Obsessive-Compulsive Behaviors and Memory Problems

Karena M. Facchin, Psychology
David Carroll, Ph.D., Professor,
Department of Human Behavior and Diversity

ABSTRACT

There has been much theorizing regarding possible memory impairment contributing to Obsessive-Compulsive Disorder (OCD), specifically relating to checking rituals. Studies examining the possibility that those with OCD may engage in checking rituals due to an inability to discriminate between actual vs. perceived stimuli, have obtained mixed results. The present study compared scores obtained from participants on the Padua Inventory (PI) with their scores on a recognition test consisting of some of the words drawn from those presented to them during the study. Contrary to the hypothesis, participants’ scores on the PI did not correlate with errors on the recognition test. The results indicate the need for a more appropriate technique for examining the possible link between OCD and memory deficits.

Introduction

Obsessive-Compulsive Disorder (OCD) is an anxiety disorder characterized by obsessions (intense and persistent worries) and checking or cleaning rituals (the feeling that one needs to repeat tasks a number of times). Research into OCD is important considering the extensive epidemiology of the disorder in the U.S. This statistic is 2.5% according to the Epidemiological Catchment Area (ECA) survey (“Obsessive-Compulsive Disorder,” 1998).

The proposed relationship between checking rituals associated with OCD and problems with memory have been recognized for some years (Sher, Frost, & Otto, 1983). Comments from patients with OCD that suggest rituals are performed because they have difficulty discriminating between memory for performed actions and imagined actions are common (Brown, Kosslyn, Breiter, Baer, & Jenike, 1993).

In an attempt to examine the reasons for the suggested difficulty in discriminating between memory for actual actions and that of imagined actions, Brown et al. (1993) designed a study that employed a signal detection task, which allowed them to examine inherent discriminatory ability and other factors that contribute to decision making (e.g.,
motivational or attitudinal influences). Brown et al. also used a clinical population that was undergoing treatment (medication and or behavior therapy) at the time of the study, and had a control group and an OCD group. Using word tasks that asked subjects to discriminate between seen and imaged words Brown et al. found that the OCD group discriminated between seen and imaged words significantly better than did the control group.

Because of the possible confounding variables introduced by using participants who are undergoing treatment at the time of the study, other researchers have attempted to avoid these problems by obtaining nonclinical participants from a college population and dividing the participants into an OCD group and a control group by using a self-report measure, such as the Maudsley Obsessive-Compulsive Inventory or the Padua Inventory (Ladouceur, Rheaume, Freeston, Aublet, Jean, Lachance, Langlois, & Pokomandy, 1995).

Sher, Frost, and Otto (1983) used nonclinical participants who were divided into checking or nonchecking groups based on their scores on a checking questionnaire, to study the ability to distinguish between memories of real and imagined actions or events. They used a reality monitoring task consisting of the presentation of a series of word pairs, in which half of the second words in the pair were printed completely and the other half which in the second word only the first letter was printed so that participants had to generate this word. This was used to test the real vs. imagined part of the hypothesis. Sher et al. did not find that checkers differed from noncheckers in their ability to correctly distinguish which words were fully printed and those which they had to generate.

In the current study a self-report measure was used and the scores obtained from participants’ self-report measure were matched with the scores of the memory test. The Padua Inventory, the measure used in the current study, has been tested for its psychometric properties in both clinical and non-clinical samples of college students in Italy (Sanavio, 1988) and the U.S. (Sternberger, & Burns, 1990).

Results with non-patient samples that have produced findings similar to those obtained from clinical samples allows that there is evidence of a continuity between patient and non-patient samples (Burns, Formea, Keortge, & Sternberger, 1995). As such, the use of non-patient samples allows for ease of obtaining participants while still allowing for a better understanding of OCD. Furthermore, it is likely that the finding from the studies using non-clinical samples will have implications for treatment of OCD.

The purpose of the current study was to determine if memory impairment contributes to checking rituals (such as checking the locks on doors) in Obsessive-compulsive behaviors. The proposed memory
impairment is a difficulty in discriminating actual versus perceived events. The memory impairment was tested by means of a recognition test, where two different sets of words were presented. Asking subjects to indicate on the test only those words from the first set served as the measure of ability to discriminate the actual (first set of words) from the perceived (the second set of words). In the current study a nonclinical sample was used to test the hypothesis that scores on the PI would be positively correlated with errors on the recognition test.

**Method**

*Participants*

The participants were 15 undergraduate students drawn from introductory Sociology and Psychology courses at the University of Wisconsin-Superior. Participants were between the ages of 18-40. One participant’s scores were eliminated due to lack of variability in answers on the PI. Participants were offered extra credit in their respective courses for participating in the study.

*Materials*

The recognition test consisted of 10 words from the first set of cards, eight from the second set, 10 that were semantically related to words from either set of cards, and two that were not shown at all during the session. Semantically related words were obtained from a study done by Roediger and McDermott (1995). Roediger and McDermott obtained the lists of semantically related words by first having subjects study lists of words which consisted of associated words of one nonpresented word. Then the nonpresented associates recalled with high confidence were used to compose the later lists. The semantically related words used in the present study were obtained by pairing an associated word with one of the nonpresented words on some of the 15 lists appearing in the Roediger and McDermott study.

The Padua Inventory was also utilized in the current study. The PI is a 60 item self-report inventory that measures the amount and degree of disturbance caused by thoughts and behaviors. The PI is also said to measure the extent to which these behaviors may interfere with daily functioning. Each item is measured on a 5-point scale (zero being 'not at all' and four being 'very much'). The score is the sum total of all 60 items. The PI also has four subscales: 'impaired control of mental activities',
'becoming contaminated', 'checking', and 'urges and worries of losing control of motor behaviors'.

**Procedure**

The participants were presented with 40 index cards, in sets of 20 each, with words printed on them and asked to try to remember as many as possible. There was a minute pause following each set of cards. They were then given a surprise recognition test with instructions to circle only the words that were presented to them on the first set of index cards and to add any words they thought were shown on the first set of cards but were not listed on the test. Following the test, participants were asked to take the PI and record their answers on a blank sheet of paper. Subjects were told that this "questionnaire" inquired about behavior and personality characteristics. The participants were tested in a single session, which lasted an average of 35 minutes, in groups of no more than 11 per session. Participants were asked to remain seated until everyone had finished and were then debriefed.

**Results**

The mean number of words correctly identified (having been shown on the first set of index cards) on the recognition test was 3.9, with the total number of possible correct out of 10. The mean number of words added that participants thought were presented in the first set of index cards on the test by the participants was 3.9, with a possible total number of 10 that could be added. The mean number of list two errors was 1.5 (of 10). The mean for the semantic errors was .43 (of two). Mean scores for the PI were 35.9, with the highest possible score being 350.

A Pearson product-moment correlation performed to determine whether a relationship was present between scores on the PI and the number of list two errors (see Table 1) was not significant, with $r(12) = .15$. The correlation between the PI and semantic errors was not significant, with $r(12) = -.15$.

**Discussion**

The results of this experiment do not support the hypothesis that obsessive-compulsive behaviors may be due to difficulty in discriminating between memory for performed actions and memory for imagined actions. Although the findings in this experiment are contrary to what was hypothesized, they are consistent with some earlier studies (e.g., Brown et al., 1993; McNally & Kohlbec, 1993).
The most notable limitation of this study was the small number of participants from which to obtain data. The sample size being small to begin with, there were not enough participants who were high scorers on the PI. If a larger sample size could have been obtained only those scores in the top 3% on the PI (as suggested by Burns et al., 1995) would be used for the correlation with the scores on the memory test. The theorizing behind this is that it is likely that those who score high on the self-report measure if interviewed would meet the DSM IV criteria for OCD (Burns et al., 1995).

Suggestions for further researchers include emphasis on obtaining a large nonclinical sample, so that participants can be divided into groups (OCD and control) based on scores from the PI with the OCD group being those scoring in the top 3% of the sample.

Furthermore, a study using Positron Emission Tomography (PET) scans to follow the information-processing cycle during a memory task in order to examine where this cycle is impaired, would be recommended. In an earlier study by Savage (as cited in Savage, Baer, Keuthen, Brown, Scott, Rauch, & Jenike, 1999), impairment was found in the areas involved in the encoding and retrieval of information in the frontal-striatal system, which has also been implicated in the etiology of OCD. This would be helpful in designing a more appropriate, cost-effective memory task, which could then be implemented to study larger sample sizes.
Appendix A

Recognition Test

Please indicate which of the following words were presented to you only on the first set of index cards presented. If you remember a word having been presented on the first set of index cards that is not listed on this page, then add it to this list. Please note that the words listed on this page are in a random order.

<table>
<thead>
<tr>
<th>same</th>
<th>physician</th>
<th>phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>format</td>
<td>view</td>
<td>work</td>
</tr>
<tr>
<td>shoe</td>
<td>project</td>
<td>hope</td>
</tr>
<tr>
<td>flower</td>
<td>freeze</td>
<td>peak</td>
</tr>
<tr>
<td>plush</td>
<td>imagine</td>
<td>wrong</td>
</tr>
<tr>
<td>line</td>
<td>hesitant</td>
<td>ship</td>
</tr>
<tr>
<td>tired</td>
<td>front</td>
<td>wish</td>
</tr>
<tr>
<td>disk</td>
<td>honey</td>
<td>time</td>
</tr>
<tr>
<td>size</td>
<td>page</td>
<td>burglar</td>
</tr>
<tr>
<td>stream</td>
<td>white</td>
<td>pencil</td>
</tr>
</tbody>
</table>
Table 1

Correlations between PI and recognition test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Padua</th>
<th>Correct</th>
<th>List two errors</th>
<th>Semantic errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Padua</td>
<td>--</td>
<td>.12</td>
<td>.15</td>
<td>-.15</td>
</tr>
<tr>
<td>Correct</td>
<td>--</td>
<td>-.27</td>
<td>-.50</td>
<td></td>
</tr>
<tr>
<td>List 2 errors</td>
<td>--</td>
<td></td>
<td>-.18</td>
<td></td>
</tr>
<tr>
<td>Semantic errors</td>
<td></td>
<td></td>
<td></td>
<td>--</td>
</tr>
</tbody>
</table>
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Works Cited


