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Mental contamination: The effects of imagined physical dirt and immoral behaviour

Shorter Communication

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## Abstract

There is a growing body of empirical support for Rachman's (1994, 2004, 2006) conceptualization of mental contamination. The aim of this study was to tease apart manipulations of imagined physical descriptions (i.e., clean versus dirty), in the context of both morally sound and reprehensible acts (i.e., consensual versus non-consensual kiss) to expand our understanding of the experimental variables which may evoke mental contamination and address limitations of previous research. Female undergraduate student participants ( $n = 140$ ) were randomly assigned to listen to one of four audio recordings and imagine receiving either a consensual or non-consensual kiss from a man described as either physically clean or physically dirty. Results indicated that participants who imagined a non-consensual kiss from a physically dirty man reported the greatest feelings of mental contamination; whereas, participants who imagined a consensual kiss from a physically clean man reported the lowest feelings of mental contamination. However, there were few significant differences in mental contamination feelings between those who imagined a consensual kiss from a physically dirty man and those who imagined a non-consensual kiss from a physically clean man. Results are discussed in terms of cognitive-behavioural conceptualizations of and treatments for contamination fears.

Key words: OCD; mental contamination; fear of contamination; washing behaviour; PTSD.

Mental contamination: The effects of imagined physical dirt and immoral behaviour

A fear of contamination has been conceptualized to include intense, persistent physiological and emotional components (Rachman, 1994, 2004, 2006). In particular, these components may involve feelings of dirtiness and urges to wash, as well as negative emotions such as anxiety and disgust. Akin to some of the functional mechanisms underlying anxiety and disgust, individuals suffering from persistent fears of contamination are proposed to engage in avoidance behaviour, as well as repeated washing behaviour. Two primary categories have been identified by Rachman under the umbrella of fears of contamination: contact contamination and mental contamination.

Contact contamination involves external feelings of dirtiness evoked by physical contact with a readily identifiable contaminant such as dirt, disease and/or germs (Rachman, 2004, 2006). Mental contamination, however, involves internal, psychological feelings of dirtiness evoked without physical contact (e.g., by thoughts, images, memories, etc.). The mental contaminant may involve another person or oneself, and the person concerned is normally perceived to be immoral (i.e., immoral human source). Mental contamination situations may involve psychological violations (e.g., betrayal), physical violations (e.g., sexual assault), self-contamination (e.g., self-generated blasphemous, sexual and/or violent obsessions), visual contamination (e.g., by sight alone) and the related visual phenomenon of morphing (i.e., a fear of acquiring the characteristics of an immoral/undesirable person).

Although there are many features which distinguish contact from mental contamination, they are not mutually exclusive as there is overlap found between them (Coughtrey, Shafren, Lee, & Rachman, 2012; Rachman, 2004, 2006). For reasons related to this overlap, ‘contaminants’ in mental contamination are likely to exist beyond immoral human sources. For example, an individual who *generates images of or remembers* touching a dirty stimulus not associated with

immorality, and consequently experiences feelings of contamination, would be experiencing mental, not contact contamination (Rachman, Radomsky, Elliott, Shafran, & Coughtrey, 2010). In other words, contact and mental contamination are likely primarily dissimilar in the manner they may be evoked (e.g., physical contact versus images, thoughts, etc.).

There is a growing body of empirical support for Rachman's (2006) conceptualization of mental contamination. Female victims of sexual assault have retrospectively reported feelings of mental contamination and engaged in repeated washing behaviour following the assault experience (Fairbrother & Rachman, 2004). Feelings of mental contamination persist independently from initial physical contact in that these women also reported experiencing feelings of dirtiness and urges to wash in the laboratory when they recalled their sexual assault experience, and a few engaged in washing behaviour (Fairbrother & Rachman, 2004). The presentation of OCD-related symptoms such as repeated washing following a significant trauma seems to demonstrate a functional relationship between OCD and posttraumatic stress disorder (PTSD; see Gershuny, Baer, Radomsky, Wilson, & Jenike, 2003). Mental contamination has also been evoked by imagined events in samples of undergraduates who imagined receiving, or forcing a non-consensual kiss (Elliott & Radomsky, 2009; Fairbrother, Newth, & Rachman, 2005; Herba & Rachman, 2007; & Rachman, Radomsky, Elliott, & Zysk, 2011).

One limitation of some of the previous experiments involved manipulating more than one relevant construct simultaneously. In particular, the combination of an imagined physically dirty perpetrator and a morally reprehensible act (e.g., he was described as having crumbs in the corner of his mouth and the kiss was described as non-consensual), and/or the combination of an imagined morally reprehensible act and immoral person co-occurred in the manipulation (see Fairbrother, Newth, & Rachman, 2005; Herba & Rachman, 2007). One study addressed limitations in dirty kiss studies by teasing apart the immorality of the perpetrator from the

immorality of the act (Elliott & Radomsky, 2009). Results indicated that an immoral, human source and a neutral event (e.g., a consensual kiss) in the absence of imagined physical dirt was sufficient to evoke mental contamination. However, there has been sparse research conducted to address the inclusion of both a physically dirty male and a morally reprehensible act.

The aim of the current study was to expand our understanding of the situational variables necessary/sufficient to evoke mental contamination, as well as to tease apart the imagined physical aspects of the man (e.g., smells good vs. smells bad), and the (im)moral aspects of the act (e.g., consensual vs. non-consensual kiss). We examined whether mental contamination could be evoked to a greater degree when an imagined situation involved both physical dirt (e.g., has “beer breath”) and unwanted sexual contact (e.g., non-consensual kiss), and whether feelings of mental contamination could be evoked by imagined physical dirt alone (e.g., thinking about a consensual kiss with a physically dirty man).

We hypothesized that participants in the non-consensual conditions would report mental contamination to a greater degree than participants in the consensual conditions, that participants who imagined receiving a kiss from a man described as physically dirty would report mental contamination to a greater degree than participants who imagined receiving a kiss from a man described as physically clean, and that participants who imagined receiving a forced, non-consensual kiss from a man described as physically dirty would report the experience of mental contamination to the highest degree.

## Method

### *Participants*

Female undergraduate students at Concordia University ( $n = 140$ ; mean age = 22.70;  $SD = 5.29$ ; range = 18 to 55 years) participated in this study. Each participant was randomly assigned to either an imagined consensual (C) or non-consensual (NC) kiss condition, involving receiving

either physically clean (PC) or physically dirty (PD) information about the appearance of the man whom they imagine to kiss them, such that they were assigned to either the CPC ( $n = 35$ ), CPD ( $n = 35$ ), NCPC ( $n = 35$ ) or NCPD ( $n = 35$ ) condition. Sexual orientation was assessed (Kinsey, Pomeroy, & Martin, 1948) given the imagined sexual acts involved in this study included members of the opposite sex. One participant in each of the CPC and CPD conditions, and two in the NCPC condition identified themselves as being exclusively homosexual; the sample was deemed generally appropriate for this experimental paradigm (i.e., none of these participants scored three standard deviations above or below their mean on any variable).

### *Measures*

*Beck Depression Inventory - 2* (BDI-II; Beck, Steer, & Brown, 1996), and *Beck Anxiety Inventory* (BAI; Beck & Steer, 1990). BDI-II assesses depressive symptoms during the past two weeks. In an undergraduate sample, internal consistency ( $\alpha = .93$ ), as well as convergent and divergent validity (Beck et al., 1996) have been demonstrated. BAI assesses anxiety symptoms during the past week. Excellent internal consistency ( $\alpha = .92$ ) has been demonstrated.

*Contamination Subscale of the Vancouver Obsessional Compulsive Inventory* (VOCI-CTN; Thordarson et al., 2004). VOCI-CTN is a 12-item subscale that assesses a fear of contact contamination such as direct physical contact with a contaminant, (e.g., I feel very dirty after touching money). Items are based on a 5-point (e.g., 0 to 4) likert scale. Internal consistency ( $\alpha = .87$ ;  $\alpha = .88$  in this sample), as well as convergent and divergent validity (Thordarson et al., 2004), and test-retest reliability ( $r = 0.90$ ; Radomsky et al., 2006) have been demonstrated in student samples.

*Mental Contamination Report* (MCR; Elliott & Radomsky, 2009): We administered a similar version of the MCR as used in Elliott & Radomsky (2009), with the addition of two manipulation check questions: the degree to which participants found the man to be physically

dirty before and after the kiss. The MCR also assessed participants' ratings of ease to imagine the scenario (e.g., an aggregate measure of how easy it was to imagine the scenario, how vividly the scenario was imagined and how realistic the scenario was found to be by participants), perceptions of kiss desirability, and four indices of mental contamination; all based on a scale from 0 to 100 for which 0 represented "not at all" and 100 represented "completely".

*Break Behaviour Questionnaire* (BBQ; Elliott & Radomsky, 2009): We administered a similar version of the BBQ as used in Elliott & Radomsky (2009), with the addition of one item to assess the use of hand sanitizer. Participants reported whether or not they engaged in any washing behaviour (e.g., rinsed mouth, cleansed hands, etc.) during the behavioural "bathroom break" task, as well as their reasons for engaging in this washing behaviour.

### *Procedure*

The procedure for this study was exactly the same as in Elliott & Radomsky (2009), except for the content of the audio recordings and the presence of hand sanitizer. Participants completed the BDI-II, BAI, and VOCI-CTN. They were then randomly assigned to one of four conditions (CPC, CPD, NCPC or NCPD) in which they listened to an audio recording (using headphones) involving an attractive man who administers either a consensual or non-consensual kiss and who is described as either physically clean or physically dirty (audio recording scripts are available by request from the corresponding author). Audio recording length ranged from three minutes 45 seconds, to three minutes 59 seconds, across conditions. Audio content was matched across conditions (i.e., those in the consensual conditions heard exactly the same descriptions of consensual information matched with either the clean or dirty information audio clips, and vice versa for the non-consensual conditions). Participants were asked to imagine that they were the woman described in the scenario and that the events were happening to them at that moment in time. A blind study design was employed such that the experimenter did not know to

which of the conditions the participants had been assigned. Following the imagined event, participants were asked to complete the MCR to assess feelings of mental contamination. A behavioural task was then administered in which participants were given a five minute break as a means of providing them with the opportunity to engage in washing behaviour and were then asked to complete the BBQ.

## Results

### *Sample characteristics*

Two participants in the CPC condition scored more than 3.29 standard deviations from the corresponding mean in their condition on more than one dependent variable, and thus were removed from the sample. There were no significant differences between conditions in terms of age, BDI-II, BAI or VOICI-CTN scores, or baseline ratings of disgust, anxiety or feelings of dirtiness (all  $F$ 's (3, 137) < 2.21; all  $p$ 's > .09). In this sample, 45% of participants reported experiencing a previous non-consensual sexual encounter (PNCSE) such as a kiss, and there were no significant PNCSE differences ( $\chi^2$  (3, 135) = 3.28;  $p$  = .35) between the CPC, CPD, NCPC and NCPD conditions ( $n$ 's = 11, 19, 17, and 15, respectively).

Ease to imagine the scenario ratings were based on an aggregate measure of the three items noted above ( $\alpha$  = .81). There were significant differences between the conditions in terms of ease for which participants imagined the scenario  $F$  (3, 134) = 5.20;  $p$  < .01. In particular, participants in the NCPD condition reported that it was significantly easier to imagine the scenario than did participants in the CPC ( $p$  = .047), CPD ( $p$  < .001) and NCPC ( $p$  = .03) conditions. There was a trend for participants in the CPC condition to report imagining the scenario more easily than those in the CPD ( $p$  = .06) condition, but CPC participants did not differ from those in the NCPC condition ( $p$  = .84). Finally, there was a tendency for participants in the NCPC condition to report a greater ease to imagine the scenario than participants did in the



CPD condition ( $p = .092$ ). Please see Table 1 for means and standard deviations. Ease to imagine the scenario ratings were entered as a covariate given significant group differences.

### *Manipulation checks*

#### *1. Perceived kiss desirability*

There was a significant effect of the covariate, ease to imagine the scenario scores, on kiss desirability scores  $F(1, 137) = 8.39, p < .01, \text{partial } \eta^2 = .06$ . There were also significant group differences on how desirable participants perceived the kiss  $F(3, 137) = 33.95, p < .001, \text{partial } \eta^2 = .43$ , after controlling for the covariate. Participants in the CPC and CPD conditions did not differ significantly from each other in terms of perceived kiss desirability ( $p = .31$ ). They did, however, report that the kiss was perceived as significantly more desirable than those in the NCPC ( $p$ 's  $< .001$ ) condition who in turn reported significantly greater perceptions of kiss desirability ratings than did those in the NCPD ( $p < .01$ ) condition. Please see Table 2 for means and standard deviations of all manipulation check variables.

#### *2. Pre-kiss perceived physical dirtiness of the man*

There was no significant effect of the covariate  $F(1, 137) = .23, p = .63, \text{partial } \eta^2 = .002$ ; however, there were significant group differences in terms of how physically dirty participants perceived the man to be, prior to the imagined kiss  $F(3, 137) = 31.94, p < .001, \text{partial } \eta^2 = .42$ , after controlling for the covariate. Participants in the NCPD condition reported significantly greater perceptions of the man being physically dirty before the kiss than participants in all other conditions (all  $p$ 's  $< .024$ ). Participants in the NCPC and CPC conditions did not differ significantly from each other ( $p = .36$ ), but participants in both conditions reported significantly lower pre-kiss perceptions of physical dirtiness of the man than did participants in the CPD ( $p$ 's  $< .001$ ) condition.

#### *3. Post-kiss perceived physical dirtiness of the man*

There was no significant effect of the covariate  $F(1, 137) = .63, p = .43, \text{partial } \eta^2 = .005$ ; however, there were significant group differences in terms of how physically dirty participants perceived the man to be, after the imagined kiss  $F(3, 137) = 103.00, p < .001, \text{partial } \eta^2 = .70$ , after controlling for the covariate. Each condition was significantly different from the others (all  $p$ 's  $< .01$ ) such that those in the NCPD condition reported the greatest post-kiss perceptions of physical dirtiness of the man, followed by those in the CPD, NCPC and CPC conditions, respectively. Note that participants in the CPD condition found the man to be significantly dirtier following the kiss than participants in the NCPC condition (see Figure 1 for ratings of perceptions of physical dirtiness of the man in each condition).

#### 4. Differences between pre- and post-physical dirtiness scores

There was no significant effect of the covariate  $F(1, 137) = .04, p = .84, \text{partial } \eta^2 < .001$ ; however, there were significant differences between the conditions on difference scores of pre- to post-kiss perceptions in physical dirtiness of the man  $F(3, 137) = 17.31, p < .001, \text{partial } \eta^2 = .28$ , after controlling for the covariate. In particular, there were no significant differences between the CPD, NCPC and NCPD (all  $p$ 's  $> .25$ ) conditions, but they were all significantly greater than ratings obtained in the CPC (all  $p$ 's  $< .001$ ) condition.

#### *Feelings of mental contamination*

We examined feelings of dirtiness, urges to wash, internal negative emotions (INE; e.g., shame), and external negative emotions (ENE; e.g., anger). An aggregate measure of five items (e.g., rinse mouth/spit/drink something, brush teeth/use mouthwash, wash face, wash hands and take a shower) was used ( $\alpha = .92$  in this study) to assess ratings of urges to wash. Negative emotions were separated into two components (see Herba & Rachman, 2007, and Elliott & Radomsky, 2009): INE ( $\alpha = .90$  in this study); e.g., feelings of being ashamed, guilty, humiliated, afraid, sad, cheap and sleazy), and ENE ( $\alpha = .88$  in this study); e.g., feelings of being

anxious, distressed, angry, disgusted by the man's physical appearance and disgusted by the man's behaviour). Please see Table 2 for means and standard deviations of these indices of mental contamination.

A multivariate repeated measures ANCOVA was conducted to assess the effect of the desirability of the kiss, the physicality of the man and their interaction on the dependent variables after controlling for the covariate (e.g., ease to imagine the scenario ratings). Results revealed a trend for an effect of the covariate  $F(3, 137) = 3.57, p = .061, \text{partial } \eta^2 = .03$ ; on the indices of mental contamination. Results also revealed a main effect of desirability of the kiss  $F(1, 132) = 85.28, p < .001, \text{partial } \eta^2 = .39$ ; a main effect of physicality of the man  $F(1, 132) = 77.84, p < .001, \text{partial } \eta^2 = .37$ ; and an interaction between them  $F(1, 132) = 7.87, p < .01, \text{partial } \eta^2 = .06$ , after controlling for the covariate, such that women in the NCPD condition reported the greatest feelings of mental contamination, while women in the CPC condition reported the least.

Results indicated an effect of the covariate  $F(1, 137) = 5.36, p = .02, \text{partial } \eta^2 = .04$ , on feelings of dirtiness. Significant group differences were also revealed  $F(3, 137) = 51.35, p < .001, \text{partial } \eta^2 = .54$ , after controlling for the covariate. We found that participants who imagined a non-consensual kiss from a man described as physically dirty reported significantly greater feelings of dirtiness than those in the other three conditions (all  $p$ 's  $< .001$ ), participants who imagined a consensual kiss from a man described as physically clean reported significantly lower feelings of dirtiness than those in the other three conditions (all  $p$ 's  $< .001$ ), and there was no significant difference between participants who imagined a non-consensual kiss from a man described as physically clean or a consensual kiss from a man described as physically dirty ( $p = .27$ ; see Figure 2 for ratings of feelings of dirtiness in each condition).

There was a trend for an effect of the covariate  $F(1, 137) = 3.17, p = .08, \text{partial } \eta^2 = .023$ , on urges to wash. A similar pattern of significant group differences was also revealed  $F(3,$

137) = 25.78,  $p < .001$ ,  $partial \eta^2 = .37$ , after controlling for the covariate. We also found that participants in the NCPD condition reported the greatest urges to wash relative to the NCPC and CPC conditions (all  $p$ 's  $< .01$ ), but only a trend to report greater urges to wash than those in the CPD condition ( $p = .075$ ). Further, participants in the CPC condition reported the lowest (all  $p$ 's  $< .001$ ) degree of urges to wash than those in the other three conditions. There was also no significant difference between participants in the CPD and NCPC conditions ( $p = .18$ ) in their reported urges to wash.

Findings revealed that there was no effect of the covariate  $F(1, 137) = .03, p = .87$ ,  $partial \eta^2 < .001$ , on INE. However, significant group differences were revealed  $F(3, 137) = 16.00; p < .001; partial \eta^2 = .27$ , after controlling for the covariate. Participants in the CPC condition reported significantly lower INE than participants in the other three conditions (all  $p$ 's  $< .001$ ), participants in the NCPC condition did not differ significantly from the CPD ( $p = .44$ ) or NCPD ( $p = .28$ ) conditions, and there was a trend for participants in the NCPD condition to report significantly greater INE than participants in the CPD ( $p = .077$ ) condition.

There was also no effect of the covariate  $F(1, 137) = .07, p = .79, partial \eta^2 = .001$ , on ENE; and significant group differences were revealed  $F(3, 137) = 70.45, p < .001, partial \eta^2 = .61$ , after controlling for the covariate. Participants in all four conditions differed significantly from each other in descending order from greatest to least: NCPD, NCPC, CPD to CPC (all  $p$ 's  $< .001$ ).

#### *Subsequent washing behaviour*

Participants in the NC conditions ( $n = 6$ ) engaged in washing behaviour during the break at a significantly greater frequency than participants in the C conditions ( $n = 0; X^2(1, 138) = 6.09, p = .014$ ), but there was no significant difference between the PC ( $n = 4$ ) and PD ( $n = 2; X^2(1, 138) = .76, p = .38$ ) conditions. However, results from a binary logistic regression revealed

that participants in the NC (odds ratio  $< .001$ ,  $p > .05$ ), or PD (odds ratio = .26, 95% CI: .04-1.75,  $p = .17$ ), conditions were not significantly more likely to wash than those in the C or PC conditions after accounting for the covariate. There was a trend for participants who found it easier to imagine the scenario to engage in washing behaviour during the break (odds ratio = 1.09, 95% CI: .99-1.20,  $p = .08$ ).

## Discussion

We examined whether mental contamination could be evoked to a greater degree when an imagined situation involved both physical dirt and unwanted sexual contact, and whether feelings of mental contamination could be evoked by imagined physical dirt alone.

### *Replication and expansion of previous findings*

Results that the imagined occurrence of a non-consensual kiss from a man described as physically dirty could evoke mental contamination, and that the imagined occurrence of a consensual kiss from a man described as physically clean did not evoke mental contamination are consistent with predictions made in Rachman's (1994, 2004, 2006) early descriptions of the construct of mental contamination. Results from this study also expand on Rachman's conceptualization in that participants who imagined experiencing either a consensual kiss from a man described as physically dirty, or a non-consensual kiss from a man described as physically clean experienced mental contamination to a similar degree on many dependent variables of interest. Findings suggest that the frequency of washing behaviour in the CPD condition may have been greater if participants had found it as straightforward to imagine the scenario. These findings demonstrate that not only can feelings of mental contamination result from an immoral human source, but that they can also result from an imagined physically dirty stimulus. This lends empirical support to the idea that a distinguishing factor between contact and mental

contamination may be the means by which these fears are triggered (e.g., by physical contact versus by images, memories, thoughts), and not immorality alone.

The results of this study are largely consistent with other ‘dirty kiss’ studies (e.g., Fairbrother, Newth, & Rachman, 2005; Herba & Rachman, 2007) in that an imagined non-consensual kiss evoked feelings of mental contamination to a greater degree than a consensual kiss. Results are inconsistent with findings of Herba & Rachman (2007) given that they found 27% of women who imagined a non-consensual kiss from a man described as physically dirty engaged in washing behaviour whereas only 8.6% of women in our NC conditions did so. The reason for such a discrepancy in percentage of washers is unclear. However, the percentage of washers in our study *is* consistent with the percentage of washers in other studies involving a non-consensual kiss, specifically 8.8% and 11.4% in the non-consensual conditions of Fairbrother, Newth, and Rachman (2005), and Elliott and Radomsky (2009), respectively.

#### *Limitations of this study*

The limitations of this study are similar to those reported in Elliott and Radomsky (2009). There is a possibility of demand characteristics, although a blind design and a control condition (i.e., CPC condition) were implemented. The generalizability of these findings is limited due to the use of a non-clinical sample of young, female, undergraduate students. The imagined event paradigm employed in this study relies on participants’ abilities to imagine and experience the scenario at that moment in the laboratory. Finally, pre-kiss manipulation check ratings were collected following the imagined event.

#### *Research and clinical implications*

Research implications from these findings target paradigms involving manipulations using vignettes, audio clips and video clips. Specifically, these types of paradigms involving physically dirty stimuli may be tapping into the larger construct of mental contamination rather

than basic emotions such as fear and disgust; two emotions implicated in contamination fears. Research using such paradigms may benefit from the inclusion of measures of variables such as state anxiety, state disgust, feelings of dirtiness and urges to wash to ensure that researchers are evoking the construct of interest, and not neglecting to measure mental contamination.

Clinical implications from these findings involve highlighting the role of cognitions in fears of contamination, and in particular, mental contamination. We found that the mere thought of a contaminant (i.e., CPD condition), in the absence of direct physical contact with that contaminant and issues of immorality, is sufficient to evoke fears of mental contamination. These results suggest that the assessment and treatment of fears of contamination should be tailored to identify and target mental contamination-related thoughts, images, memories, etc. Exposure to physically dirty stimuli may be insufficient if an individual is also suffering from the mentally contaminating effects of certain thoughts and images. An individual's fear may persist if they are generating thoughts and images which increase the degree of perceived contamination of the physical stimuli and in turn increase the level of perceived danger. In addition, experiences of humiliation and/or betrayal could be assessed for and the personal significance of certain appraisals and interpretations. Behavioural experiments could then be employed to target identified appraisals and interpretations by testing and evaluating specific predictions (Radomsky & Elliott, 2009). Fortunately, a number of cognitively-based treatments for OCD have been established (see Clark, 2004; Rachman, 1997; 1998; Radomsky, Shafran, Coughtrey & Rachman, 2010; and Wilhelm & Steketee, 2006).

### *Conclusions*

In sum, the findings from this study provide further empirical support for, and expand on Rachman's (1994, 2004, 2006) conceptualization of mental contamination, and address potential limitations of previous research. In particular, an imagined immoral act conducted by an immoral

person (recall that the man is deemed immoral once the immoral act is committed (Elliott & Radomsky, 2009)), who is also described as physically dirty evoked mental contamination to a greater degree than when the man was described as physically clean or the kiss was described as consensual. In addition, findings from this study demonstrate that imagined physical contact with a physically dirty stimulus (e.g., the man) can evoke mental contamination.

Future mental contamination research would benefit from examining other negative events which do not involve physical contact (imagined or not), such as betrayal, and other types of “dirty” stimuli. The descriptions of dirt in this study primarily involved practices of being unhygienic. It would be interesting to examine conceptual situations for which a more immediate threat of contracting an illness is present. Future research in this area would have important clinical implications in terms of improving both assessment and treatment of fears of contamination by identifying factors which might put individuals at greater (or reduced) risk to experience mental contamination.



## References

- Beck, J., & Steer, R.A. (1990). *Beck Anxiety Inventory manual*. San Antonio, TX: Psychological Corporation.
- Beck, A.T., Steer, R.A., & Brown, G.K. (1996). *Manual for the Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation.
- Clark, D.A. (2004). *Cognitive-Behavioral Therapy for OCD*. NY: Guildford Press.
- Coughtrey, A., Shafran, R., Lee, M., & Rachman, S.J. (2012). It's the feeling inside my head: A qualitative analysis of mental contamination in obsessive-compulsive disorder. *Behavioural and Cognitive Psychotherapy, 40*, 163-173.
- Elliott, C.M., & Radomsky, A.S. (2009). Analyses of mental contamination: Part I, experimental manipulations of morality. *Behaviour Research and Therapy, 47*, 995-1003.
- Fairbrother, N., & Rachman, S. (2004). Feelings of mental pollution subsequent to sexual assault. *Behaviour Research and Therapy, 42*, 173-189.
- Fairbrother, N., Newth, S., & Rachman, S. (2005). Mental pollution: Feelings of dirtiness without physical contact. *Behaviour Research and Therapy, 43*, 121-130.
- Gershuny, B.S., Baer, L., Radomsky, A.S., Wilson, K.A., & Jenike, M.A. (2003). Connections among symptoms of obsessive-compulsive disorder and posttraumatic stress disorder: a case series. *Behaviour Research and Therapy, 41*, 1029-1041.
- Herba, J.K., & Rachman, S. (2007). Vulnerability to mental contamination. *Behaviour Research and Therapy, 45*, 2804-2812.
- Kinsey, A.C., Pomeroy, W.B., & Martin, C.E. (1948). *Sexual Behaviour in the Human Male*. Philadelphia, PA: WB Saunders.
- Rachman, S.J. (1994). Pollution of the mind. *Behaviour Research and Therapy, 32*, 311-314.

- Rachman, S.J. (1997). A cognitive theory of obsessions. *Behaviour Research and Therapy*, *35*, 793-802.
- Rachman, S.J. (1998). A cognitive theory of obsessions: Elaborations. *Behaviour Research and Therapy*, *36*, 385-401.
- Rachman, S.J. (2004). Fear of contamination. *Behaviour Research and Therapy*, *42*, 1227-55.
- Rachman, S.J. (2006). *The Fear of Contamination: Assessment and Treatment (Cognitive Behaviour Therapy: Science & Practice S.)*. Oxford: Oxford University Press.
- Rachman, S.J. (2010). Betrayal: A psychological analysis. *Behaviour Research and Therapy*, *48*, 304-311.
- Rachman, S.J., Radomsky, A.S., Elliott, C.M., Shafran, R., & Coughtrey, A. (2010, June). *Cognitive-behaviour therapy for contamination-related OCD: ERP and beyond*. Workshop at the World Congress of Behavioral and Cognitive Therapies conference, Boston, MA.
- Rachman, S.J., Radomsky, A.S., Elliott, C.M., & Zysk, E. (2011). Mental contamination: The perpetrator effect. *Journal of Behavior Therapy and Experimental Psychiatry*, *43*, 587-593.
- Radomsky, A.S., & Elliott, C.M. (2009). Analyses of mental contamination: Part II, individual differences. *Behaviour Research and Therapy*, *47*, 1004-1011.
- Radomsky, A.S., Shafran, R., Coughtrey, A.E., & Rachman, S. (2010). Cognitive-behavior therapy for compulsive checking in OCD. *Cognitive and Behavioral Practice*, *17*, 119-131.
- Thordarson, D.S., Radomsky, A.S., Rachman, S., Shafran, R., Sawchuk, C.N., & Hakstian, A.R. (2004). The Vancouver Obsessional Compulsive Inventory (VOCI). *Behaviour Research & Therapy*, *42*, 1289-1314.
- Wilhelm, S., & Steketee, G.S. (2006). *Cognitive therapy for obsessive-compulsive disorder: A guide for professionals*. Oakland, CA: New Harbinger.

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Table 1

*Mean Scores and Standard Deviations on Demographic and Baseline Ratings, Questionnaire Scores and Ease to Imagine Scenario Ratings for each Condition*

Variable	Condition							
	CPC		CPD		NCPC		NCPD	
	M	SD	M	SD	M	SD	M	SD
Age	24.12 <sup>a</sup>	7.59	22.6 <sup>a</sup>	4.19	22.57 <sup>a</sup>	4.23	21.54 <sup>a</sup>	4.44
Baseline Anxiety	20.91 <sup>a</sup>	28.95	19.66 <sup>a</sup>	22.10	20.83 <sup>a</sup>	25.52	27.3 <sup>a</sup>	28.41
Baseline Disgust	4.24 <sup>a</sup>	14.85	2.71 <sup>a</sup>	7.00	1.37 <sup>a</sup>	4.43	1.54 <sup>a</sup>	4.31
Baseline Dirtiness	10.52 <sup>a</sup>	16.23	10.43 <sup>a</sup>	13.52	7.46 <sup>a</sup>	12.57	6.69 <sup>a</sup>	11.49
Ease to Imagine Scenario	78.89 <sup>ab+</sup>	14.80	71.73 <sup>b+</sup>	20.58	78.12 <sup>a</sup>	15.00	86.55 <sup>c</sup>	11.06
BDI-II	9.12 <sup>a</sup>	7.80	9.40 <sup>a</sup>	6.83	9.86 <sup>a</sup>	6.95	9.71 <sup>a</sup>	7.62
BAI	10.12 <sup>a</sup>	9.48	13.40 <sup>a</sup>	9.63	12.34 <sup>a</sup>	8.29	12.00 <sup>a</sup>	8.64
VOCI-CTN	4.33 <sup>a</sup>	5.45	5.60 <sup>a</sup>	6.30	8.09 <sup>a</sup>	7.52	7.60 <sup>a</sup>	7.85

<sup>+</sup> $p = .06$ . CPC = Consensual Physically Clean condition. CPD = Consensual Physically Dirty condition. NCPC = Non-consensual Physically Clean condition. NCPD = Non-consensual Physically Dirty condition. Baseline and Ease to Imagine Scenario ratings are based on ratings from 0 (“not at all”) to 100 (“completely”). BDI-II = Beck Depression Inventory-2; items from 0 to 3 (indicating the degree of each symptom if present). BAI = Beck Anxiety Inventory; items from 0 (“not at all”) to 3 (“severely, I could barely stand it”). VOCI-CTN = Contact Contamination Subscale of the Vancouver Obsessional Compulsive Inventory; items from 0

(“not at all”) to 4 (“very much”). For each row, values which share the same superscript are not significantly different from each other at the  $p < .05$  level.

Table 2

*Mean Scores and Standard Deviations on Manipulation Checks Ratings and Indices of Mental Contamination for each Condition*

Variable	Condition							
	CPC		CPD		NCPC		NCPD	
	M	SD	M	SD	M	SD	M	SD
Kiss Desirability	64.01 <sup>a</sup>	28.38	54.43 <sup>a</sup>	33.60	25.11 <sup>b</sup>	24.73	9.46 <sup>c</sup>	20.98
Man Dirty Before	3.64 <sup>a</sup>	6.65	36.29 <sup>b</sup>	32.86	8.69 <sup>a</sup>	13.69	50.40 <sup>c</sup>	27.44
Man Dirty After	8.33 <sup>a</sup>	16.33	77.40 <sup>b</sup>	21.47	57.86 <sup>c</sup>	30.31	92.46 <sup>d</sup>	8.95
Feelings of Dirtiness	4.27 <sup>a</sup>	8.92	48.37 <sup>b</sup>	34.39	44.06 <sup>b</sup>	26.13	76.57 <sup>c</sup>	17.10
Urges to Wash	1.76 <sup>a</sup>	6.85	42.21 <sup>b</sup>	34.78	35.25 <sup>b</sup>	28.30	58.25 <sup>c</sup>	27.55
Internal Negative Emotions	6.26 <sup>a</sup>	12.44	30.31 <sup>b+</sup>	24.94	34.43 <sup>b</sup>	24.18	40.30 <sup>b+</sup>	21.49
External Negative Emotions	5.33 <sup>a</sup>	9.86	33.60 <sup>b</sup>	23.03	53.41 <sup>c</sup>	20.99	72.44 <sup>d</sup>	20.77

+ $p = .054$ . CPC = Consensual Physically Clean condition. CPD = Consensual Physically Dirty condition. NCPC = Non-consensual Physically Clean condition. NCPD = Non-consensual Physically Dirty condition. Variable scores are based on ratings from 0 (“not at all”) to 100 (“completely”). For each row, values which share the same superscript are not significantly different from each other at the  $p < .05$  level.

Figure Captions

*Figure 1.* Ratings of perceptions of physical dirtiness of the man after controlling for ease to imagine the scenario scores.

*Figure 2.* Ratings of feelings of dirtiness after controlling for ease to imagine the scenario scores.





