



## Suppressing disgust related thoughts and performance on a subsequent behavioural avoidance task: Implications for OCD



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### ABSTRACT

We tested whether suppressing disgust related thoughts, compared with no suppression, differentially affected target thought frequency and emotional responses, and whether this was related to participants' cognitive inhibition abilities. We also tested whether different control instructions during a thought control task would affect performance on a subsequent behavioural avoidance task involving disgust related stimuli. Sixty university students, pre-selected on their level of disgust propensity/sensitivity, were instructed to either suppress or not to suppress all target-related thoughts following viewing of a disgust-related film fragment. Thought suppression immediately reduced target thought frequency, but only for participants with good inhibitory control. Thought suppression led to sustained thought frequency and levels of disgust after suppression was lifted, whereas a significant drop was observed for these measures in the no-suppression group. Thought control instructions did not affect performance on the behavioural avoidance task at the group level. However, regression analyses showed that changes in thought frequency during thought suppression interacted with beliefs concerning importance of thoughts and thought control when predicting fear and disgust reactions during the behavioural task.

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### Introduction

According to cognitive theories of Obsessive Compulsive Disorder (OCD), appraisals of intrusive thoughts as threatening, inappropriate or personally meaningful in some way, lead to neutralisation and other counterproductive coping strategies that can escalate and maintain the disorder (Rachman, 1997, 1998; Salkovskis, 1985; Salkovskis, Forrester, & Richards, 1998). Thought suppression is one such coping strategy that is frequently used by individuals with OCD (Freeston & Ladouceur, 1997; Purdon, Rowa, & Antony, 2007). There is evidence that suppression of a neutral thought can paradoxically make the thought more interfering or increase its frequency during suppression (i.e. immediate enhancement of thoughts; Wegner & Erber, 1992; Wegner, Schneider, Carter, & White, 1987) or after suppression ceases (thought rebound; Wegner et al., 1987). According to the ironic processes theory of mental control (Wegner, 1994), two cognitive

processes are at work during thought suppression: a capacity-limited, attention demanding operating process that searches for distracters to promote suppression; and an automatic monitoring process that is relatively independent of cognitive capacity, keeping track of suppression failures. Immediate enhancement of suppressed thoughts occurs when the operating process is disrupted (e.g. with cognitive load imposed by a concurrent task), but a rebound of thoughts is observed when the monitoring process continues its vigilance when the operating process stops (Wegner, 1994; Wenzlaff & Wegner, 2000).

Even though thought suppression is part of the clinical presentation of OCD, experimental results are not clear regarding its role in the escalation of intrusive thoughts. A meta-analysis of results from 28 studies revealed no overall immediate enhancement from thought suppression but a small but significant rebound effect (Abramowitz, Tolin, & Street, 2001). In studies more relevant to OCD, several studies have found either immediate enhancement or rebound effects from suppression of negative intrusive thoughts in non-clinical samples (McNally & Ricciardi, 1996; Salkovskis & Campbell, 1994; Trinder & Salkovskis, 1994), while others have not (Belloch, Morillo, & Giménez, 2004; Corcoran & Woody, 2009; Grisham & Williams, 2009; Purdon, 2001; Purdon & Clark, 2001).

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Only a few studies have been conducted on OCD patient samples and those have shown little evidence for either paradoxical or immediate enhancement effects of thought suppression (Janeck & Calamari, 1999; Najmi, Riemann, & Wegner, 2009; Purdon, Rowa, & Antony, 2005).

Although currently there is little evidence for the role of suppression in obsessional problems through increased thought frequency above non-suppression, suppression may be a complicating factor that aggravates obsessional problems. Repeated suppression of thoughts puts load on the individual by taxing cognitive resources that can make thought control and self-regulation more difficult (Najmi & Wegner, 2009). The importance of cognitive resources in successful thought suppression may have been underestimated (Wenzlaff & Wegner, 2000). This pertains particularly to immediate enhancement effects that result from reduced efficiency of the capacity limited operating process. Studies show that competition for available cognitive resources by imposing cognitive load with a concurrent cognitive task (e.g. memory task) or cognitive demands (e.g. time pressure), diminishes thought control and the material to be suppressed becomes more accessible and influential (Wegner & Erber, 1992; Wegner, Erber, & Zanakos, 1993; Wenzlaff & Bates, 1998). Only a few studies have assessed cognitive ability in relation to thought suppression, but there is some support for the role of working memory capacity in general, and resistance to proactive interference in particular, in the effectiveness of suppression. Working memory capacity represents the ability to simultaneously store and process material for later retrieval (Conway & Engle, 1994; Rosen & Engle, 1998) that requires relevant material being kept active while irrelevant material is inhibited (Miyake, Friedman, Emerson, Witzki, & Howerter, 2000). Such inhibitory control or cognitive inhibition (i.e. suppression of a previously activated cognitive representation; Harnishfeger & Bjorkland, 1993) is implicated in working memory capacity with studies showing that greater capacity is related to the ability to resist proactive interference (interference from previously but no longer relevant material; Kane & Engle, 2000; Rosen & Engle, 1998; see also Redick, Heitz, & Engle, 2007). Frequency of neutral (Brewin & Beaton, 2002) and negative thoughts (Brewin & Smart, 2005) during thought suppression is negatively correlated with a measure of working memory capacity, indicating that efficient suppression relies on flexible and goal-directed control of attention. Results from a recent study by Bomyea and Amir (2011) suggest that inhibition of irrelevant information may be particularly important in this respect. In this study, participants that underwent working-memory training that required good inhibitory control because of high levels of proactive interference during the training, showed greater improvements in working-memory capacity and fewer intrusions during thought suppression, compared to participants that underwent working-memory training that required low inhibitory control because of lower levels of proactive interference (Bomyea & Amir, 2011). Cognitive ability in the form of control over irrelevant material (e.g. proactive interference) may therefore moderate the effect thought suppression has on thought frequency in a way that better resistance to this interference results in more efficient suppression.

Thought suppression may also complicate conditions by interfering with the processing of thoughts and emotions. Suppression results in smaller reduction in frequency of OCD-relevant thoughts, compared with no suppression (Belloch et al., 2004; Corcoran & Woody, 2009; Grisham & Williams, 2009; Purdon, 2001), indicating that it may interfere with the normal processing of thought material that would be expected to take place after repeated exposure to thoughts (Clark, 2004, p. 127). Similar effects have been observed for negative mood within a thought suppression task

(Najmi et al., 2009; Purdon, 2001). Such suppression may influence the rate of habituation to thoughts or emotions, which could increase subsequent avoidance and compulsive behaviours that have the goal of reducing emotional distress and likelihood of feared outcomes. Any influence of thought suppression on subsequent avoidance and compulsive behaviours has, to date, not been studied. Because thought suppression can enhance attentional biases on cognitive tasks (Lavy & van den Hout, 1994; Tolin, Abramowitz, Przeworski, & Foa, 2002, Experiment 2) and attentional training involving threat material can influence avoidance behaviour on a behavioural approach task (Najmi & Amir, 2010), thought suppression can be expected to influence performance on a subsequent behavioural avoidance task (BAT) by either increasing avoidance and/or strengthening affective and cognitive responses. Thought suppression may also increase avoidance behaviour through perceived failures in thought suppression. Negative appraisals of failed suppression attempts (i.e. thought reoccurrences associated with undesirable personality characteristics and future negative events) can increase negative mood (Purdon, 2001; Purdon et al., 2005). Research results show that beliefs in the importance of thoughts and thought control are among the types of meta-cognitive beliefs that characterize OCD patients (OCCWG, 1997, 2005). Failed suppression attempts should be particularly detrimental for those holding these types of beliefs and can be expected to influence emotional responding and fuel subsequent avoidance and compulsive behaviours.

There is mounting evidence that disgust plays a role in certain types of OCD symptoms, in particular washing and contamination related symptoms (for a comprehensive review see Olatunji, Cisler, McKay, & Phillips, 2010). Although longitudinal studies are lacking on the role of disgust in OCD, the evidence suggests that disgust propensity and/or sensitivity predict washing symptoms independently of anxiety and depression (Olatunji, Sawchuk, Arrindell, & Lohr, 2005). Further, the evidence also suggests that they mediate the relationship between contamination related symptoms and negative affectivity (Olatunji, Lohr, Sawchuk, & Tolin, 2007) and avoidance during a behavioural avoidance task involving disgust eliciting stimuli (Deacon & Olatunji, 2007). The emotion of disgust may therefore play a causal role in contamination related OCD with increased disgust propensity or sensitivity acting as a vulnerability factor for the development and maintenance of OCD symptoms. No studies have been carried out on suppression of disgust invoking stimuli to date but, as noted earlier, suppression of fear/anxiety related thoughts has resulted in sustained or increased levels of negative mood (Najmi et al., 2009; Purdon, 2001). Since suppression terminates exposure to the thought being suppressed, thought suppression should interfere with emotional processing of disgust evoking material, resulting in both increased recurrence of thoughts and levels of disgust, motivating behavioural avoidance in line with previous studies of the avoidance function of disgust in OCD (Deacon & Olatunji, 2007; Olatunji et al., 2010).

#### *The current aims*

The main objectives in the present study were to investigate the effect of thought control instructions (suppression vs. do not suppress) on thought frequency, emotions and performance on a behavioural avoidance test and to see if cognitive ability (resistance to proactive interference) interacted with thought suppression in this relationship. We studied this for participants that differed in their level of vulnerability to disgust related material by selecting participants that were either high or low in disgust propensity and sensitivity and showed them a disgust-inducing

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