J. Behav. Ther. & Exp. Psychiat. 44 (2013) 343–350

Contents lists available at SciVerse ScienceDirect

Journal of Behavior Therapy and Experimental Psychiatry

journal homepage: www.elsevier.com/locate/jbtep

Responding to intrusions in obsessive-compulsive disorder: The roles of neuropsychological functioning and beliefs about thoughts

Jessica R. Grisham [a,*], Alishia D. Williams [b]

[a] School of Psychology, University of New South Wales, Sydney, NSW 2052, Australia
[b] School of Psychiatry, University of New South Wales at St. Vincent's Hospital, Sydney, NSW 2010, Australia

ARTICLE INFO

Article history:
Received 12 September 2012
Received in revised form
30 November 2012
Accepted 23 January 2013

Keywords:
Obsessive-compulsive disorder
Thought suppression
Working memory
Response inhibition

ABSTRACT

Background and objectives: The aim of the current study was to examine cognitive and psychological factors hypothesized to affect responding to intrusions in obsessive-compulsive disorder (OCD).
Methods: A group of individuals diagnosed with OCD ($N = 22$) was compared to a social phobia (SP) group ($N = 25$) and a nonclinical control group ($N = 24$). Participants performed a battery of neuropsychological tasks, completed self-report measures, and engaged in a self-relevant thought suppression task.
Results: Participants in the OCD group demonstrated worse working memory and response inhibition on the neuropsychological tasks and had increased intrusions during the suppression task relative to comparison groups. They also reported more distress during the task relative to the nonclinical group, but not the SP group. Regression analyses revealed that beliefs about thought control failures, but not working memory or response inhibition, was associated with increased frequency of intrusions and greater distress during suppression.
Limitations: Future studies may include a more comprehensive battery of cognitive tests and have a larger sample size.
Conclusions: Findings support cognitive-behavioural models of OCD that emphasize the role of meta-beliefs in explaining the struggle with obsessional thoughts.

1. Introduction

A defining feature of obsessive-compulsive disorder (OCD) is the presence of recurrent, disturbing obsessions that are difficult to inhibit or suppress. Individuals with this disorder employ various strategies to manage these obsessional thoughts. According to cognitive-behavioural models of OCD, these strategies not only fail to control unwanted thoughts (Purdon, 2004), they negatively impact on individuals' mood and interfere with their daily functioning (Purdon, Rowa, & Antony, 2007). Although research has demonstrated considerable heterogeneity within OCD (Mataix-Cols, Rosario-Campos, & Leckman, 2005), ineffective and psychologically costly attempts to suppress intrusive thoughts may be an important feature of the disorder that cuts across symptom dimensions.

Recently there has been a focus on integrating neuropsychological findings into cognitive-behavioural models of OCD in order to advance our understanding of the disorder (Kyrios, 2011). With respect to ineffective management of intrusions, it has been proposed that individuals with OCD may experience more failures suppressing intrusive thoughts due to certain neurological characteristics (Tolin, Abramowitz, Przeworski, & Foa, 2002). Brain abnormalities have been observed in OCD patients in the orbitofrontal cortex, parietal cortex, and striatum (Menzies et al., 2008). There is also mixed cross-sectional evidence of impaired executive functioning among adults and children with OCD (for reviews, see Greisberg & McKay, 2003; Simpson et al., 2006), as well as preliminary evidence of specific premorbid deficits in executive function (Grisham, Anderson, Poulton, Moffitt, & Andrews, 2009).

Chamberlain and colleagues (Chamberlain, Blackwell, Fineberg, Robbins, & Sahakian, 2005; Chamberlain, Fineberg, Blackwell, Robbins, & Sahakian, 2006) have proposed that response inhibition deficits in particular may be a useful endophenotype of brain dysfunction for OCD. Inefficient inhibition skills may be associated with an inability to keep out extraneous information from working memory (Bjorklund & Harnishfeger, 1990). Thus poor inhibitory control and compromised working memory may lead to difficulties suppressing unwanted thoughts among OCD patients. Recent neuroimaging evidence provides a possible neural substrate for

* Corresponding author. Tel.: +61 2 93853031.
E-mail address: jessicag@unsw.edu.au (J.R. Grisham).

0005-7916/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.jbtep.2013.01.005

these thought suppression difficulties. OCD patients had difficulty activating the right frontoparietal networks, a key area for visuospatial ability, during tasks that required cognitive control (Koçak, Özpolat, Atbaşoğlu, & Çiçek, 2011).

Few studies, however, have directly examined the proposed link between impaired inhibitory control, the component of executive functioning designed to inhibit irrelevant information, and difficulty managing obsessional thoughts. An investigation in our lab found that OCD symptoms in a nonclinical sample were inversely associated with *perceived* thought control ability and greater spontaneous efforts to suppress an intrusive thought (Grisham & Williams, 2009). This study did not, however, directly assess the role of impaired inhibitory control. Working memory capacity tasks may be well suited to address this question, as they specifically assess control over proactive interference (e.g., intrusive thoughts). Performance on these tasks depends on one's ability to sustain goal-relevant information processing when simultaneously presented with alternative goals or distractions (Engle, 2001).

In a nonclinical student sample, Brewin and Smart (2005) found that better working memory on the Operational Span (OSPAN; Turner & Engle, 1989) was related to fewer intrusions in a suppression condition, suggesting a specific association between impaired working memory and ineffective attempts to inhibit unwanted thoughts. The current study is the first, however, to examine the association between indices of cognitive functioning and thought suppression difficulties in a clinical sample of individuals diagnosed with OCD. Following Brewin and Smart (2005), the current study employed the OSPAN (Turner & Engle, 1989), a working memory task that requires concurrent processing of dual tasks (encoding and recalling words while simultaneously solving math equations). The OSPAN was also selected because performance on this task has been associated with emotion regulation (Schmeichel, Volokhov, & Demaree, 2008), suggesting it may also be relevant to responding to distressing intrusions in OCD.

An important objective of the current study was to identify the specificity of thought suppression difficulties and related cognitive impairment relative to appropriate comparison groups. It has been suggested that the neurocognitive profiles in OCD may be better accounted for by the presence of comorbid disorders (Basso, Bornstein, Carona, & Morton, 2001; Moritz et al., 2001). Thus discrepancies in the OCD neuropsychological literature may be partially due to a general lack of appropriate clinical comparison groups (e.g., anxiety disorder controls; although see Cohen et al., 1996). In addition, it is unclear how proposed cognitive deficits may interact with maladaptive beliefs to maintain the disorder. Consistent with cognitive models of OCD (e.g., Purdon & Clark, 2001; Rachman, 1997), we propose that while neurological deficits associated with OCD may lead to slightly increased intrusions and thought suppression failures, beliefs about the meaning and consequences of these failures lead to increased distress, thereby playing a critical role in the maintenance of the disorder.

According to cognitive theories of OCD, individuals with OCD not only misinterpret their obsessions by making *primary* appraisals about the meaning of intrusions, they also make *secondary* appraisals about their mental control efforts and the consequences of failures in thought control (Clark, 2004). Clark (2004) noted that holding these beliefs leads to greater distress and more intrusions than thought suppression alone, as these beliefs can direct increased attention to intrusions. As a result of these secondary appraisals, an individual may employ ineffective strategies, such as thought suppression (e.g., Purdon & Clark, 2001; Purdon, Rowa, & Antony, 2005). These strategies result in failed thought control, the reoccurrence of unwanted cognitions, and heightened distress.

Thus, in the current study, we attempted to integrate two prominent lines of OCD theory and research by examining how both neuropsychological indices and specific beliefs about controlling intrusions predict responding to intrusions in a clinical OCD sample. We administered tests of several aspects of cognition proposed to influence thought suppression: working memory (OSPAN), response inhibition (Hayling), and set-shifting (Trail Making Test). We also included the Wechsler Abbreviated Scale of Intelligence (WASI), an abbreviated gold standard measure of intellectual functioning to control for overall intelligence. In order to clarify whether any deficits in these domains are specific to OCD or represent a shared feature of anxiety in general, we compared OCD participants to both a healthy nonclinical group and an anxious comparison group (primary social phobia diagnosis). Because one of the primary cognitive tasks required participants to perform the task aloud with an experimenter tracking accuracy, we chose to include an anxiety control group that exhibited high anxiety overall, as well as a fear of negative evaluation, in order to isolate the effects of the OCD diagnosis. Furthermore, we assessed for general psychopathology in order to rule out the potential confounding influence of anxiety and depression on cognitive functioning.

In addition to examining the cognitive strategies individuals use in their daily life, we employed a modified thought suppression paradigm with a naturalistic intrusive thought (Rassin, 2001) to investigate the influence of these neurocognitive functions on *in vivo* control efforts. We induced a self-relevant negative thought (imagining a loved one in a car accident) and instructed all participants to suppress the thought. Previous studies have employed a thought suppression paradigm with individuals with OCD (Janeck & Calamari, 1999; Tolin et al., 2002). A novel aspect of the current study, however, was the focus on identifying specific indices of cognitive dysfunction and OCD-related beliefs that predicted response to the thought suppression task.

In sum, the aim of the current study was to examine neuropsychological and cognitive-behavioural explanations for recurrent obsessional thoughts in OCD. In order to accomplish this aim, we determined whether cognitive impairment, such as decreased response inhibition, set-shifting, and working memory, had an impact on chronic and *in vivo* responding to intrusions among individuals with OCD. We extended previous research on this question by including an anxiety disorder comparison group with equivalent depression and anxiety symptoms to evaluate the specificity of cognitive deficits. In addition, we investigated the contribution of beliefs about controlling unwanted thoughts to thought suppression efforts, failures to suppress intrusions, and distress during suppression. Our predictions were as follows:

1. The OCD group would demonstrate poorer performance on tests of working memory, response inhibition, and set-shifting than both comparison groups, despite comparable intelligence overall.
2. The OCD group would report increased chronic thought suppression and greater beliefs about the need to control thoughts relative to both comparison groups.
3. The OCD group would experience increased frequency of intrusions (thought suppression failures) and increased distress during a self-relevant thought suppression task relative to both comparison groups.
4. Secondary appraisals regarding the need to control thoughts would predict suppression efforts during a no-instruction baseline phase.
5. Worse performance on cognitive tasks and secondary appraisals about the need to control thoughts would predict increased frequency of intrusions and increased distress during thought suppression.