



Contents lists available at ScienceDirect

## Consciousness and Cognition

journal homepage: [www.elsevier.com/locate/concog](http://www.elsevier.com/locate/concog)

## Susceptibility to unconscious influences is unaffected by a challenging inhibitory task or mental exhaustion

Angela Gurney\*, Anna-Nepheli L. Lagos, Abigail Manning, Ryan B. Scott

School of Psychology, University of Sussex, Brighton BN1 9RH, UK

### ARTICLE INFO

#### Keywords:

Inhibitory control  
Self-control  
Unconscious  
Subliminal priming

### ABSTRACT

Unconscious influences have been demonstrated in a variety of behavioural contexts, however, a key question remains – to what extent do such influences vary with our changing mental states? We examine whether a prior inhibitory challenge increases susceptibility to subliminal priming in a stem completion task employing neutral (Experiment 1) and reward salient terms (Experiment 2). Results show stem completions to be significantly influenced by unconscious priming, and the challenging inhibitory task (the Stroop) to be significantly more mentally exhausting than the control task. However, neither the degree of inhibitory challenge, trait self-control, nor task-related mental exhaustion significantly influenced unconscious priming. Bayesian analysis provides strong evidence that prior inhibitory challenge does not affect susceptibility to unconscious priming. The study supports the conclusion that unconscious processing can be independent of consciously experienced mental states and provides reassurance that inhibitory impairment, common to mood disorders, should not increase susceptibility to unconscious influences.

### 1. Introduction

Human susceptibility to unconscious influences has been of enduring interest in both lay and research contexts since the earliest psychological endeavours. An extensive literature exists demonstrating the effects of unconscious priming in various forms on a variety of behavioural outcomes (e.g. Kiefer, 2002; Klauer, Eder, Greenwald, & Abrams, 2007). An important question that is largely unexplored in this context however, is the extent to which such influences vary with our changing mental state – are we more susceptible to unconscious influences when tired or exhausted from prior mental exertion? Gauging the extent of such variations could be especially important to understanding how unconscious influences contribute in a variety of clinical conditions characterised by chronic mental fatigue and impaired inhibitory control. Those with low levels of self-control suffer from poorer inhibition of negative emotional responses (Kieras, Tobin, Graziano, & Rothbart, 2005), engage in more health risk behaviours (Wills, Isasi, Mendoza, & AINETTE, 2007) and report higher levels of psychopathological symptoms including those linked to depression, anxiety, obsessive-compulsive disorder, phobias and paranoia (Tangney, Baumeister, & Boone, 2004), see de Ridder, Lensvelt-Mulders, Finkenauer, Stok, and Baumeister (2011) for a meta-analysis. Thus, with control being paramount to a healthy human psyche, it is important to better understand how those suffering from mental fatigue might be differentially affected by unconscious influences.

Hypnotism and evolutionary theory are often credited as being the first allusions to the unconscious, but it was Pierce and Jastrow (1884) who were the first to empirically study subliminal perception and to report the ability to distinguish between different stimuli, even in the absence of conscious awareness. Another early account of subliminal priming comes from Sidis (1898), who presented

\* Corresponding author at: School of Psychology, Pevensey Building, University of Sussex, Falmer BN1 9QH, UK.  
E-mail address: [a.gurney@sussex.ac.uk](mailto:a.gurney@sussex.ac.uk) (A. Gurney).

<http://dx.doi.org/10.1016/j.concog.2017.10.016>

Received 30 May 2017; Received in revised form 29 September 2017; Accepted 29 October 2017

1053-8100/© 2017 Elsevier Inc. All rights reserved.

participants with small cards printed with a single number or letter, at a distance from which they reported being unable to decipher the stimuli. Despite reporting being unable to consciously perceive the stimuli, Sidis discovered that when tested using a forced choice paradigm, the participants guessed the cards' contents correctly at above chance, suggesting some level of unconscious perception. Although it became a popular topic of research (see Adams, 1957, for a review), subliminal priming received much criticism from claims that there was a need for a higher level of certainty about participants' awareness of primes or the implementation of a confidence criterion (Eriksen, 1960).

Cheesman and Merikle (1984, 1986) distinguished between objective and subjective thresholds of conscious awareness. The objective threshold is defined by the level at which performance in some discrimination is objectively at chance. In contrast, the subjective threshold more directly taps the phenomenal experience and is defined by that level at which participants believe they are unable to discriminate the stimuli regardless of whether they actually show above chance accuracy (Jack & Shallice, 2001; Merikle, Smilek, & Eastwood, 2001). The subjective threshold demonstrates a lack of meta knowledge in the sense that participants either truly believe they are guessing or show no correlation between their confidence and accuracy, referred to respectively as the 'guessing criterion' and 'zero correlation criterion', (Dienes, Altmann, Kwan, & Goode, 1995). There has been considerable evidence for priming below the objective threshold, however for the most part effects have been smaller, hard to attain and short lived (e.g. Draine & Greenwald, 1998; Klauer et al., 2007, though cf. Van den Bussche, Van den Noortgate, & Reynvoet, 2009, for a meta-analysis of subliminal priming effects who report no significant effect of using objective versus subjective thresholds). In the present study, where the central purpose is to assess whether different mental states might affect our susceptibility to unconscious influences, it is important that we attempt to adopt the most sensitive of measures; for this reason, we adopt a subjective threshold in identifying participants unconscious thresholds.

One of the enduring paradigms for the study of unconscious influences, is the stem completion task (see Graf & Mandler, 1984). This task involves presenting a word prime for a duration too brief to be consciously discerned and then requiring the participant to complete three letters (a word stem) to form the first word that comes to mind. Typically, the word stem could be completed to form the subliminally presented word as well as multiple alternatives. For example, for the prime 'reliable', the stem would be 'rel' and possible completions would include 'reliable', 'relevant', 'relax', etc. Valid inferences from a stem completion task clearly depend on each stem having an appropriate minimum number of alternate completions (Soler, Dasí, & Ruiz, 2015). Studies have consistently demonstrated that when participants report being unable to read the prime i.e. it is below their subjective threshold, it nonetheless influences their subsequent choice of word completion (Perrig & Eckstein, 2005; Tiggemann, Hargreaves, Polivy, & McFarlane, 2004). The stem completion paradigm has been employed extensively to study implicit learning (Fleischman et al., 2005), lexical memory (Nelson, Keelean, & Negrao, 1989) and memory related individual differences (Lorenzi, Giunta, & Di Stefano, 2006). The present study exploits the stem completion task to index how the degree of subliminal priming differs across task conditions.

When exploring the potential effect of mental states on susceptibility to unconscious influences, a relevant literature is that which has sought to examine the effect of mental exertion on conscious behaviours. This has predominantly been explored in the context of research seeking to manipulate self-control. Such research has employed a dual-task paradigm to evaluate the extent to which exerting inhibitory control on an initial task affects the degree of control applied to subsequent tasks. Prior inhibitory tasks have been reported to influence subsequent behaviour in a variety of different ways, for example resulting in overeating (Hofmann, Rauch, & Gawronski, 2007; Vohs & Heatherton, 2000), increased risk-taking (Fischer, Kastenmüller, & Asal, 2012), aggression (DeWall, Baumeister, Stillman, & Gailliot, 2007), impulse buying (Vohs & Faber, 2007), and more frequent stereotypical judgments (Govorun & Payne, 2006), see Hagger, Wood, Stiff, and Chatzisarantis (2010), for a meta-analysis.

Some accounts of the effects of mental exhaustion on subsequent behaviour have proven to be controversial, with the resource model (Baumeister, Bratslavsky, Muraven, & Tice, 1998) having been especially subject to challenge. This model proposes a reliance on a limited pool of resources which is depletable with use and, once used, takes time to replenish (Baumeister & Vohs, 2007). When in this depleted state subsequent attempts at self-control are thought to be impaired (Baumeister et al., 1998). However, attempts to characterise the resource as blood glucose (Gailliot, Plant, Butz, & Baumeister, 2007; Masicampo & Baumeister, 2008) have been vigorously challenged (Beedie & Lane, 2012; Job, Dweck, & Walton, 2010; Kurzban, 2010; Martijn, Tenbult, Merckelbach, Dreezens, & de Vries, 2002; Schmeichel & Vohs, 2009; Tice, Baumeister, Shmueli, & Muraven, 2007) and without an identifiable resource the model is of limited theoretical value (Kurzban, Duckworth, Kable, & Myers, 2013). A recent meta-analysis (Carter, Kofler, Forster, & McCullough, 2015) and a registered replication report (Hagger et al., 2016) also further challenge this conceptualisation. Nevertheless, new research has demonstrated that as long as inhibitory control tasks, such as those employed in the self-control literature (e.g. the colour naming Stroop), are experienced as being more mentally exhausting, they do appear to impact upon further attempts at self-control (Dang, 2017). The Stroop task was identified by Dang as amongst the strongest and most reliable of the self-control tasks used to induce a state of mental exhaustion and is therefore adopted in the present study as our inhibitory control manipulation.

Despite the enduring belief that trait levels of self-control protect, and are positively correlated with, an individual's ability to overcome the depleting effects of prior exertion of self-control (Gillebaart & de Ridder, 2015; Muraven, Collins, Shiffman, & Paty, 2005), some studies have reported a negative correlation between the two (Imhoff, Schmidt, & Gerstenberg, 2014) or have failed to find any effect at all (Stillman, Tice, Fincham, & Lambert, 2009). Therefore, in order to further explore and control for any relationship between trait levels of self-control, and the use of inhibitory control processes during periods of mental fatigue, we include the Self-Control Scale (Tangney et al., 2004) in the present study. In spite of the challenges encountered by attempts to model self-control, interesting questions remain regarding the effect of mental exhaustion on subsequent unconscious processing.

A large body of research indicates that when adequate cognitive capacity is available, behaviour will be predominantly driven by explicit and controlled processes. However, in situations where this capacity is unavailable, behaviour will be driven by impulses,

Download English Version:

<https://daneshyari.com/en/article/7288120>

Download Persian Version:

<https://daneshyari.com/article/7288120>

[Daneshyari.com](https://daneshyari.com)