Responsibility causes reassurance seeking, too: An experimental investigation

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ABSTRACT
Excessive reassurance seeking (RS) in obsessive-compulsive disorder (OCD) has been conceptualized as compulsive checking by proxy. Manipulations of responsibility augment a range of OCD symptoms; however, their impact on RS behaviour has not been examined. We hypothesized that under conditions of high responsibility (HR), participants would report greater urges to seek reassurance and more actual reassurance seeking (RS) compared to low responsibility (LR) participants. Participants (N = 72) were randomized to HR or LR conditions, completed a dishwashing task with a confederate, and were given an opportunity to seek reassurance. HR participants reported feeling more responsible for the task, t(64.105) = 5.091, p < .001, d = 1.27., and greater urges to seek reassurance, t(70) = -2.891, p = .005, d = -0.69. HR resulted in more RS than LR, according to confederates, F(1, 70) = 11.603, p = .001, ηp² = .142, and coders, F(1, 70) = 7.725, p = .007, ηp² = .099. LR and HR participants' overt RS was similar, F(1, 70) = 3.752, p = .186, ηp² = .025, but HR resulted in more covert RS than LR, F(1, 70) = 19.328, p < .001, ηp² = .216. HR participants had longer conversations than LR participants, t(57.414) = -4.259, p < .001, d = -1.124. A significant interaction between whether or not participants sought reassurance and time, such that those who sought reassurance reported a decrease in responsibility whereas those who did not reported an increase, suggests that RS transfers responsibility, Wilk's λ = .863, F(1, 70) = 11.119, p = .001, ηp² = .137. Implications for cognitive models of and treatments for RS in OCD are discussed.

1. Responsibility causes reassurance seeking too: an experimental investigation

Obsessive-compulsive disorder (OCD) is characterized by intrusive, anxiety-provoking thoughts (obsessions), and/or repetitive behaviour (compulsions; American Psychiatric Association, 2013; Rachman & Hodgson, 1980). It is a leading cause of disability globally and is present across populations, cultural groups, and genders (APA, 2013; Radomsky et al., 2014; WHO, 2004). A key component of OCD symptomatology is excessive reassurance seeking (RS).

Excessive RS is the repeated solicitation of safety-related information despite having already received it (Kobori, Salkovskis, Read, Lounes, & Wong, 2012; Parrish & Radomsky, 2010; Rachman, 2002; Salkovskis, 1999). RS can take the form of overt, repetitive direct questions (e.g., "Do you think these dishes are clean enough? Are you sure?"). Covert RS refers to seeking reassurance via the use of subtle statements (e.g., "It’s fine for us to leave our house and go on our trip now without checking for our passports again." or "Surely it is safe for me to give our child a drink from this bottle because you saw me clean it properly"; Neal & Radomsky, 2015; Parrish & Radomsky, 2010; Rachman & Hodgson, 1980). Eventually, RS can become highly ritualized and can come to dominate interpersonal interactions, leading to social difficulties for those who seek reassurance (Kobori & Salkovskis, 2013; Salkovskis, Forrester, Richards, & Morrison, 1998). RS can be immensely distressing for the seeker: s/he may feel increasingly dependent on others for anxiety relief and feel embarrassed by continual attempts to evoke safety-related information from others. It can be highly distressing for those from whom reassurance is sought, too, as they see their loved ones so distraught and as they deal with the irritation of being repeatedly asked for safety-related information in various ways.

A transdiagnostic phenomenon, RS is seen in depression, generalized anxiety disorder, panic disorder, illness anxiety, specific phobia, body dysmorphic disorder, and is a hallmark behaviour in OCD (Halldorsson, 2015; Kobori & Salkovskis, 2013; kobori et al., 2012; Parrish & Radomsky, 2010; Phillips, Menard, Fay, & Weisberg, 2005; Salkovskis, 1991; Wells & King, 2006). In depression, RS is thought to gain information about perceived social threats (e.g., fear of losing a
that their performance on a colour-sorting task would have real-world implications (i.e., be used to create a pill dispensing protocol for a Third World pharmacy) reported significantly greater urges to seek reassurance than those told that the task was for basic research (Parrish & Radomsky, 2006). In another experiment, HR participants reported significantly greater urges to seek reassurance when asked to indicate how they would act in written scenarios which implied increased responsibility (Parrish & Radomsky, 2011).

Neal and Radomsky (2015) developed an ecologically valid contamination-related dishwashing task to elicit RS in the laboratory. After washing dishes with ambiguous pictorial instructions, participants were given an opportunity to seek reassurance from their partner (i.e., familiar other vs. confederate). Actual RS was measured with a checklist developed for the study in which instances of RS about various aspects of the dishwashing task were reported by the participants themselves, by the dishwashing partner, and by trained coders. They found that participant- and partner-reported RS were greater in the familiar (vs. unfamiliar) partner condition, but objective coding revealed no differences. They concluded that familiarity may affect perceived RS but not actual RS behaviour, however, the impact of responsibility was not measured in this study.

Thus, to the best of our knowledge, a study designed to assess whether augmented (vs. diminished) responsibility causes more RS behaviour has not been conducted. The present experiment was designed to test four hypotheses. Hypothesis 1 was that participants in conditions of high responsibility (HR) would report greater urges to seek reassurance than those in the low responsibility condition (LR). Hypothesis 2 was that, overall, there would be more total instances of RS behaviour in the HR than LR as measured by participants, confederates, and objective coders. For Hypothesis 3, we wished to more closely examine the type of RS (i.e., overt vs. covert) which was measured by trained coders. Specifically, we predicted that coders would observe more overt and covert RS in the HR condition than in the LR condition. Our final Hypothesis (4) was that RS would facilitate a transfer of responsibility, such that participants who actually sought reassurance would report a decrease in perceived responsibility following the RS opportunity. In contrast, we expected that participants who did not seek reassurance would not demonstrate this decrease in perceived responsibility.

2. Method

2.1. Participants

Seventy-two undergraduate participants were recruited via Concordia University Psychology Department’s Participant Pool or in-class recruitment by the experimenter. The mean age of participants was 23.658 (SD = 6.06, range = 19–52) years. Sixty-eight (94.4%) of the participants were female. Most were single, never married (91.7%). Most described their ethnicity as Caucasian/White (51.4%), 6.9% as African-Canadian, 5.6% as Middle Eastern, and 36.1% as various other ethnicities including Indian, Chinese, Filipino, and Korean. English was the most common mother tongue of the sample (47.29%), followed by French (13.91%). The most commonly reported achieved education level was college-level (77.8%), followed by a university bachelor’s degree (11.1%), and high school (8.3%).

Participants were eligible to participate if they were able to read, speak, and understand English. They were unable to sign-up for the study if they participated in a previously conducted experiment in which a similar protocol was used (Neal & Radomsky, 2015).

3. Materials

3.1. Mock contaminant: garbage bin

A garbage bin was used as the source of contamination. It was filled...
Containers were this study from beginning to end in a step-by-step fashion (see Table 1). They indicated how to complete the dishwashing task developed for following the washing procedure. Cups were placed on a regular kitchen dish rack the cleaning solutions. Cups were placed on a regular kitchen dish rack consistently so as to lead participants to believe that they were fellow trained by the experimenter. They were given extensive training, certain as to whether the cups were sufficiently clean. with objects that appeared to be dirty and were described as used facial tissues, dirty paper towels, used plastic wrap, old coffee grounds, soiled latex cleaning gloves, and fruit peels. Participants were given a list of the contents of the garbage bin to enhance the salience of contamination threat. All of the contents of the garbage were clean but were made to appear dirty.

3.2. Equipment for dishwashing task

Coffee mugs were placed next to the laboratory sink. Fill lines were indicated on the sink and a wash basin. Several different plastic containers were filled with mild cleansers (i.e., dish soap, baking soda, and water). A measuring spoon and stir stick were used to measure and mix the cleaning solutions. Cups were placed on a regular kitchen dish rack following the washing procedure.

3.3. Written instructions for dishwashing task

Instructions were provided to the participant on laminated paper. They indicated how to complete the dishwashing task developed for this study from beginning to end in a step-by-step fashion (see Table 1). Participants were asked to take turns with the confederate every two steps of the task, such that they would switch from washing dishes to reading the instructions, or vice versa. The dishwashing task and instructions were designed to standardize participant behaviour and to be unfamiliar to increase the probability that participants may be uncertain as to whether the cups were sufficiently clean.

3.4. Confederates

Three volunteer undergraduate confederates were recruited and trained by the experimenter. They were given extensive training, scripts, and behavioural guidelines to ensure that they would act consistently so as to lead participants to believe that they were fellow unfamiliar undergraduate participants new to the study, maximizing the possibility of RS. To ensure that all participants completed the same dishwashing procedure, confederates were instructed to read the instructions clearly and to covertly correct variations in participant dishwashing behaviour. Confederates were asked to note any occurrence of major deviations from the procedure, but none occurred. These scripts and guidelines were adapted from those of a previous RS study in which participants sought reassurance from a confederate (Neal & Radomsky, 2015). There was a specific script for the experiment, informing confederates to say specific things at certain points in the experiment (i.e., while entering the experiment, while washing the dishes, answering the questionnaires).

Confederates began every RS opportunity by stating, “The cups seem clean to me”. This assurance was given so that any subsequent requests for information about the proper completion of the task, the cleanliness of the cups, or the safety of others could be considered reassurance seeking. When responding to RS from participants, confederates were trained to respond with a true but vague statement which contained factual information but would be inconclusive and did not provide any reassuring information about the task (e.g., I saw you put the cups into the water, but I could not tell if you got all of the dirt off of them by stirring, so I am not totally sure if they are clean.”).

3.5. Responsibility contract

A contract similar to those used by Lopatka and Rachman (1995) and Radomsky et al. (2001) was employed to manipulate responsibility. HR participants signed to indicate that they understood they were completely responsible for the proper completion of the dishwashing task and would be held completely responsible for any harm that may occur from eventual use of the cups if the procedure was not correctly followed. LR participants signed the contract to indicate that they understood that they would be not at all responsible for any harm that may have occurred from the eventual use of the cups if the task was not completed correctly. Whichever section not completed by the participant was completed by the confederate.

4. Measures

4.1. Symptomatology and belief measures

Participants were asked to complete measures of obsessive-compulsive symptomatology (Vancouver Obsessive-Compulsive Inventory; Thordarson et al., 2004), obsessional beliefs (Obsessive Beliefs Questionnaire-44; OCCWG, 2003) as well as depression, anxiety, and stress (Depression Anxiety Stress Scales; Antony, Bieling, Cox, Enns, & Swinson, 1998). Each of these measures has strong psychometric properties and has been extensively used in research.

4.2. Rating of responsibility

Participants were asked to rate the extent to which they felt responsible for the proper completion of the dishwashing task on a scale from 0 to 100, such that 0 represented feeling not at all responsible and 100 represented feeling completely responsible.

4.3. Credibility ratings

Two credibility ratings were obtained for both the degree to which the participants felt the garbage was dirty and the degree to which they believed the responses from the confederate, each on a scale from 0 to 100, such that 0 represented not at all believable and 100 represented completely believable.

4.4. Rating of urges to seek reassurance

Participants were asked to rate their urges to seek reassurance on a scale from 0 to 100, wherein 0 represented no urge whatsoever and 100 represented an extreme urge to seek reassurance.

4.5. Reassurance seeking checklist (RSC)

The RSC is a five-item measure developed by Neal and Radomsky (2015) to assess instances of RS during a conversation with another person or while talking aloud to themselves. The RSC was designed to be completed by the participant and by the person from who they sought reassurance following a conversational opportunity for RS. An objective coder, blind to the study’s hypotheses, also used the RSC to provide an objective measure of participants’ overt and covert RS. The RSC is a measure of RS behaviour which asks respondents to

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### Table 1

Instructions for dishwashing procedure.

<table>
<thead>
<tr>
<th>Step</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fill sink water from <strong>Tap 1</strong> up to <strong>Fill Line 1</strong>.</td>
</tr>
<tr>
<td>2</td>
<td>Add 2 measures of <strong>Green Cleanser</strong> to sink.</td>
</tr>
<tr>
<td>3</td>
<td>Add 2 measures of <strong>Red Cleanser</strong> to sink.</td>
</tr>
<tr>
<td>4</td>
<td>Stir cleanser solution in sink gently with <strong>Stir Spoon</strong> for 10 s</td>
</tr>
<tr>
<td>5</td>
<td>Add 5 measures of <strong>Blue Cleanser</strong> to sink.</td>
</tr>
<tr>
<td>6</td>
<td>Wait 10 s</td>
</tr>
<tr>
<td>7</td>
<td>Add water from <strong>Tap 1</strong> up to <strong>Fill Line 1</strong>.</td>
</tr>
<tr>
<td>8</td>
<td>Immerse one cup in cleanser solution in the sink, and then wait 10 s</td>
</tr>
<tr>
<td>9</td>
<td>Stir cleaner solution in the sink vigorously with <strong>Stir Spoon</strong> for 5 s</td>
</tr>
<tr>
<td>10</td>
<td>Wait 5 s</td>
</tr>
<tr>
<td>11</td>
<td>Remove the cup from sink and immerse into water in <strong>Basin</strong>.</td>
</tr>
<tr>
<td>12</td>
<td>Wait for 10 s</td>
</tr>
<tr>
<td>13</td>
<td>Remove the cup from <strong>Basin</strong> and place on <strong>Drying Rack</strong>.</td>
</tr>
<tr>
<td>14</td>
<td>Repeat steps 8–13 for remaining cups.</td>
</tr>
</tbody>
</table>

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indicate the number of times that the participant asked direct, obvious questions to cue safety-related information (Overt RS) or made subtle statements to obscure their intention to solicit safety-related information, despite having already received it (Covert RS). It was designed to be completed by the participant, confederate, and a hypothesis-blind coder.

The authors of the RSC argued that internal consistency may not be appropriate and may actually be undesirable in this measure, given that participants are allowed to express any concerns about any aspect of the dishwashing task. Given the idiographic nature participants’ concerns, it was argued that a high internal consistency among responses is unlikely.

4.6. Objective-coding

The audio recording of the conversation (see below) was coded by two trained raters who were blind to condition assignment and to the study’s hypotheses. The primary experimenter (ML) provided psychoeducation about RS to the coders. They were given a standardized coding procedure which was adapted from Neal and Radomsky (2015). It included step-by-step instructions on how to code each audio recorded instance of RS. If first instructed coders to identify RS (instances where safety-related information was solicited after having already received it). It then helped coders identify the topic of RS (e.g., cleanliness of the cups). RS was then categorized by type (i.e., overt, obvious questions vs. covert, subtle statements intended to be dis/confirmed by the partner) with the aid of examples. Additionally, it asked coders to identify the amount of time the participant spent seeking reassurance, heard the provision of reassurance, and the total length of the RS opportunity. A supplemental guide was provided to help coders discriminate non-RS from RS, and overt from covert RS. It gave examples of overt RS (i.e., direct questions) and covert RS (i.e., subtle statements), as well as what did not constitute RS. Once the coders were trained to use these tools, they and the primary experimenter listened to five recordings from pilot testing together. The experimenter helped guide coders through the coding procedure and answered any questions. After this, they completed the ratings of RS for the other recordings of the RS opportunity for the reliability analysis.

Inter-rater reliability for the total number of instances of objectively-coded overt and covert RS was assessed by two-way mixed, absolute agreement, average-measures intra-class correlations (ICCs) to indicate the degree to which coders agreed on how many instances of overt and covert RS occurred during the recorded conversation between participants and the confederate (Hallgren, 2012; McGraw & Wong, 1996). The intrarater reliability for coding of overt RS was excellent (ICC = .846). Reliability for covert RS was good (ICC = .666).

5. Procedure

Each participant was tested individually but was always paired with a confederate. Once both the participant and confederate were present, the experimenter falsely stated that the study’s purpose was to collect normative data about the efficacy of a new dishwashing procedure, such that the data could be used to better understand how people with OCD follow specific instructions to complete highly structured tasks. Once informed consent was obtained from the participant, the dishwashing procedure was explained (see Table 1). The experimenter informed the participant that s/he would be videotaped during the dishwashing procedure. Every participant was then randomized to either the LR or HR conditions.

In the HR condition, the participant was told that s/he was “in charge”, which meant that s/he was responsible for the proper completion of the dishwashing task. S/he was told that s/he would take turns with the confederate every two steps “actually washing” or “just reading” the instructions for the procedure. S/he was reminded to take the task seriously and was told that illness had resulted in the past by careless completion of the task. S/he was asked to sign the contract acknowledging the above.

In the LR condition, the participant was given the same instructions about the dishwashing procedure. However, s/he was told that s/he would “just assist” the HR participant and that s/he would not be responsible for any harm that may occur from eventual use of the cups. S/he was asked to sign the contract acknowledging this.

The confederate was given complementary information (e.g., confederates paired with HR participants were given LR information and vice versa). Once the contract was signed, participants were told that the cups would be clean if the instructions were followed exactly as written.

The experimenter put on gloves and submerged the cups into the garbage. He provided the participant with a list of the contents of the garbage bin, and then he placed the ‘contaminated’ cups next to the kitchen sink. The experimenter gave a copy of the dishwashing instructions (see Table 1) to the participant and confederate and then left the room before the dishwashing procedure began.

Following the completion of the dishwashing task, the participant was asked to complete a questionnaire in a separate testing room, preventing her/him from checking the cups. This first questionnaire consisted of ratings of responsibility and urges to seek reassurance. Upon completion of the questionnaire, the experimenter returned and said that there had been a problem with the video recording, preventing confirmation of the proper completion of the task. The participant was then asked to discuss the task with the confederate, specifically to ask any questions or talk with the confederate to resolve any uncertainty s/he may have about the procedure and/or the cleanliness of the cups. If in the HR condition, the participant was told that s/he would make the final decision as to whether the task was completed exactly as the instructions dictated. In the LR condition, the confederate was to make the final decision. To increase the salience of contamination threat and reinforce the importance of this decision, the experimenter led the participant to believe that either s/he, the confederate, or the experimenter would soon be randomly assigned to drink water from one of the cups. In fact, neither the participant, confederate, nor experimenter ever used the cups to drink anything. The confederate began each conversation by stating, “The cups seem clean to me”. The ensuing audio-recorded conversation was later coded (using the objectively-coded version of the RSC) for instances of RS and time spent reassurance seeking as well as talking without seeking reassurance. The researcher returned and asked the participant to complete a battery of questionnaires, which included ratings of responsibility and urges to seek reassurance, the RSC, and the credibility checks. Once the participant completed the questionnaires, s/he was fully debriefed.

6. Results

6.1. Data cleaning

Key variables contained no missing values or univariate outliers. Skewness and kurtosis values for all variables were all within acceptable limits of ± 3 (George & Mallery, 2010; Tabachnick & Fidell, 2007). There were no outliers on objectively-coded overt (n = 1) and covert RS (n = 1), as well as on the confederate-rated (n = 1), and participant-rated RSC (n = 2). All univariate outliers were converted into the next greatest value within ± 3.29 standard deviations, as recommended by Tabachnick & Fidell (2013). When examined, there were no multivariate outliers.

6.2. Symptomatology and belief measures

HR and LR participants did not differ in terms of obsessive-compulsive symptomatology (Vancouver Obsessive-Compulsive Inventory; Thordarson et al., 2004), 6(69) = 1.010, p = .316, obsessive beliefs (Obsessive Beliefs Questionnaire; OCCWG, 2003), 6(65.46) = 1.728, p
6.3. Manipulation check

An independent samples t-test indicated that HR participants perceived themselves as significantly more responsible for the proper completion of the dishwashing task ($M = 85.55$, $SD = 19.07$) than those in the LR condition ($M = 57.16$, $SD = 27.68$), $t(64.105) = 5.091$, $p < .001$, $d = 1.27$.

6.4. Credibility checks

Two credibility checks were conducted: one on the believability of the confederate’s responses and one on the perceived dirtiness of the mock contaminant. All participants rated the confederate’s responses as at least somewhat believable ($M = 76.43$, $SD = 21.64$). However, when the credibility check of the mock contaminant was conducted, the data for one participant was excluded from analyses because s/he rated the dirtiness of the garbage as 0 of out 100, and five more participants were excluded from analyses because they did not respond to this credibility check. Participants perceived the mock contaminant as dirty ($M = 62.23$, $SD = 28.62$). HR and LR participants reported similar ratings of the garbage bin’s dirtiness, $t(70) = −3.173$, $p = .002$, $d = −.69$ (see Fig. 1).

6.5. Urges to seek reassurance

In Hypothesis 1, we predicted that HR would result in greater urges to seek reassurance. An independent samples t-test indicated that HR participants reported a greater urge to seek reassurance ($M = 53.66$, $SD = 31.78$) than LR participants ($M = 33.28$, $SD = 31.78$), $t(70) = −2.891$, $p = .005$, $d = −.69$ (see Fig. 1).

6.6. Reassurance seeking

**Hypothesis 2.** predicted that HR participants would engage in more RS overall, as reported by themselves, confederates, and objective coders. To assess this, a one-way MANOVA was conducted wherein condition was the independent variable and participant-reported, confederate-reported, and objectively-coded RS were the dependent variables.

The multivariate test indicated a significant difference between the HR and LR conditions, Wilk’s $\lambda = .849$, $F(3, 68) = 3.775$, $p = .011$, $\eta_p^2 = .151$ (see Table 2 and Fig. 2). Univariate analyses indicated no differences in participant-reported RS between the HR and LR conditions, $F(1, 70) = .919$, $p = .361$, anxiety, $t(69) = −.113$, $p = .901$, or stress, $t(69) = .202$, $p = .840$ (Depression Anxiety Stress Scales; Antony et al., 1998).

### Table 2

<table>
<thead>
<tr>
<th>Responsibility Condition</th>
<th>Reporter</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR</td>
<td>Participant</td>
<td>5.54</td>
<td>5.00</td>
</tr>
<tr>
<td></td>
<td>Confederate</td>
<td>1.67</td>
<td>2.17</td>
</tr>
<tr>
<td></td>
<td>Objective Coders</td>
<td>2.53</td>
<td>2.19</td>
</tr>
<tr>
<td>HR</td>
<td>Participant</td>
<td>7.15</td>
<td>6.61</td>
</tr>
<tr>
<td></td>
<td>Confederate</td>
<td>3.72</td>
<td>3.26</td>
</tr>
<tr>
<td></td>
<td>Objective Coders</td>
<td>3.96</td>
<td>2.69</td>
</tr>
</tbody>
</table>

6.7. Overt vs. covert reassurance seeking

**Hypothesis 3.** predicted that HR participants would engage in more overt and covert RS, as reported by objective coders. To evaluate this, a one-way MANOVA was conducted with condition as the independent variable and objectively-coded overt and covert RS as the dependent variables.

There was a statistically significant multivariate difference between the HR and LR conditions, Wilk’s $\lambda = .769$, $F(2, 69) = 10.339$, $p < .001$, $\eta_p^2 = .231$. Univariate analyses indicated that HR participants ($M = 1.20$, $SD = 1.60$) did not seek more overt RS than LR participants ($M = .74$, $SD = 1.29$), $F(1, 70) = 3.752$, $p = .186$, $\eta_p^2 = .025$. However, HR participants sought significantly more covert RS ($M = 1.40$, $SD = 1.06$) than LR participants ($M = .45$, $SD = .76$), $F(1, 70) = 19.328$, $p < .001$, $\eta_p^2 = .216$ (see Table 3 and Fig. 3).

### Table 3

<table>
<thead>
<tr>
<th>Responsibility Condition</th>
<th>Type of RS</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR</td>
<td>Overt RS</td>
<td>1.09</td>
<td>1.55</td>
</tr>
<tr>
<td></td>
<td>Covert RS</td>
<td>1.35</td>
<td>1.13</td>
</tr>
<tr>
<td>LR</td>
<td>Overt RS</td>
<td>.73</td>
<td>1.27</td>
</tr>
<tr>
<td></td>
<td>Covert RS</td>
<td>.42</td>
<td>.75</td>
</tr>
<tr>
<td></td>
<td>Conversation Length</td>
<td>101.51</td>
<td>81.40</td>
</tr>
</tbody>
</table>
over time, follow-up paired-samples $t$-tests were conducted on participants’ ratings of responsibility across time split by RS status (i.e., whether or not they sought reassurance). Those who sought reassurance reported a statistically significant decrease in responsibility, $t(45) = 2.212$, $p = .032$, $d = .330$, and those who did not seek reassurance indicated a statistically significant increase in responsibility, $t(25) = -2.176$, $p = .039$, $d = .435$. This is entirely consistent with the hypothesis that RS transfers perceived responsibility.

### 6.9. Transfer of responsibility

The final hypothesis was that RS would foster a transfer of responsibility, such that those seeking reassurance would report a decrease in responsibility and those who did not seek reassurance would not. A mixed between-within ANOVA assessed responsibility ratings between those who did ($n = 46$) and did not ($n = 26$) seek reassurance over time (i.e., pre-RS opportunity, post-RS opportunity). There was a significant interaction between time and whether or not participants sought reassurance, Wilk’s $\lambda = .863$, $F(1, 70) = 11.119$, $p = .001$, $\eta^2_p = .137$ (see Table 3 and Fig. 4).

### 6.8. Other possible indicator of reassurance seeking

We also compared the total length of the RS opportunity between those in HR and LR conditions. Results indicated that responsibility had a large significant effect on conversation length. HR participants had longer conversations than LR participants, $t(57.414) = 4.259$, $p < .001$, $d = -1.124$ (see Table 3 and Fig. 4).

### 6.9. Transfer of responsibility

The body of experimental literature which evaluates the effects of responsibility on compulsive checking is relatively new but has yielded findings consistent with the above-discussed theory suggesting that responsibility beliefs play a key and causal role in the development and maintenance of compulsive checking and urges to seek reassurance. Experimental research on the role of responsibility is particularly rare in the context of RS (Parrish & Radomsky, 2006, 2011). These experiments found that increased responsibility could lead to increased urges to seek reassurance. The present study extends these findings by demonstrating that responsibility also directly changes RS behaviour.

Experimental examinations of responsibility are known to be challenging as such beliefs are difficult to manipulate (Shafran, 1997). Badham (2012) did not report whether her responsibility manipulation (LR vs. HR) was successful and found no between-condition differences in the incidences of maternal reassurance provision and children’s RS. Furthermore, we suspect that many unsuccessful protocols remain unpublished.

### 7. Discussion

We sought to experimentally examine the impact of augmented (vs. diminished) responsibility on RS. Experimental examinations (e.g., of responsibility) in the context of OCD symptomatology are an important area of research (Arntz et al., 2007; Boschen & Vuksanovic, 2007; Ladouceur et al., 1995, 1997; Lopatka & Rachman, 1995; Radomsky et al., 2001; Shafran, 1997). Experimental examinations of responsibility in the onset and maintenance of OCD symptomatology allow for the evaluation of cognitive models of OCD which describe how beliefs of special responsibility to prevent harm can cause compulsive checking and reassurance seeking (Rachman, 2002; Salkovskis, 1985). They uniquely help to establish causality and consistency with cognitive theory.

#### 7.1. New insights

The present experiment resulted in the successful manipulation of perceived responsibility and replicated previous research which examined the relationship between responsibility and urges to seek reassurance (Parrish & Radomsky, 2006, 2011). Participants in the HR condition reported feeling significantly more responsible for the proper completion of the dishwashing task than those in the LR condition. This demonstrates that responsibility can be experimentally manipulated in a more ecologically valid setting. Participant-reported urges to seek reassurance were greater in the HR condition than in the LR condition.

### Table 4

<table>
<thead>
<tr>
<th>Sought Any Reassurance</th>
<th>$n$</th>
<th>$M$</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-RS Opportunity</td>
<td>No</td>
<td>26</td>
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<tr>
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### Figures

- **Fig. 3.** Mean objectively-coded overt and covert reassurance seeking by condition. Dotted lines indicate the multivariate effect; solid lines indicate the univariate effect. *** $p < .001$, ** $p < .01$.
- **Fig. 4.** Mean conversation length.
- **Fig. 5.** Perceived responsibility for the proper completion of the task prior to and following the RS opportunity. Significant time by RS interaction effect, $p = .001$. 

### Additional Notes

- Fig. 3: Mean objectively-coded overt and covert reassurance seeking by condition.
- Table 4: Mean responsibility for the proper completion of the task ($N = 72$).
- Fig. 4: Mean conversation length.
This finding replicates previous research in which experimental manipulations of responsibility resulted in corresponding changes to urges to seek reassurance.

Importantly, we also found significant differences in actual RS behaviour. To the best of our knowledge, this is the first study to observe significant differences in RS behaviour as the result of a manipulation of responsibility. According to confederates and the objective coders, HR participants engaged in significantly more RS than LR participants. Although not statistically significant, HR participants reported more RS than LR participants. The discrepancy between participant-reported RS and confederate- or coder-reported RS is interesting and has been observed in other RS research (Neal & Radomsky, 2015). When coder-reported RS was more closely assessed, it was found that HR participants sought significantly more covert, but not overt, RS.

In addition, we found that HR participants had significantly longer conversations (including pauses, hesitations, and task-irrelevant small talk) with confederates during the RS opportunity than did LR participants. This suggests that HR participants utilized more than just direct questions (i.e., overt RS) or subtle statements (i.e., covert RS) to solicit safety-related information. As such, RS may encompass nonverbal acts (e.g., facial expressions, hand gestures) and paralinguistic cues (e.g., tone, prosody) which are used to solicit safety-related information without being as noticeable. Nonverbal RS may represent an unstudied maintaining factor worthy of further phenomenological and experimental investigation.

There was a significant interaction between reassurance seeking and changes in perceived responsibility. Participants who sought reassurance reported a significant decrease in responsibility while those who did not seek reassurance reported an increase in their responsibility. This likely transfer of responsibility from seeker to reassurer due to RS has been posited but had not been empirically demonstrated (Kobori et al., 2012; Parrish & Radomsky, 2010). To the best of our knowledge, this is the first experiment to empirically examine this prediction of the cognitive model of responsibility in the context of RS. Temporary reductions in anxiety have been thought to reinforce compulsive checking and RS (Parrish & Radomsky, 2010; Rachman, 2002; Salkovskis, 1985, 1999). It may be that (temporary) reductions in distressing perceptions of responsibility also reinforce RS and that failing to seek reassurance when given the opportunity to do so leads to and strengthens perceptions of responsibility.

A closer look at the RS analysis for Hypothesis 2 indicates that, consistent with Neal and Radomsky (2015), perceptions of RS may differ depending on who is asked. Participants may have perceived more RS overall than either the confederate or coder. While HR participants did report more RS than LR participants, this did not reach statistical significance. This should be investigated in future research.

It could be that HR participants were motivated by interpersonal concerns (Kobori et al., 2012; Parrish & Radomsky, 2010). People who compulsively seek reassurance report strong desires to avoid RS because they know it is countertherapeutic and is very distressing and embarrassing. At the same time, they also are very distressed without reassurance, and thus go to great lengths to carefully ask for it (Kobori et al., 2012; Parrish & Radomsky, 2010). In the present study, both HR and LR participants may have been distracted from accurately encoding instances of RS by desires to prevent embarrassment and carefully ask for reassurance, which may have affected their recall for the frequency of their RS. In a previous experiment (Neal & Radomsky, 2015), when familiarity of the source of reassurance was manipulated, participants and confederates reported that participants sought significantly more reassurance with a familiar other than with an unfamiliar other (i.e., a trained confederate partner), but objective coding revealed no difference. It could be that, because both HR and LR participants were paired with an unfamiliar partner in the present study, they may have been equally embarrassed to seek reassurance and thus self-reported similar amounts of RS when asked. The contrast between the present experiment’s findings and these results may indicate that familiarity affects RS differently than responsibility. It may be that responsibility affects RS behaviour more than perceptions of RS, whereas familiarity may affect perceptions of RS more than it does RS behaviour.

A related explanation may be that participants were attempting to carefully ask for reassurance. Objectively-coded covert RS was greater in the HR condition than the LR condition. However, there was no between-condition differences in objectively-coded overt RS. This indicates that participants preferred to utilize subtle statements instead of direct questions to solicit reassurance. It is possible that participants felt compelled to seek safety-related information yet avoid negative social consequences (e.g., embarrassment, being perceived as bothersome, damage to their working relationship with the confederate) with an unfamiliar person. This is consistent with qualitative descriptions of RS in people with OCD (Kobori et al., 2012; Parrish & Radomsky, 2010). In one such study, themes associated with excessive RS included the reluctance to seek reassurance for its potential negative impact on the relationship they had with other people and the careful asking for reassurance to avoid detection, embarrassment, guilt, shame, and/or offending the source of reassurance (Kobori et al., 2012). Indeed, when asked why they did not seek more reassurance during post-experiment debriefing questions, some participants in the present study indicated that they felt they had to carefully solicit safety-related information from the other person in such a way that minimized the detection of RS and potential negative social repercussions (e.g., embarrassment to self, offending confederate, etc.). A small selection of participant-reported reasons for withholding from seeking more reassurance are as follows: “Only discussed what I thought was necessary and relevant”, “I did not want to seem too anxious”, “She was a stranger, I didn’t want her to feel like I didn’t trust her ability to handle a task”, “I did not want the other person to feel uncomfortable”, and “I didn’t want it to look like I was accusing her of not doing it properly”. This preference for covert RS in the presence of unfamiliar others may explain why HR participants sought more covert RS but not overt RS and is consistent with patterns of concealment in OCD (Neal & Radomsky, 2015; Newth & Rachman, 2001). In summary then, increased responsibility may increase RS behaviour and partner-reported RS but may occur mostly through subtle means to avoid easy detection.

The present study’s findings are generally consistent with previous theoretical and experimental work in this domain. In line with predictions from Rachman’s cognitive model of compulsive checking (2002), and with the conceptualization of RS as a form of checking by proxy, HR participants reported greater urges to seek reassurance and actually sought more reassurance than LR participants. The data also highlight the key role that responsibility plays in OCD (Parrish & Radomsky, 2010; Salkovskis, 1985, 1999). There are a large number of OCD symptoms which are caused by manipulations of responsibility. The present experiment replicates previous research, which found that increased responsibility leads to increased compulsive checking (Arntz et al., 2007; Boschen & Vuksonavic, 2007; Bouchard et al., 1999; Ladouceur et al., 1995, Parrish & Radomsky, 2006, 2011; Reeves et al., 2010) and urges to seek reassurance (Parrish & Radomsky, 2006, 2011). Importantly, the present study extended these findings by observing that responsibility causes actual RS, as well, especially using a somewhat more ecologically valid scenario (e.g., dishwashing and decision-making about the cleanliness of cups from which someone may drink). It utilized not only self-report measures of RS but also behavioural measures of both overt and covert RS with an objectively-coded version of the RSC (Neal & Radomsky, 2015). Findings suggest that responsibility may have more effect on behavioural outcomes (as observed in the objectively-coded and confederate-reported RS) and less effect on self-reported RS.

7.2. Challenges faced

The present study had some challenges which limited the generalizability of our findings. The sample consisted mostly of undergraduate
women recruited from a department-run pool of participants, which limits generalizability. There may have been demand characteristics such that the observed differences in responsibility between the HR and LR participants in the manipulation check reflected participants’ intentions to comply with their perception of the experimenter’s expectations shortly after having been assigned to their responsibility condition and/or purpose of the experimental manipulation rather than reflecting deep changes in how responsible for the proper completion of the task they really felt. That is, they may have perceived that the experiment was attempting to manipulate responsibility, and because they were in a given assigned condition, they answered in a way that was consistent with their expectations but not with their actual perceptions of how responsible they felt. Additionally, responsibility and urges to seek reassurance were measured with only single item prompts. Although these measures and methods of measurement were adapted from previous experiments of responsibility and RS (Neal & Radomsky, 2015; Parrish & Radomsky, 2006, 2011), they may have been too simplistic a method to fully encapsulate these complex constructs. We did not ask the participants to report the degree to which they felt the confederates were responsible; this somewhat limits our ability to conclude that the observed interaction between time and reassurance seeking behaviour was the result of a perceived transfer of responsibility. While all participants rated the believability of the confederate’s responses as at least somewhat believable, the interaction may still have been perceived as more artificial than conversations participants may have with significant others. Additionally, questions to assess the believability of other aspects of the experiment (e.g., video recording failure) were not included. That being said, no participant gave a rating of 0 for the believability of the confederate’s responses. Only one participant gave a credibility rating of 0 and five participants were missing data for the credibility check of the dirtiness of the mock contaminant. The data from these participants were excluded from the analyses, which indicates that all participants were at least somewhat convinced by the dirtiness of the garbage and the believability of the confederate. Finally, a similarly-designed study could be conducted with a clinical sample to collect more conclusive evidence of the functional role of perceptions of responsibility to prevent harm in leading to and maintaining excessive RS in those suffering from OCD. Therefore, the obtained results should be interpreted with caution.

7.3. Solutions

Future investigators may wish to consider several possible adjustments when examining RS in a similar context. A video-recorded RS opportunity would allow for a more sophisticated analysis of nonverbal behaviour indicative of RS. The present experiment focused on the relationship between responsibility and RS. Responsibility conditions did not differ on various measures of symptomatology. However, it is entirely possible that some of the symptoms or maladaptive beliefs measured by the screening tools could interact with state-induced manipulations of responsibility to produce patterned differences in RS. Future research could investigate these possible interactions. Additionally, this experiment provides further evidence in support of cognitive interventions that target responsibility in the clinic to decrease RS. An examination of the impact of a clinical intervention to reduce responsibility on subsequent RS symptomatology is warranted. Based on this and previous literature in this area, interventions could be improved and more strategically implemented to better target responsibility in the context of RS. Their impact on RS has the potential to expand the scope of existing CBT interventions for OCD and foster new research into the phenomenology, function, and treatment of excessive RS in OCD.

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References


