So far, so good.

A problem arises, however, with the way in which Abrams and Grinspan interpret their results. They conclude that their data refute the Kouider and Dupoux claim that semantic priming requires at least partial awareness. To adequately refute this claim, Abrams and Grinspan would need to demonstrate congruity priming in the absence of partial awareness and, crucially, for unpracticed primes. If congruity priming remains restricted to practiced items, as is the case in their study, it constitutes evidence not only in support of response priming, but also against semantic priming.

One is left wondering why Abrams and Grinspan claim to provide evidence for "unconscious semantic priming in the absence of partial awareness" (their title). A possible explanation stems from the fact that Abrams and Grinspan are using the term "semantic" priming in a rather liberal way. They define it as "priming that depended on recognition of the distractor's semantic category" (p. 10). This definition is problematic because it remains to be demonstrated that responses are being driven by the semantic level, rather than through some ad-hoc arbitrary classification learned just for the experiment. If priming is restricted to "an arbitrary classification which is applied only to the 16 intensively trained items in the experiment", it becomes extremely misleading to describe this as "semantic".

Hence, we argue that the authors' description of their results as showing "masked semantic priming by practiced words" (their abstract) is both an exaggeration and a self-contradiction. Applying Ockam's razor, the best interpretation is that the effect they document is not at all semantic, but rather a type of response priming due to experimentally induced associations between letters or word fragments and a motor response (Damian, 2001) or a response category (Abrams, Klinger, & Greenwald, 2002).

In brief, by showing that unconscious priming occurs in the absence of partial awareness but yet is restricted to practiced words, Abrams and Grinspan not only provide some of the best evidence so far in favor of the existence of unconscious perception, but they also provide the best evidence so far *against* the existence of subliminal semantic priming. The initial conjecture of Kouider and Dupoux (2004) remains unscathed by their article. Further research is needed to determine whether true (i.e., generalizable) semantic priming occurs in the absence of partial awareness.

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