The impact of attentional and emotional demands on memory performance in obsessive-compulsive disorder

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ABSTRACT

Lower performance on memory tests in obsessive-compulsive disorder (OCD) has been repeatedly observed. However, the origins of these performance deficits are not sufficiently explained. In this study we tested if OCD-related extensive focus of attention on thoughts (heightened self-consciousness) could be an explanatory mechanism for lower memory performance. Heightened situational self-consciousness was manipulated by instructing participants to either monitor neutral thoughts or to monitor OCD-related thoughts. We included a Behavioral Avoidance Task based on individual obsessions and compulsions to induce OCD-related thoughts. Participants were asked to perform these monitoring tasks in parallel to a taxing verbal memory task, resulting in learning under divided attention. The two conditions of learning under divided attention were compared to a single-task condition. Twenty-four participants with OCD and 24 healthy controls took part in these three learning conditions. The results indicate that in both groups memory performance deteriorated in the two conditions with divided attention compared to the single task condition. In the OCD-related thought monitoring condition (OTM) self-consciousness and Behavioral Avoidance Task-induced stress and fear were particularly increased and memory performance further deteriorated in the OCD group. This finding highlights an important and underestimated mechanism (personal involvement) which might serve to better understand lower memory performance in OCD.

1. Introduction

People with obsessive-compulsive disorder (OCD) spend a lot of their daily time thinking about what dangerous things might happen and how this might be avoided (Salkovskis, 1999; Salkovskis & Harrison, 1984; Rachman & de Silva, 1978). This self-directed, negative perseverative thinking in OCD results in high costs for cognitive processing (e.g. Kuelz, Hohagen, & Voderholzer, 2004), which reduces capacity for other basic cognitive processes (e.g. memory, learning, attention) (e.g. Chamberlain, Blackwell, Fineberg, Robbins, & Sahakian, 2005). The aim of the present study is to better understand the mechanisms underlying increased self-directed recurrent thinking and its role as a potential causal factor for lower memory performance in OCD.

Besides the obsessive thoughts and impulses mentioned above, OCD is characterized by repetitive behaviors (compulsions) to avoid anxiety or to neutralize the obsessions (American Psychiatric Association, 2013). There is some neuropsychological evidence that these OCD symptoms might be the result of malfunctioning executive processing, more specific impaired executive inhibition (Chamberlain et al., 2005). Impaired executive inhibition, defined as the inability to have control over internal cognitions (e.g. intrusive thoughts) and externally manifested motor activities (e.g. environmental checking), leads to problems in disengaging from recurrent thinking. Recurrent thinking itself requires great amounts of executive resources, which might result in a lack of resources for other cognitive processes like memory performance. There is a large body of evidence for non-verbal lower memory performance in OCD (Boone, Ananth, Philpott, Kaur, & Djendjedjian, 1991; Christensen, Kim, Dysken, & Maxwell Hoover, 1992; Savage et al., 2000), whereas findings concerning lower verbal memory performances are less consistent (Deckersbach, Otto, Savage, Baer, & Jenike, 2000; Kuelz et al., 2004; Muller & Roberts, 2005; Segalàs et al., 2008; Savage et al., 2000). One line of research suggests that lower memory performance in OCD is due to the impaired

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implementation of appropriate organizational and mnemonic strategies (Kuelz et al., 2004; Deckersbach et al., 2000).

From a different (though not incompatible) perspective, a metacognitive approach postulates that appraisals and control of the thinking process might be one important developmental and maintenance factor of OCD (Fisher, 2009; Wells, 2000). In this account, the content of thoughts is not as relevant for the development and persistence of mental disorders as the classification of thoughts as important or dangerous: the “thinking about thinking”. According to the metacognitive model, mental disorders are associated with the activation of a problematic perseverative program, called “cognitive attentional syndrome” (CAS) (Wells, 2000). This program consists of worrying, rumination, focusing attention on threatening objects and dysfunctional regulation strategies such as suppression and avoidance. The persistence of the CAS is followed by continuous intrusive thoughts and feelings of personal threat as well as increased self-directed attention to control for “thoughts which should not be there” (e.g. intrusions). This threat-monitoring control function was named cognitive self-consciousness (Wells, 2000). In general, self-consciousness is defined as the “enduring tendency of persons to direct attention towards themselves” (Fenigstein, Scheier, & Buss, 1975). According to Fenigstein (1979) it can be differentiated in public self-consciousness (“awareness that others are aware of the self”), and private self-consciousness (“awareness of one’s personal thoughts and feelings”). Private self-consciousness can be further divided in a cognitive, affective and physiological component. In recent studies to OCD, the cognitive component – awareness and control of own thoughts and cognitive processes – was most investigated (e.g. Goldman et al., 2008; Janeck, Calamari, Riemann, & Heffelfinger, 2003; Kikul, Van Allen, & Exner, 2012; Wells & Papageorgiou, 1998). Accordingly, people with OCD seem to monitor their thoughts even more intensive than people with anxiety disorders, major depression episodes or healthy controls (Barahmand, 2003; Kuelz et al., 2004; Deckersbach et al., 2000). The Behavioral Avoidance Task is a standardized, stepwise procedure to measure behavioral avoidance and was implemented to increase the frequencies of OCD-related thoughts in the present experiment. While learning, participants were instructed to monitor the Behavioral Avoidance Task induced OCD-related intrusions. To address the question, whether the suggested lower memory performance in OCD is primary caused by fear through OCD intrusions or merely caused by a reduction of cognitive resources a Neutral-Thought-Monitoring condition was included. In this condition participants were instructed to monitor word intrusions while learning the new word pairs.

Based on the metacognitive model of emotional disorders (Wells, 2000; Wells & Matthews, 1996) we predicted that both dual-task conditions would deteriorate memory performance in both OCD and healthy participants by drawing on limited cognitive resources. We further expected that performance would suffer even more, when personally relevant and emotionally engaging thought contents would be elicited by individual symptom provocation. In subjects with OCD this condition was expected to activate what Wells calls the Cognitive Attentional Syndrome and thus to hamper the switch of attentional focus from internal targets toward the external memory task. Hypothesis 1a thus predicts that the monitoring of neutral and OCD-relevant thoughts during the learning task will lead to a greater increase in situational self-consciousness in comparison to the control condition. Hypothesis 1b predicts that state anxiety will be increased in the OCD-relevant Thought-Monitoring condition compared to Neutral-Thought-Monitoring condition and standard control condition and this effect will be amplified in the OCD group. Hypothesis 2 predicts that memory performance is deteriorated in the two conditions of divided attention compared to the standard control condition. Hypothesis 3a predicts that the OCD-relevant thought monitoring condition increases self-consciousness more strongly in the OCD group compared to the healthy control group. Hypothesis 3b predicts that the OCD-relevant thought monitoring impairs memory performance more strongly in the OCD group compared to the healthy control group.

To overcome this limitation for the present investigation, the experimental design was modified by inducing OCD-relevant thoughts in one condition (OCD-relevant Thought-Monitoring condition, OTM) through a Behavioral Avoidance Task (Steketee, Chambless, Tran, Worden, & Gillis, 1996). The Behavioral Avoidance Task is a standardized, stepwise procedure to measure behavioral avoidance and was implemented to increase the frequencies of OCD-related thoughts in the present experiment. While learning, participants were instructed to monitor the Behavioral Avoidance Task induced OCD-related intrusions. To address the question, whether the suggested lower memory performance in OCD is primary caused by fear through OCD intrusions or merely caused by a reduction of cognitive resources a Neutral-Thought-Monitoring condition was included. In this condition participants were instructed to monitor word intrusions while learning the new word pairs.
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