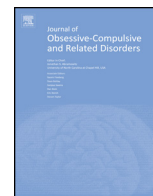




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Uncertainty, checking, and intolerance of uncertainty in subclinical obsessive compulsive disorder: An extended replication



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ABSTRACT

Recently, Toffolo, van den Hout, Hooge, Engelhard, and Cath (2013, 1, 103–109) showed that individuals with subclinical OCD (OC+) respond with more checking behavior to mildly uncertain situations than individuals with low OC tendencies (OC–). The present study aimed to replicate and extend these findings by measuring Intolerance of Uncertainty (IU), and including the whole range of OC tendencies in a correlation analysis. Participants filled out the Obsessive Compulsive Inventory Revised and Intolerance of Uncertainty Scale and performed a visual search task. This task contained 50 search displays, in which participants indicated whether a target was “present” or “absent”. Target-present trials were straightforward, but target-absent trials were ambiguous, because participants had to rely on not having overlooked the target. Results revealed that target-absent trials induced more uncertainty than target-present trials. Furthermore, OC+ participants checked longer than OC– participants in target-absent but not target-present trials. This could not be explained by higher IU in OC+ participants. There were no differences in number of fixations in absent and present trials between the groups. Finally, when looking at the whole range of OC tendencies, there was a positive relation between OC tendencies and checking behavior. The findings (partly) replicated those of Toffolo et al. (2013) and add to their robustness.

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1. Introduction

Uncertainty plays an important role in obsessive-compulsive disorder (OCD). Obsessive thoughts typically relate to uncertainty about frightening prospects (e.g. hurting a loved one), and compulsive acts are efforts to reduce this uncertainty (American Psychiatric Association, 2013). This clinical uncertainty is extreme: it is intense, intrusive and relates to issues that others are certain about (e.g. “can I trust myself that I will not stab my wife while doing the dishes?”). It also seems domain-specific; some patients are extremely uncertain about their competency and safety in driving, but not about visual perception, or the other way around. This extremity and domain-specificity of clinical uncertainty is obvious from the clinical picture (Rachman, 1997). However, more recently, it has become clear that patients with OCD also experience a milder, subclinical form of uncertainty, which needs more subtle testing to be revealed. This type seems more general and occurs in a wide range of domains and

ambiguous situations, which is displayed, for instance, by less confidence in one's memory (Tuna, Tekcan, & Topcuoglu, 2005), perception (Hermans et al., 2008), concentration abilities (Nedeljkovic & Kyrios, 2007), and general knowledge (Dar, Rish, Hermesh, Taub, & Fux, 2000). Researchers argued that this elevated level of subclinical, general uncertainty may precede clinical OCD by acting as a vulnerability factor for the disorder (Nedeljkovic & Kyrios, 2007; Toffolo et al., 2013). Subclinical uncertainty may tempt individuals to seek reassurance by repeated checking in response to normal doubts. Subsequently, when people indeed respond with repeated checking, this may paradoxically increase uncertainty as shown by a great number of studies (e.g. Boschen & Vuksanovic, 2007; Dek, van den Hout, Giele, & Engelhard, 2010; Radomsky, Gilchrist, & Dussault, 2006; van den Hout, & Kindt, 2003, 2004). Therefore, in a previous study, Toffolo et al. (2013) hypothesized that in response to mildly uncertain situations, patients with OCD will use more checking behavior, because even mild uncertainty may bring the yet elevated level of general uncertainty to a point where repeated checking is needed to obtain certainty. The authors developed an experimental eye-tracking paradigm to test whether mild uncertainty indeed induces actual checking behavior in people with subclinical OCD, as opposed to more certain situations.

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Participants were presented 50 visual search displays, and asked to indicate whether a target (closed square) was “present” or “absent” within multiple open squares. In 50% of the trials such a target was present. The target-present trials were self-evident; the response “present” could be based on the perception of the target. Therefore, these counted as “certain situations”. However, target-absent trials were more ambiguous, because participants had to rely on not having overlooked the target. These trials were thus held to resemble “uncertain situations” and to induce feelings of uncertainty. Checking behavior was measured by the time participants searched through the display and by the number of fixations they made while searching. Results revealed that there were no differences in checking behavior in the target-present trials between individuals with high (OC+) or low (OC-) OC tendencies. However, in the target-absent trials, OC+ participants searched longer and used more fixations than OC- participants. Thus, in line with the hypothesis, they found that even in mildly uncertain situations, individuals with subclinical OCD used more checking behavior.

Although intriguing, the findings and interpretations raised some critical questions. First, the authors failed to include a manipulation check. Therefore, it remains unclear whether the target-absent trials led to more uncertainty than the target-present trials, and whether the groups differed in experienced uncertainty. Second, it is unclear *why* the alleged uncertainty promoted checking behavior in the OC+ group. A plausible contributing factor is Intolerance of Uncertainty (IU). IU is defined as the predisposition to react negatively to uncertainty, independent of its probability of occurrence and possible consequences (Ladouceur, Gosselin, & Dugas, 2000). Especially OC checkers show high IU, indicating they find uncertainty more distressing compared to OC non-checkers and healthy controls (Tolin, Abramowitz, Brigidi, & Foa, 2003), and also desire a higher level of certainty than healthy controls (Abramowitz, Khandker, Nelson, Deacon, & Rygwall, 2006). Therefore, it is possible that the OC+ group used more checking behavior in the target-absent trials, because they tolerated the experienced uncertainty less. To investigate this, we conducted an extended replication of Toffolo et al. (2013) that included manipulation checks and the Intolerance of Uncertainty scale (IUS). Finally, to investigate differences in checking behavior in both certain and uncertain situations, Toffolo et al. (2013) used two extreme groups: people who scored extremely high on OC tendencies (OC+) and people who scored extremely low on OC tendencies (OC-). The OC+ group closely resembled the OC tendencies of actual patients with OCD, with a mean score that was only slightly below the mean score of patients. However, it is unclear whether the OC- group is a good resemblance of the normal population. Possibly, the results were not caused by an increased use of checking behavior of the OC+ group, but by the decreased use of checking behavior of the OC- group. Therefore, in the present study we not only analyzed the results for extreme groups, but also for the entire range of OC scores (from very low to very high). Hence, we could investigate whether there was indeed a positive correlation between OC tendencies and checking responses in both certain and uncertain situations.

In sum, the first aim of the present study was to critically replicate the previous findings of Toffolo et al. (2013). It was thus hypothesized that the OC+ group, compared with the OC- group, would show enhanced checking behavior, as indexed by a higher search time and number of fixations, in target-absent trials (*uncertain situation*), but not in target-present trials (*certain situation*). Secondly, we expected that the target-absent trials would provoke more uncertainty than target-present trials. Furthermore, since the OC+ group may have higher general uncertainty to begin with (e.g. Nedeljkovic & Kyrios, 2007) we expect them to experience more uncertainty than the OC- group in the target-absent trials. In addition, OC+ participants might find the same uncertainty more distressing (Tolin et al., 2003), which could explain the different checking responses in target-absent and

target-present trials. This led to the third hypothesis; OC+ participants will respond with more checking behavior than OC- participants in target-absent, but not target-present trials, but this will no longer be the case after controlling for IU. Finally, we tested whether this difference in checking behavior between absent and present trials is not only present when focusing on extreme groups, but also occurs over the entire range of OC tendencies. We expected a positive correlation between OC tendencies and checking behavior (both search time and fixations) in target-absent but not target-present trials. Hence, we expected the difference in checking behavior between absent and present trials to be positively correlated with OC tendencies.

2. Methods

2.1. Participants

Six hundred and sixty students from Utrecht University and the University of Applied Sciences Utrecht were screened with the Obsessive-Compulsive Inventory Revised (OCI-R; Foa et al., 2002). All individuals who filled out their contact information were contacted by phone or e-mail to invite them to participate in this study.¹ To obtain a sample that reflected the whole range of OCI-R scores for the correlation study, we divided the scores in five categories to ensure an equal distribution of scores. Twenty-two participants were recruited with an OCI-R score between 0 and 5, 23 participants had a score between 6 and 10, 22 participants had a score between 11 and 15, 22 participants had a score between 16 and 20 and 20 participants had a score of 21 and higher. OCI-R scores of this sample ranged from 1 to 42 ($M=13.59$, $SD=8.87$).

The replication study of Toffolo et al. (2013) required testing only the two extreme groups (OC-, OCI-R scores 0–5; OC+, OCI-R scores ≥ 20). To ensure sufficient power, we recruited extra OC+ and OC- participants for this analysis (from the original 660 screened students). A total of 56 participants were included in the OC- group (Mean age=21.13, $SD=2.46$, 48 females), and 55 participants in the OC+ group (Mean age=20.51, $SD=2.19$, 45 females). Scores in the OC- group ranged from 1 to 5 ($M=3.54$, $SD=1.26$). Scores in the OC+ group ranged from 20 to 42 ($M=27.07$, $SD=6.15$). This closely resembled the mean score of patients with OCD, namely 28.01 ($SD=13.53$; Foa et al., 2002). All participants signed informed consent and received remuneration or course credit for their participation.

2.2. Material

2.2.1. Obsessive-Compulsive Inventory-Revised (OCI-R)

Obsessive-compulsive tendencies were measured with the Dutch translation (Cordova-Middelbrink, Dek, & Engelbarts, 2007) of the OCI-R (Foa et al., 2002). The OCI-R contains 18 items concerning OCD characteristics, each measured on a 4-point Likert scale (e.g. “I check things more often than needed”, 0=not at all, 4=extremely). The OCI-R has good validity, test-retest reliability and internal consistency in clinical (Foa et al., 2002) and non-clinical populations (Hajack, Huppert, Simons, & Foa, 2004).

2.2.2. Intolerance of Uncertainty Scale (IUS)

Intolerance of Uncertainty was measured using the Dutch translation (de Bruin, Rassin, van der Heiden, & Muris, 2006) of the IUS (Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994). It contains 27 items measuring different aspects of intolerance of uncertainty in general and how much one agrees with these. For instance the idea

¹ Individuals who filled out the OCI-R but were not included in this study were either unable to be reached or did not want to participate.

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