



# An exploration of the relationship between mental pollution and OCD symptoms

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## Abstract

Rachman [(1994). Pollution of the mind. *Behaviour Research and Therapy*, 32, 311–314] theorized that a subtype of compulsive washing exists which has its compulsions triggered by feelings of internal dirtiness, or ‘mental pollution’. Since this construct was proposed, few empirical studies have examined it in relation to obsessive–compulsive contamination fear. This study represents a validation of the Mental Pollution Questionnaire (MPQ), which was developed for the measurement of mental pollution. Psychometric data were obtained from two studies using non-clinical samples. The final version of the MPQ consisted of eight items and two subscales related to washing and ideation. Higher mental pollution scores were associated with greater obsessions, contamination, and washing symptoms. In addition, MPQ scores were positively associated with inflated responsibility beliefs and thought–action fusion. Lastly, a third study found that both MPQ subscales predicted OC symptoms after controlling for general distress, trait guilt, and disgust sensitivity. Potential uses of the MPQ as a clinical and research instrument are discussed.

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**Keywords:** Obsessive–compulsive disorder; Washing; Mental pollution; Contamination

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## 1. Introduction

The fear of contamination has been defined as “an intense and persisting feeling of having been polluted or infected or endangered as a result of contact, direct or indirect, with a person/place/object that is perceived to be soiled, impure, infectious or harmful” (Rachman, 2004, p. 1229). Obsessive–compulsive disorder (OCD) patients with contamination fear generally wash excessively in order to feel that they or someone else is clean and/or safe. The fear of contamination figures prominently in approximately half of all cases of obsessive–compulsive disorder (Rachman & Hodgson, 1980; Rasmussen & Eisen, 1992).

Preliminary evidence suggests that OCD patients presenting with washing compulsions respond less well to CBT (Coelho & Whittal, 2001) or pharmacotherapy (Alarcon, Libb, & Spittler, 1993) than patients with other compulsions. Several possible explanations may account for the refractory nature of washing compulsions in OCD. These include: (a) the three-fold higher prevalence of comorbid personality disorders observed for compulsive washers relative to compulsive checkers (Horesh, Dolberg, Kirschenbaum-Aviner, & Kotler, 1997); (b) greater levels of overvalued ideation; and (c) the presence of mental pollution.

Rachman (1994) introduced the concept of *mental pollution* as a source of dirtiness contributing to contamination fear. He defined mental pollution as “a sense of internal uncleanness which can and usually does arise and persist regardless of the presence or absence of external, observable dirt” (Rachman, 1994, p. 311). OCD patients displaying mental pollution concerns may gain little relief from cleaning because the source and bodily location of dirtiness is less identifiable and less likely to be “fixed” by cleaning. Additional characteristics that distinguish mental pollution from other sources of contamination include the presence of repugnant or blasphemous thoughts, unacceptable sexual or aggressive impulses, sexual contact, and immoral people/places (see Fairbrother, Newth, & Rachman, 2005). An OCD patient displaying mental pollution may have a blasphemous thought that leads him to wash his hands ritualistically. Another washer may have her compulsions triggered by the recollection of unwanted sexual advances. The classic example of mental pollution is Lady Macbeth, who washed her hands repeatedly to remove the “dirt” caused by a guilty conscience.

Since its introduction (Rachman, 1994), a few studies of mental pollution have appeared (Fairbrother et al., 2005; Fairbrother & Rachman, 2004). Mental pollution was first investigated empirically in a sample of 50 victims of sexual assault. Using a semi-structured mental pollution interview, 60% of the study participants reported some feelings of mental pollution following the assault, and these feelings were associated with post-assault washing behavior (Fairbrother & Rachman, 2004). The authors also asked participants to think about a pleasant memory and the memory of the assault. Participants reported stronger feelings of dirtiness and a greater urge to wash in response to the assault memory than to the pleasant memory. Furthermore, following a period in which participants were allowed to go to the bathroom, nine women (18%) reported that they had washed their hands in response to the recollection of the assault.

In a recent experimental study investigating mental pollution, Fairbrother et al. (2005) had female undergraduates listening to an audiotope description of a consensual kiss at a party from an attractive male. After listening to the description once, they completed a questionnaire and were then randomized to one of four experimental listening scenarios:

(a) consensual kiss again; (b) non-consensual kiss by a man described as dirty and smelly (physical contamination condition); (c) non-consensual kiss in which the participant was told she felt trapped and immobilized ('mental defeat' condition); or (d) non-consensual kiss with no further description. No differences were found between the non-consensual conditions, so they were collapsed for the analyses. Compared to those assigned to the consensual kiss condition, those in the non-consensual conditions reported significantly greater internal and external dirtiness, a greater urge to wash, and greater general distress. Moreover, 8 of the 91 participants in the non-consensual conditions, but only 1 of the 30 participants in the consensual condition, reported washing their hands or rinsing their mouths to rid themselves of the feelings of mental pollution.

The aforementioned studies suggest that mental pollution can be induced without physical contact with a contaminant, and that internal feelings of dirtiness lead to increased urges to wash. However, in both studies, the provocation of internal feelings of dirtiness was achieved through exposure to unwanted sexual contact. A very recent study found that individuals asked to focus on an unethical deed they had previously committed were more likely to report cleansing related words in a word completion task than individuals who focused on an ethical deed (Zhong & Liljenquist, 2006). Those asked to focus on unethical deeds also expressed a greater desire for cleaning products and were more likely to use antiseptic wipes that were provided. Lastly, if after focusing on an unethical deed, participants were allowed to cleanse their hands, they were less likely to volunteer for another study than participants who did not cleanse (i.e., they were less likely to show helping behavior). This series of studies, thus, gives strong evidence for the role that outward cleansing may play in alleviating feelings of guilt. However, it remains unclear how these findings may apply to an understanding of compulsive washing symptoms, rather than normal handwashing.

Other research that is relevant to mental pollution relates to the emotions of guilt and disgust. Several studies have established associations between these constructs and OC symptoms. Disgust has been linked specifically to washing compulsions (Cougle, Wolitzky-Taylor, Lee, & Telch, 2007; McKay, 2006; Olatunji, Sawchuk, Lohr, & de Jong, 2004; Tolin, Woods, & Abramowitz, 2006), while guilt has been connected to general OC symptoms (Shafran, Watkins, & Charman, 1996). Recently, Mancini and Gangemi (2004) proposed that fear of guilt from behaving irresponsibly is a central motivator of most OC behavior. Guilt and disgust may lead to or co-occur with mental pollution, and both emotions may be provoked by disturbing thoughts or images. The relationship between these constructs and mental pollution has important implications for both theory and treatment.

The aim of the three studies presented below was three-fold: (a) to develop an instrument for assessing mental pollution; (b) to examine the linkage between scores on the mental pollution scale and OCD-relevant measures; and (c) to demonstrate the distinctness of this measure from inventories of guilt and disgust.

## **2. Study 1**

The aim of Study 1 was to develop a questionnaire assessing mental pollution using a large undergraduate population. Eleven items tapping feelings of internal dirtiness were subjected to an exploratory factor analysis. Items were deleted if they showed either poor item-total correlations or poor factor loading.

## 2.1. Methods

### 2.1.1. Participants

Two hundred and eight undergraduates (61.1% female) enrolled in an introductory psychology course at a large Southwestern university participated in this study in order to earn credit toward a research requirement. Participants ranged in age from 18 to 43 ( $M = 19.45$ ,  $S.D. = 5.3$ ) and consisted of diverse ethnic groups: Caucasian (64.7%), Asian/Pacific Islander (18.4%), Hispanic (11.6%), African American (1.6%), and other (3.2%). All participants completed an online, computerized version of a large questionnaire battery which incorporated the initial 11-item Mental Pollution Questionnaire. This online battery took approximately 45 min to complete.

### 2.1.2. Measures

The initial version of the Mental Pollution Questionnaire (MPQ; author constructed) comprised 11 statements which respondents rated on a 1 (Strongly disagree) to 7 (Strongly agree) scale. Before rating the items, respondents were told “The following statements refer to experiences that people have in their daily lives. Please choose the number matching the answer that best describes how much each statement is true of you.” The 11 items were generated to assess feelings of dirtiness, which was defined as perceived dirtiness in response to internal stimuli, such as thoughts, images, and emotions. These initial items were constructed based on [Rachman's \(1994\)](#) original article on mental pollution and were made to closely conform to his description of the phenomenon. We sought to assess both internal and external symptoms associated with mental pollution. Six of the items assessed handwashing behavior associated with internal dirtiness (e.g., ‘I wash my hands when I feel guilty’), which was thought to be a common manifestation of mental pollution; whereas five items were concerned purely with internal dirtiness not necessarily associated with washing (e.g., ‘Certain thoughts or images can make me feel dirty’).<sup>1</sup> Copies of the MPQ are available from the corresponding author.

## 2.2. Results

### 2.2.1. Item validity

The initial 11-item MPQ was examined using item-total correlations. These correlations ranged from .56 to .69, suggesting adequate item validity. Cronbach's alpha was .89 for these 11 items.

### 2.2.2. Factor structure

Exploratory factor analysis was carried out based on maximum likelihood extraction with varimax rotation. Rotated factor matrix and factor loadings for each item are presented in [Table 1](#). Items loading on multiple factors or on none of the extracted factors were eliminated. Eight items displaying distinctive factor loadings above .50 were retained for the final version of the MPQ. Consequently, eight items representing two distinct factors remained as candidate items for the final version of the MPQ. These two factors explained 56.2% of the total variance. The chosen eight items were again subjected to a maximum likelihood factoring with varimax rotation. The two-factor solution was

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<sup>1</sup>We would like to thank Dr. Rachman for suggesting six of the items.

Table 1  
Rotated factor matrix of the initial version of the MPQ

	Factor 1	Factor 2
1. I wash my hands when I have an obscene thought, idea, or impulse	.79	.20
2. I wash my hands when I feel guilty	.81	.23
3. Sometimes I feel dirty inside	.32	.66
4. I wash my hands after doing something I feel is morally wrong	.71	.22
5. When I recall certain memories it leaves me feeling dirty	.16	.83
6. I feel that I am a bad person if I do not wash my hands thoroughly	.69	.22
7. I wash my hands after simply thinking about garbage, feces, insects, or any other dirty item	.53	.18
8. Sometimes I continue to feel dirty no matter how many times I wash my hands	.69	.29
9. Certain thoughts or images can make me feel dirty	.15	.81
10. I can feel dirty even if I know that I haven't actually touched anything that is dirty	.41	.53
11. For me, feeling dirty inside and feeling shameful go together	.28	.62
% of variance explained	31.2	25.1

replicated using the eight items. The two factors explained 61.2% of the total variance (32.7% and 29.5%, respectively). Factor 1 (item # 1, 2, 4, and 6) pertained to washing rituals performed in response to perceived mental pollution, and factor 2 (item # 3, 5, 9, 11) pertained to a sense of inward contamination not connected to washing behavior. Cronbach's alpha was .86 for the total eight-item scale, and .86 and .85 for Factor 1 (i.e., mental pollution–washing) and Factor 2 (i.e., mental pollution–ideation), respectively.

3. Study 2

The aim of this study was to examine the reliability (both test–retest and internal consistency) of the MPQ and perform confirmatory factor analysis on the revised scale using a second undergraduate student sample. In addition, we sought to examine correlates of mental pollution using an OC symptom measure and cognitive measures theoretically related to OCD. We predicted that after controlling for general distress, the MPQ would be significantly associated with the contamination and obsessing subscales of the OC inventory, moral thought–action fusion (TAF), and inflated responsibility beliefs.

3.1. Methods

3.1.1. Participants

Two hundred and fifty-seven undergraduates (72.5% female) at a large Southwestern university participated in this study in order to earn credit toward a research requirement for an introductory psychology class. Participants ranged in age from 17 to 27 (*M* = 19.45, *S.D.* = 5.3) and consisted of diverse ethnic groups: Caucasian (55.7%), Asian/Pacific Islander (22.6%), Hispanic (14.5%), African American (3.6%), and other (3.2%). All participants completed an online, computerized version of a large questionnaire battery which included several additional measures not used in the present study. This battery took approximately 45 min to complete.

### 3.1.2. Measures

3.1.2.1. *Mental Pollution Questionnaire (MPQ; author constructed)*. The revised eight-item version of the MPQ (see Study 1) was administered to participants.

3.1.2.2. *Beck Depression Inventory—II (BDI-II; Beck, Steer, & Brown, 1996)*. The BDI-II is a 21-item self-report measure designed to assess symptoms of major depression. The reliability and validity of the BDI have been comprehensively validated and reviewed (Beck, Steer, & Garbin, 1988). The BDI-II is the latest version of the measure which reflects changes in diagnostic criteria for major depressive disorders (MDD) in the DSM-IV.

3.1.2.3. *State–Trait Anxiety Inventory—Trait Version (STAI-T; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983)*. The STAI-T is a 20-item measure assessing trait anxiety. It has demonstrated sound reliability and validity (Spielberger et al., 1983).

3.1.2.4. *Responsibility Attitudes Scale (RAS; Salkovskis et al., 2000)*. The RAS is a 26-item instrument used to assess beliefs about inflated responsibility. Statements such as “I often feel responsible for things that go wrong” are rated on a 1 (Totally disagree) to 7 (Totally agree) scale. Salkovskis et al. (2000) found the RAS to possess good reliability and validity.

3.1.2.5. *Thought–Action Fusion Scale (TAFS; Shafran, Thordarson, & Rachman, 1996)*. The TAFS is a 19-item self-report measure assessing the tendency to fuse thoughts and actions. Respondents rate each item on a 5-point scale ranging from 0 (Disagree strongly) to 4 (Agree strongly). Twelve items assess moral TAF (e.g., “Having violent thoughts is almost as unacceptable to me as violent acts”), while seven items assess likelihood TAF (e.g., “If I think of a relative/friend losing their job, this increases the risk that they will lose their job”) related to oneself or to others. This two-factor solution has received empirical support (Shafran, Thordarson et al., 1996; Shafran, Watkins et al., 1996), and the TAFS has exhibited good psychometric properties.

3.1.2.6. *Vancouver Obsessive–Compulsive Inventory (VOCI; Thordarson et al., 2004)*. The VOCI is a 55-item self-report instrument measuring obsessions, compulsions, avoidance behavior, and personality characteristics related to OCD. The VOCI has been found to have good test–retest reliability and internal consistency, and support has been found for a six-factor solution comprising the following factors: contamination, checking, obsessions, hoarding, just right experiences, and indecisiveness (Thordarson et al., 2004).

## 3.2. Results

### 3.2.1. Item validity and internal consistency

Internal-consistency and item-total correlations were examined. Moreover, the two-factor structure of the MPQ was evaluated based on confirmatory factor analysis.

The corrected item-total correlations ranged from .56 to .69, suggesting adequate item validity. Cronbach’s alpha was .86 for the total scale, and .87 and .85 for Factor 1 (i.e., mental pollution–washing) and Factor 2 (i.e., mental pollution–ideation), respectively.

3.2.2. Confirmatory factor analysis

Confirmatory factor analysis was conducted employing Analysis of Moment Structures (AMOS), Version 4.01. We examined several fit indices, including the  $\chi^2$ , the Goodness of Fit Index (GFI; Jöreskog & Sörbom, 1996), the Adjusted Goodness of Fit Index (AGFI; Jöreskog & Sörbom, 1996), the Comparative Fit Index (CFI; Bentler, 1990), the Tucker–Lewis Index (TLI; Bentler & Bonett, 1980), and the root mean square error of approximation (RMSEA; Browne & Cudeck, 1993).

The results of CFA demonstrated a good fit of the two-factor model:  $\chi^2 (N = 257) = 46.30, p < .01$ ; GFI = .95; AGFI = .91; CFI = .98; TLI = .96; RMSEA = .08. We also tested the goodness-of-fit of a one-factor unidimensional solution as an alternative model. However, this procedure resulted in a poorer fit:  $\chi^2 (N = 257) = 301.85, p < .01$ ; GFI = .72; AGFI = .51; CFI = .75; TLI = .66; RMSEA = .23.

3.2.3. Test–retest reliability

Test–retest reliability estimates were based on 18 students with significant contamination fear. These students participated in a separate study examining ERP treatment. To have qualified for the study, they had to report significant fear on contamination-related behavioral approach tests, had to report scores of 5 or greater on the OCI-R washing subscale, and also had to be willing to undergo ERP treatment. The mean test–retest interval was 15 days (range 2–28 days) and administration at both time points occurred prior to receiving any treatment. Reliability estimates were calculated using Pearson  $r$  between scores on the first and second administration. Overall, the total scale score ( $r = .88, p < .0001$ ) and both subscales (washing:  $r = .90, p < .0001$ ; ideation:  $r = .82, p < .0001$ ) displayed good test–retest reliability.

3.2.4. Relationship between mental pollution and OCD symptoms and beliefs

Means and standard deviations of study measures are presented in Table 2. Zero-order correlations among measures and their partial correlations after controlling for depression and anxiety are presented in Table 3. Consistent with predictions, correlations between

Table 2  
Means and standard deviations of Study 2 measures

	Mean (S.D.)
BDI-II	7.87 (8.4)
STAI-T	49.79 (2.5)
TAF-M	15.4 (10.9)
TAF-LO	2.29 (3.3)
TAF-LS	2.12 (2.6)
RAS	98.15 (22.4)
Total VOI	33.12 (33.4)
MPQ-W	6.45 (4.1)
MPQ-I	11.72 (6.4)

BDI-II, Beck Depression Inventory; STAI-T, State–Trait Anxiety Inventory (Trait Subscale); TAF-M, Moral Thought–Action Fusion; TAF-LO, Likelihood Thought–Action Fusion—Others; TAF-LS, Likelihood Thought–Action Fusion—Self; VOI, Vancouver Obsessive–Compulsive Inventory; MPQ-W, Mental Pollution Questionnaire—Washing; MPQ-I, Mental Pollution Questionnaire—Ideation.

Table 3

Zero-order correlations between Study 2 measures and partial correlations after controlling for depression and anxiety

	MPQ-W	MPQ-I	TAF-M	TAF-LO	TAF-LS	RAS	VOCI-Obsess	VOCI-Contam	BDI-II
MPQ-I	.52** (.50**)								
TAF-M	.27** (.22**)	.37** (.34**)							
TAF-LO	.50** (.47**)	.36** (.33**)	.35** (.32**)						
TAF-LS	.42** (.37**)	.33** (.29**)	.33** (.30**)	.76** (.74**)					
RAS	.36** (.32**)	.48** (.41**)	.44** (.43**)	.32** (.25**)	.30** (.28**)				
VOCI-Obsess	.46** (.45**)	.44** (.33**)	.26** (.21**)	.52** (.49**)	.48** (.47**)	.45** (.35**)			
VOCI-Contam	.51** (.49**)	.36** (.27**)	.29** (.27**)	.46** (.42**)	.47** (.44**)	.33** (.26**)	.62** (.59**)		
BDI-II	.17*	.40**	.15*	.24**	.14*	.34**	.45**	.23**	
STAI-T	.03	.10	.09	.08	.04	.16*	.15*	.08	.27**

MPQ-W, Mental Pollution Questionnaire—Washing; MPQ-I, Mental Pollution Questionnaire—Ideation; TAF-M, Moral Thought–Action Fusion; TAF-LO, Likelihood Thought–Action Fusion—Others; TAF-LS, Likelihood Thought–Action Fusion—Self; RAS, Responsibility Attitude Scale; VOCI-Obsess, Vancouver Obsessive Compulsive Inventory, Obsession subscale; VOCI-Contam, Vancouver Obsessive–Compulsive Inventory, Contamination subscale; BDI-II, Beck Depression Inventory, STAI-T; State–Trait Anxiety Inventory (Trait Subscale).

\* $p < .05$ .\*\* $p < .01$ .

both MPQ subscales and measures of responsibility, OC symptoms (obsession and contamination subscales) and thought–action fusion were significant, even after controlling for general distress. Neither subscale of the MPQ was significantly correlated with trait anxiety, though both were positively correlated with depressive symptoms.

Additional partial-correlation analyses were carried out to examine whether the relationship between the mental pollution subscales and OC symptoms was specific to obsession and contamination symptoms. Correlations between both MPQ subscales and each subscale of the VOCI were examined while controlling for anxiety, depression, and the five additional VOCI subscales not being directly tested. MPQ-wash was positively correlated with the VOCI-contamination subscale,  $r = .43$ ,  $p < .001$ , but the association between MPQ-ideation and the VOCI-contamination subscale was non-significant,  $r = .13$ ,  $p = .06$ . Both MPQ subscales (MPQ-ideation:  $r = .24$ ,  $p < .001$ ; MPQ-wash:  $r = .24$ ,  $p < .001$ ) were positively correlated with the VOCI-obsessions subscale. Among other VOCI subscales, no other significant associations with MPQ scores emerged, with the exception that the VOCI-hoarding subscale was negatively associated with MPQ-ideation,  $r = -.14$ ,  $p < .05$ . This association was very weak, however, and likely spurious.

In order to assess whether the associations between the MPQ and TAF and RAS scores were due to their common association with contamination symptoms, additional partial-correlation analyses were carried out controlling for anxiety, depression, and VOCI-contamination scores. MPQ-wash remained positively correlated with RAS ( $r = .23$ ,  $p < .001$ ), TAF-self ( $r = .20$ ,  $p < .005$ ), and TAF-others ( $r = .33$ ,  $p < .0001$ ), but it was not correlated with TAF-moral ( $r = .11$ ,  $p = .12$ ). MPQ-ideation remained positively correlated with RAS ( $r = .36$ ,  $p < .0001$ ), TAF-moral ( $r = .29$ ,  $p < .0001$ ), TAF-self ( $r = .20$ ,  $p < .005$ ), and TAF-others ( $r = .25$ ,  $p < .0005$ ).

## 4. Study 3

The aim of Study 3 was to demonstrate the distinctness of the construct of mental pollution, as measured by the MPQ, from the related constructs of guilt and disgust. Moreover, this follow-up study sought to demonstrate the incremental validity of the MPQ in predicting OCD symptoms beyond what can be predicted by these neighboring phenomena. We also sought to test the consistency of the relationship between mental pollution and OCD by including a well-established measure of OCD symptoms different from the scale used in Study 2.

### 4.1. Methods

#### 4.1.1. Participants

Eighty-four students (75.3% female) enrolled in an upper-level psychology course at a large Southwestern university participated in this study as part of an extra credit assignment. Participants ranged in age from 19 to 29 ( $M = 19.45$ ,  $S.D. = 5.3$ ) and consisted of diverse ethnic groups: Caucasian (64.3%), Asian/Pacific Islander (16.7%), Hispanic (11.9%), African American (2.4%), and other (4.8%). All participants completed an online questionnaire battery which included measures used in the present study along with other instruments. This questionnaire battery took approximately 30 min to complete.

#### 4.1.2. Measures

4.1.2.1. *Guilt Inventory—Trait Subscale (GI-trait; Kugler & Jones, 1992).* The GI is a 45-item measure which includes three subscales: moral standards, state guilt, and trait guilt. It has shown good psychometric properties (Kugler & Jones, 1992). Only the 20-item trait guilt subscale was used in the present study.

4.1.2.2. *The Disgust-Scale, Version 2, Short Form (DS-SF; Haidt, McCauley, & Rozin, 2002).* The DS-SF consists of eight items which were selected using regression analysis from the 32-item Disgust Scale Version 2 (Haidt et al., 2002). The second version of the DS was constructed to improve upon the original DS (Haidt, McCauley, & Rozin, 1994) in item selection and clarity, though it was found to predict willingness to engage in disgusting behavior as well as the original scale (Haidt et al., 2002). The first four items of the DS-SF are assessed on a 1 = Strongly disagree (very untrue about me) to 4 = Strongly agree (very true about me) scale and include statements such as “I try to avoid letting any part of my body touch the toilet seat in a public restroom, even when it appears clean.” The second four items are rated on a 1 (Not disgusting at all) to 4 (Very disgusting) scale and include scenarios such as “You take a sip of soda and then realize that you picked up the wrong can, which a stranger had been drinking out of.” The short form correlates highly with the long form ( $r = .90$ ) and consists of two items from the four domains of disgust assessed in the long form. The authors intended it to be used as a brief measure of global disgust sensitivity.

4.1.2.3. *Other measures.* The MPQ, BDI-II, STAI-T (see Study 2) and OCI-R (Foa et al., 2002) were also included in the questionnaire battery participants completed. The OCI-R is a widely used 18-item measure that assesses the degree to which participants are experiencing obsessive–compulsive symptoms. It possesses six subscales, including subscales measuring obsessing and washing symptoms.

## 4.2. Results

#### 4.2.1. Relationship between mental pollution, guilt, and disgust

The MPQ-washing subscale was not significantly correlated with the DS-SF,  $r = .18$ ,  $p = .10$ , or the GI-trait,  $r = .18$ ,  $p = .10$ . MPQ-ideation scores were strongly correlated with the GI-trait,  $r = .59$ ,  $p < .001$ , but its association with the DS-SF only approached significance,  $r = .21$ ,  $p = .06$ .

#### 4.2.2. Relationship between mental pollution and OCD symptoms

Zero-order correlation and partial-correlation analyses (controlling for depression and trait anxiety) revealed that MPQ-wash was correlated with the OCI-washing subscale ( $r = .64$ ,  $p < .0001$ ; partial  $r = .56$ ,  $p < .0001$ ), but not the OCI-obsessing subscale. Further, MPQ-ideation was correlated with OCI-obsessing ( $r = .52$ ,  $p < .0001$ ; partial  $r = .41$ ,  $p < .001$ ), but its association with OCI-washing ( $r = .24$ ,  $p < .05$ ) was made non-significant after controlling for general distress (partial  $r = .10$ ,  $p > .40$ ).

#### 4.2.3. Incremental validity of the MPQ in predicting OCD symptoms

Regression analyses were performed to assess whether the previous association found between the MPQ and washing and obsessing subscales would be present after controlling

for general distress, guilt, and disgust. Neither age nor gender was correlated with mental pollution or OC symptoms and so were not considered in the regression analyses. In the first analysis, the OCI-R obsessing subscale was used as the dependent variable, BDI-II and STAI-T, GI-trait and DS-SF scores were entered into step 1, and both MPQ subscales were entered into step 2. In step 1, general distress, guilt and disgust accounted for 28.3% of the variance in OCI-R-obsessing ( $R^2 = .283$ ,  $F = 7.40$ ,  $p < .0001$ ). In step 2, the MPQ subscales accounted for 7.8% of the variance in OCI-R-obsessing ( $R^2 = .078$ ,  $F = 4.46$ ,  $p < .05$ ). Among these subscales, only MPQ-ideation significantly predicted OCI-R-obsessing ( $\beta = .15$ ,  $t = 2.99$ ,  $p < .005$ ).

This regression analysis was repeated, with the exception that the OCI-R-washing subscale was used as the dependent variable. In step 1, general distress, guilt, and disgust accounted for 20.0% of the variance in OCI-R-washing ( $R^2 = .200$ ,  $F = 4.64$ ,  $p < .005$ ). In step 2, the MPQ subscales accounted for 25.4% of the variance in OCI-R-washing ( $R^2 = .254$ ,  $F = 16.80$ ,  $p < .0001$ ). Among these subscales, only MPQ-washing significantly predicted OCI-R-washing scores ( $\beta = .55$ ,  $t = 5.67$ ,  $p < .0001$ ).

## 5. General discussion

The findings of the three studies suggest that the MPQ is a reliable and valid measure of mental pollution, or feelings of internal dirtiness. The eight items of the MPQ fell into two coherent factors that accounted for a large proportion of the total variance. One factor appears to assess internal dirtiness which the individual attempts to relieve through washing, while the second factor assesses an ideational form of mental pollution that is not necessarily linked to washing or other behavior.

This investigation also provides additional support for the relationship between mental pollution and OCD symptoms and preliminary support that mental pollution is associated with beliefs linked to OCD. Consistent with predictions, both subscales of the MPQ were found to be associated with contamination and obsession symptom subscales from two well-established OCD symptom measures, after controlling for general distress. In addition, after controlling for all other OC symptom subscales, both subscales of the MPQ were associated with obsession symptoms, while only the MPQ-washing subscale was associated with contamination symptoms. This suggests that the association between the MPQ-washing subscale and OCD symptoms, or obsession symptoms in particular, is not due to the overlap of its items with those from the contamination subscale.

Findings from Study 3 provide support for the incremental validity of the MPQ in predicting OCD symptoms beyond that which is predicted by measures of disgust sensitivity and trait guilt. The washing subscale of the MPQ was not significantly correlated with disgust or guilt, but the MPQ-ideation subscale was strongly and positively correlated with guilt. This relationship was expected, given the overlap between the constructs. After controlling for general distress, guilt, and disgust, the MPQ-ideation subscale remained positively associated with obsessing symptoms and the MPQ-washing subscale remained positively associated with washing symptoms. These findings, when taken together, provide evidence for the distinctiveness of the MPQ and its association with OC symptoms.

After controlling for general distress, both subscales of the MPQ were positively associated with moral thought–action fusion and thought–action fusion beliefs related to harm to others. It is possible that the association between the two constructs could be

accounted for by their common relationship with OC symptoms, though a follow-up analysis indicated that after controlling for scores on the contamination subscale of the VOCI, the association between both MPQ scales and likelihood TAF remained significant, as did the association between MPQ-ideation and moral TAF. A second possibility is that both phenomena may co-occur among individuals who attach an over-importance to thoughts. Compulsive washers suffering from mental pollution may have specific thoughts or images that evoke feelings of dirtiness and an urge to wash.

The MPQ was also associated with a measure of inflated responsibility beliefs (RAS), such that greater inflated responsibility beliefs were predictive of greater mental pollution. Furthermore, analyses revealed that their relationship was not due to their common association with contamination symptoms. Inflated responsibility is an important feature of the cognitive model of OCD (Salkovskis, 1985, 1999). Many individuals with inflated responsibility beliefs feel the need to have absolute control over their mental life. Perhaps these individuals are prone to experience feelings of internal dirtiness after having an unwanted repugnant thought for which they feel responsible. Based on this formulation, inflated responsibility beliefs might operate as a vulnerability factor for the experience of mental pollution.

Though the three studies examined mental pollution only in a non-clinical sample, the findings of this investigation may still be relevant to clinicians treating OC patients with a mental pollution profile. OC patients with mental pollution may represent a subtype of OCD requiring a more comprehensive approach to treatment which extends beyond traditional exposure and response prevention and targets a number of OC-relevant cognitive variables (e.g., intolerance of uncertainty, perfectionism, and overestimation of threat). For instance, the association found between TAF and the MPQ suggests that some of the methods used to treat thought–action fusion (see [Rachman, 2004](#)) could be effectively used in treating feelings of internal dirtiness. Clinicians may evoke the urge to wash in patients with mental pollution by asking them to write a statement wishing harm on someone, write about a past unethical deed (e.g., [Zhong & Liljenquist, 2006](#)), or by using imaginal exposure with repulsive images. Given the observed linkage between inflated responsibility beliefs and the MPQ, techniques used to challenge these beliefs (see [Clark, 2004](#); [Salkovskis, 1999](#)) might also prove beneficial in attenuating patients' mental pollution. Finally, given the established connection between mental pollution and unwanted sexual acts ([Fairbrother & Rachman, 2004](#)), interventions aimed at reducing guilt or shame associated with these acts might prove helpful in reducing mental pollution and its associated consequences. Therapists treating victims of sexual assault may wish to administer the MPQ as part of an assessment battery, as mental pollution is likely a common but rarely addressed consequence of assault.

Several study limitations deserve mention. First, the use of a non-clinical sample limits conclusions regarding the relationship between mental pollution and OC symptoms. Though non-clinical samples are often used in OCD research and several studies have demonstrated commonalities between non-clinical and OCD samples in the characteristics of their obsessions, compulsions, and beliefs about intrusions (see [Gibbs, 1996](#), for a review), studies using the MPQ with clinical samples are needed. Second, our samples comprised a high percentage of women, and thus our findings may not generalize to men. Third, although, hand washing is the most common form of washing/cleaning rituals, the MPQ-washing subscale does not assess other forms of cleaning such as washing the face or other parts of the body. Most importantly, because of the correlational nature of this

study, causal inferences regarding the relationship between mental pollution and OC symptoms await prospective and experimental investigations.

The MPQ has several potential uses as a tool for research in OCD and other forms of psychopathology. For example, the MPQ might (a) assist investigators interested in assessing the prevalence of mental pollution across different OCD subtypes; (b) serve as an outcome measure for interventions targeting the reduction of mental pollution; and (c) serve as a potential moderator variable in studies attempting to predict therapeutic response to psychosocial treatments, pharmacotherapy, or their combination. Moreover, given the preliminary evidence suggesting that mental pollution may develop as a sequelae to sexual assault (Fairbrother et al., 2005; Fairbrother & Rachman, 2004), possible linkages between mental pollution and PTSD as well as mental pollution and sexual dysfunction should be examined. These and other investigations will help further illuminate the role of mental pollution in psychopathology and its treatment.

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