Violations of the self and mental contamination: A multimethod investigation

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ABSTRACT

Violations of the self and mental contamination: A multimethod investigation

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Mental contamination refers to contamination-related symptoms, common in obsessive-compulsive disorder (OCD) and in survivors of sexual trauma, that arise in the absence of direct contact with a physical contaminant. Cognitive models of mental contamination highlight the central role of perceptions of violation in the onset and maintenance of these feelings. That said, little research has been conducted to operationally define the construct of violation and systematically examine its different manifestations. Maladaptive appraisals of the self have been identified as maintaining factors in cognitive models of both posttraumatic stress disorder (PTSD) and obsessive-compulsive disorder (OCD). Thus, perceptions of violation of one's self-concept may represent an aspect of violation appraisal relevant to the experience of mental contamination. The aim of the proposed program of research was to expand upon key components of this model using a multimethod approach. Study 1 involved a qualitative analysis of the experience of violation in a sample of 20 participants with OCD and/or trauma histories. Three overarching categories emerged from the interviews, each with several themes and sub-themes – *qualities of violation, violation-related appraisals,* and *violation-related behaviour.* Specific self-focused appraisal sub-themes (i.e., permanence of consequences; self-worth; and responsibility, self-blame, and regret) were most closely related to emotions tied to mental contamination. Following from the results from Study 1, Study 2 comprised the development and validation of a novel self-report questionnaire of violation appraisals, the Violation Appraisal Measure (VAM). Results from validation in an undergraduate sample (N = 300) suggested a four-factor structure for the VAM, which was confirmed in a second undergraduate sample (N = 300) and sound psychometric properties were demonstrated. Study 3 consisted of an experimental manipulation of perceptions of moral self-violation in a sample of undergraduate students (N = 150). Overall, self-violation, as compared to self-bolstering and a negative mood induction, led to heightened mental contamination feelings, but not heightened urges to wash. Theoretical and clinical implications of these findings are discussed.

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Contribution of Authors

The following thesis is comprised of three manuscripts:

Study 1 (Chapter 2)

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Study 2 (Chapter 4)

Krause, S. & Radomsky, A.S. (2024a). Development and psychometric evaluation of the Violation Appraisal Measure (VAM). *Cognitive Behaviour Therapy,* 115-136. https://doi.org/10.1080/16506073.2024.2395823

Study 3 (Chapter 6)

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I was responsible for selecting and conceptualizing this program of research. I had regular meetings to consult with Dr. Adam S. Radomsky about the development of these studies, the writing of this document and the writing of each of the manuscripts included below. Drs. Roisin O'Connor and Andrew Ryder approved the methodological and statistical plan at my proposal meeting on April 19, 2021.

For Study 1, I was responsible for the conceptualization, design, and execution of the project. I was responsible for all aspects of data collection – recruiting participants, conducting eligibility assessments, diagnostic assessments, and qualitative interviews. I was the primary coder for all qualitative data, consulting with Drs. Radomsky and Ken Kelly-Turner throughout the coding process for coding reliability checks and to reach consensus on key constructs. I wrote the manuscript, incorporated Dr. Radomsky's edits and feedback, and was responsible for incorporating reviewers' feedback after submission. The manuscript was ultimately selected as *Behavioural and Cognitive Psychotherapy's* Article of the Month (May 2024). As part of this recognition, I was responsible for writing a science communication blog post about the findings from this Study and giving an interview for the Journal's podcast.

I was responsible for conceptualizing and implementing Study 2. I generated a pool of candidate items based on existing theoretical models and the results of Study 1. I consulted with Dr. Radomsky and members of the Anxiety and Obsessive-Compulsive Disorder Laboratory to settle on the final pool of items. I was responsible for survey programming on Qualtrics, data cleaning, all statistical analyses, and interpreting results. I consulted with the laboratory to confirm the final scale items and subscale names. I wrote all components of the manuscript before sending it to Dr. Radomsky for feedback. I prepared the manuscript for publication and was responsible for incorporating reviewers' comments. Dr. Radomsky supervised and provided feedback on all these steps.

I was responsible for conceptualizing, designing, and implementing Study 3 in collaboration with Dr. Radomsky. I wrote the protocol, designed the manipulation, and programmed the study in Qualtrics. I was responsible for data cleaning and conducted all statistical analyses. I interpreted the data and wrote all components of the manuscript. Dr. Radomsky provided feedback on the manuscript. I prepared the manuscript for publication and was responsible for incorporating reviewer comments. Dr. Radomsky supervised and provided feedback on all these steps.

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CHAPTER 1: General Introduction

Feelings of dirtiness and washing behaviour have traditionally been thought of as a response to physically disgusting stimuli such as dirt or germs. Indeed, most people can relate to the feeling of contamination and urges to wash that might arise after contact with an unidentified sticky substance on a door handle or a wet spot in a public bathroom. However, there is also a moral component of contamination and disgust that is not captured by traditional definitions of physical contamination. While contamination triggered by moral impropriety is a relatively newer construct in the domain of clinical research (Fairbrother & Rachman, 2004; Rachman, 2004), it has long been captured in literature, philosophy, and popular culture. Whether arising from Lady McBeth's incessant attempts to cleanse herself after conspiring to commit murder, or newspaper headlines referring to perpetrators like Harvey Weinstein or Jeffrey Epstein as "filthy" or "disgusting", it is clear that dirtiness is associated with more than just physically disgusting objects. A growing body of clinical research has aimed to understand these feelings of internal dirtiness that arise without contact with a physical contaminant, termed mental contamination (Rachman, 2004; Rachman, Coughtrey, Shafran, & Radomsky, 2015). Despite greater acknowledgement of these experiences in recent research, several gaps in our understanding of the cognitive mechanisms that drive these feelings remain.

Initially, the construct of mental contamination was demonstrated empirically in survivors of sexual trauma, who reported feeling dirty and engaging in washing behaviour when they were prompted to recall their assault (Fairbrother & Rachman, 2004). Since then, a large body of work has expanded on these findings by showing the relevance of mental contamination concerns to obsessive-compulsive disorder (OCD) as well (e.g., Coughtrey, Shafran, Knibbs, & Rachman, 2012; Elliot & Radomsky, 2009; Rachman, 2004; Rachman et al., 2015). Within clinical samples, researchers have found that approximately 44% of individuals with OCD and 80% of survivors of sexual assault report clinically significant levels of mental contamination (Brake, Tipsword, & Badour, 2021; Coughtrey, Shafran, Knibbs, et al., 2012). Yet, despite its prevalence, mental contamination remains relatively underrepresented in clinical research in these populations and is therefore less well understood than other clinical phenomena.

A comprehensive cognitive model was proposed to explain the experience of mental contamination (Rachman et al., 2015), emphasizing the importance of particular types of appraisals to this phenomenon (e.g., appraising oneself as worthless, pathetic, weak, or

insignificant). However, due to the relative dearth of empirical research on mental contamination at the time of its development, several aspects of this model could benefit from elaboration and empirical validation. Therefore, the goal of the current program of research was to expand upon this model by elaborating on key constructs qualitatively, psychometrically, and experimentally.

Phenomenology of Mental Contamination in OCD & Trauma

Most research on mental contamination to date has been conducted in the context of OCD and in survivors of sexual trauma. While these populations are distinct in many ways, the phenomenology of mental contamination appears to be the same regardless of diagnostic profile (Ojalehto & Abramowitz, 2023). In both clinical populations, feelings of mental contamination have been described as internal and diffuse and are typically accompanied by other negative emotions like guilt, shame, anxiety, and disgust (Coughtrey, Shafran, Lee, & Rachman, 2012; Jung & Steil, 2013; Rachman, 2004).

The triggers for mental contamination are highly idiosyncratic. However, they all tend to share a common theme of immorality or impurity (Rachman, 2004). Within OCD, feelings of mental contamination often arise in response to intrusive repugnant obsessions (e.g., intrusive thoughts about incest or pedophilia; Rachman et al., 2015) (e.g., intrusive thoughts about incest or pedophilia) or in response to instances of perceived betrayal, humiliation, or degradation (e.g., bullying; Zysk, Shafran, & Williams, 2018). Alternatively, mental contamination can also arise in response to others' immoral behaviour, whereby an individual feels contaminated by proximity to someone else's undesirable qualities (Rachman, 2004). Within the context of trauma, particularly for those who have experienced sexual trauma, these feelings tend to be prompted by intrusive memories of the trauma itself or by contact with, or reminders of, the perpetrator of the trauma (Rachman, 2004; Rachman et al., 2015).

For many individuals without OCD and/or trauma histories, the feelings of dirtiness that might arise from moral "contaminants" are typically transient and result in a manageable level of discomfort or distress (Radomsky et al., 2018). However, in clinical populations, these feelings are persistent, recurrent and result in extreme distress. Further, those with clinical levels of mental contamination typically feel compelled to engage in some kind of behaviour (e.g., washing, thought suppression) to neutralize or avoid these feelings. Because these moral

"contaminants" do not leave an identifiable site of contamination, the feelings that arise tend to be experienced as a non-localized, whole body feeling (Fairbrother & Rachman, 2004). As a result, washing tends to be ineffective at providing relief (Rachman et al., 2015) and may actually cause these feelings to persist (Coughtrey, Shafran, & Rachman, 2014). This contributes to the cycle of excessive, interfering, and sometimes harmful, washing rituals individuals feel compelled to engage in (Coughtrey, Shafran, Lee, et al., 2012).

Cognitive Model of Mental Contamination

Like many psychopathological phenomena, experiences of mental contamination exist on a continuum. Indeed, some degree of physical and mental contamination fear is normative and, in fact, healthy as it protects us from potential pathogens and alerts us to the violation of social and moral norms (Rozin, Haidt, & Fincher, 2009). Cognitive models propose that what differentiates adaptive transient experiences of mental contamination from clinical experiences may be the meaning people attach to the contamination triggers. Many people experience violations like repugnant intrusive thoughts (Radomsky, Alcolado, et al., 2014) and/or sexual trauma and do not go on to experience distressing levels of mental contamination. Therefore, it does not appear to be the presence or absence of violations that causes feelings of mental contamination. Rather, cognitive models propose that what differentiates these outcomes is the way in which an individual interprets these violating events (Rachman et al., 2015).

Specifically, cognitive models of mental contamination suggest that these feelings arise when an individual makes a serious negative misappraisal of a violation (Rachman et al., 2015). The theory proposes that misappraising violating events like sexual assault, betrayal, or degradation as personally significant compromises individuals' sense of self and leads to feelings of dirtiness and urges to wash. For example, appraising intrusive thoughts about pedophilia or intrusive memories of sexual assault as an indication that one is irreparably damaged leads one to feel tainted, blemished, and dirty and engage in behaviour to "cleanse" oneself.

This model of mental contamination has been foundational in understanding and treating these symptoms. However, it was largely developed using existing theoretical models of OCD (e.g., Rachman, 1997, 1998), clinical reports (de Silva & Marks, 1999; Gershuny, Baer, Radomsky, Wilson, & Jenike, 2003), and a relatively small body of experimental research (e.g., Coughtrey et al., 2014; Elliot & Radomsky, 2009; Fairbrother, Newth, & Rachman, 2005;

Fairbrother & Rachman, 2004). For that reason, aspects of the model could benefit from elaboration and further empirical evaluation. Specifically, the model emphasizes the central role of "serious negative misinterpretations of violations" in driving these symptoms. However, research clarifying what specific types of violation appraisals uniquely relate to these feelings, as compared to other violation-related emotional and behavioural sequelae is limited.

Violation Appraisals

Based on a series of case histories, Rachman et al. (2015) initially proposed examples of specific types of misinterpretations of personal significance that may be particularly relevant to mental contamination. These included the misinterpretation that one is viewed as worthless, pathetic, weak, or insignificant by others. While rooted in real world clinical experience, few studies have explicitly tested the causal role of these specific misinterpretations on mental contamination. Experiments examining the impact of different situational factors on these feelings provide some clues about potential cognitive mechanisms. Specifically, studies have found that mental contamination is elevated when a perpetrator of a violation is perceived as immoral (Elliot & Radomsky, 2009) and physically dirty (Elliot & Radomsky, 2012), and when a violation is interpreted as a betrayal (Nielsen, Bream, & Salkovskis, 2024; Pagdin, Salkovskis, Nathwani, Wilkinson-Tough, & Warnock-Parkes, 2020).

The manipulation of these variables external to the participant allows for inferences about possible appraisals driving these effects. However, the cognitive model proposes that the appraisals most relevant to mental contamination are appraisals about the self rather than appraisals about a perpetrator of a violation. Thus, it may be more clinically relevant to understand the appraisals individuals make about themselves as a result of these perpetrator- or violation-related factors. For example, identifying how an individual appraises themselves after interacting with an immoral person or experiencing a betrayal (e.g., "I am tainted", "I am bad", "I am worthless") may better explain the relationship between exposure to violating events and subsequent feelings of mental contamination than appraisals of the immoral person or betrayal itself. Indeed, this aligns with recent research that found that only negative appraisals of the self – not negative beliefs about others or the world – prospectively predicted increases in mental contamination among sexual assault survivors (Tipsword, McCann, Flores, Brake, & Badour, 2024).

Rationale and Current Program of Research

To intervene on mental contamination symptoms most effectively, key areas of the cognitive model could benefit from further examination and clarification. First, despite its centrality to the model, a clear unifying definition of the construct of violation is lacking. While examples are provided of different types of violations (e.g., degradation, betrayal, sexual assault), it is not clear what qualities tie these experiences together. Further, the cognitive mechanisms proposed to drive the relationship between violating events and subsequent feelings of mental contamination were developed in a top-down manner based on existing theoretical models of OCD and anxiety disorders (e.g., D. M. Clark, 1986; Rachman, 1997, 1998) and a non-systematic integration of case histories. Therefore, examining the phenomenon of mental contamination in a bottom-up systematic manner would help to validate the model proposed by Rachman et al. (2015) and to clarify key appraisals.

The literature empirically evaluating the impact of different violation appraisals on mental contamination is also limited by the absence of measures of these types of appraisals. Several measures have been developed to assess the presence of appraisals and beliefs relevant to OCD and PTSD symptoms more broadly, such as the Obsessive Beliefs Questionnaire (Obsessive Compulsive Cognitions Working Group, 2005) and the Posttraumatic Cognitions Inventory (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999). However, these measures are more diagnostically specialized and do not capture the types of violation-related appraisals that are proposed to be most relevant to mental contamination. Within the context of mental contamination, specifically, Pagdin et al. (2020) developed the Perceptions of Betrayal Scale to measure the degree to which individuals are affected by past instances of betrayal. While this measure was found to moderately predict mental contamination symptoms, the items are specific to instances of betrayal. Betrayal is indeed one form of violation identified in the cognitive model. However, experimental work has shown that betrayal alone does not seem to be sufficient to provoke mental contamination (Millar, Salkovskis, & Brown, 2016). Further, many of the items on this measure capture the emotional and behavioural consequences of betrayal more so than specific appraisals of the betrayal itself (e.g., “When I am reminded of past betrayals I feel the need to do something in response”, “When I think of past betrayals I feel distressed”). Therefore, a comprehensive measure of appraisals specifically, is lacking. A measure of this kind

would help researchers tease apart the relative influence of different types of appraisals on the experience of mental contamination and identify what types of appraisals might be especially relevant to different violation-related emotional and behavioural sequelae.

Finally, while there have been many experiments done on mental contamination (e.g., Elliot & Radomsky, 2009; Fairbrother et al., 2005; Krause & Radomsky, 2021; Millar et al., 2016; Rachman, Radomsky, Elliot, & Zysk, 2012), very few have directly manipulated cognitive mechanisms related to the self. Instead, most existing experiments have made inferences about cognitive mechanisms based on the manipulation of situational factors in the imagined scenarios. As previously mentioned, the cognitive model proposes that negative self-appraisals following a violation (e.g., I am worthless, weak, insignificant) are key to understanding this phenomenon. Yet, experimental studies directly manipulating these appraisals are lacking, and those that have been conducted have had important methodological limitations (e.g., Kennedy & Simonds, 2017; Krause & Radomsky, 2021). A recent longitudinal study found an association between negative beliefs about the self and subsequent feelings of mental contamination in a sample of female sexual assault survivors (Tipsword et al., 2024). However, for clinical utility it is not just helpful to know that these appraisals are predictive of later contamination, but that they are causally linked. Therefore, it would be beneficial to experimentally examine the impact of directly manipulating these appraisals on mental contamination.

To address these gaps, a series of three multimethod studies was conducted. Each of these studies is described below. First, a qualitative study was conducted with individuals with OCD and/or trauma histories to develop a clear definition of violation and identify various types of appraisals associated with different violation-related emotional sequelae in a systematic, bottom-up manner (Krause & Radomsky, 2024b). Then, findings from this study were used to develop and validate a comprehensive quantitative measure of violation appraisals (Krause & Radomsky, 2024a). Finally, this program of research includes an experiment wherein self-focused violation appraisals were manipulated to examine their causal impact on mental contamination-related symptomatology (Krause & Radomsky, 2023).

CHAPTER 2: "Things that shouldn't be": A qualitative investigation of violation-related appraisals in individuals with OCD and/or trauma histories

Violating intrusive thoughts, images, and memories are central to both obsessive-compulsive disorder (OCD) and posttraumatic stress disorder (PTSD). In PTSD, individuals experience intrusive memories about past trauma (e.g., flashbacks) while in OCD, individuals can experience repugnant intrusive thoughts (e.g., thoughts about incest or pedophilia). These mental violations can lead to a range of negative emotions (e.g., fear, shame, anger). A recently acknowledged, yet lesser understood consequence of these violations is mental contamination (Rachman, 2004). Mental contamination is defined as feelings of internal dirtiness and/or washing behaviour that arise without direct contact with a physical contaminant (Rachman et al., 2015). Cognitive models of mental contamination suggest that these symptoms arise from specific appraisals of violating events. However, a clear definition of what constitutes a "violation" is limited and little research has been done to identify the kinds of violation-related appraisals that may lead to these symptoms. Therefore, the goal of this study was to elaborate on existing theoretical models to understand the experience of violation more thoroughly in individuals with OCD and/or histories of trauma.

Mental contamination is prevalent and has a serious impact on individuals' lives; indeed, approximately 44% of individuals with OCD report clinically significant levels of mental contamination (Coughtrey, Shafran, Knibbs, et al., 2012) and over 83% of a sample of women with sexual trauma histories reported at least moderate levels of mental contamination (Brake et al., 2021). Mental contamination symptomatology also appears to be predictive of more severe symptoms of both OCD and PTSD (Badour et al., 2023). Finally, symptoms of mental contamination appear to be less responsive to exposure and response prevention (ERP) interventions, with higher pre-ERP levels of mental contamination predictive of higher post-treatment contamination-related symptomatology (Mathes, McDermott, et al., 2019). Theorists propose that this may be due to the cognitive nature of mental contamination, which may require more targeted cognitive interventions than contact contamination concerns (Coughtrey, Shafran, Lee, & Rachman, 2013; Rachman et al., 2015; Radomsky, Rachman, Shafran, Coughtrey, & Barber, 2014).

Cognitive models highlight the central role of beliefs and appraisals in the onset and maintenance of OCD and PTSD (Ehlers & Clark, 2000; Rachman, 1997, 1998; Resick, Monson,

& Chard, 2016; Salkovskis, 1985). Within OCD, the appraisal of intrusive thoughts as an indication that one is "mad, bad, or dangerous" is proposed to be a key mechanism (Rachman, 1997, 1998). Similarly, Ehlers and Clark (2000) propose that PTSD symptoms result from appraisals of trauma cues as an indication of current threat (e.g., "I am in danger") or of lasting changes to one's self-concept (e.g., "I am tainted"). For symptoms of mental contamination, specifically, appraisals relating to violation seem to be particularly relevant (Rachman et al., 2015). However, less is known about the specific violation-related appraisals at play in mental contamination due to its relative underrepresentation in clinical research in OCD and PTSD. Experimental research on the situational factors that contribute to feelings of mental contamination provides some clues about potential cognitive mechanisms. Namely, the moral character of a perpetrator of a violation (Elliot & Radomsky, 2009); degree of, or proximity to, a violation (Elliot & Radomsky, 2009; Krause & Radomsky, 2021; Radomsky & Elliot, 2009); physical dirtiness of a perpetrator (Elliot & Radomsky, 2012); and pre-task levels of disgust (Fong & Sündermann, 2020) have all been shown to heighten reported levels of internal dirtiness. Taken together, these findings suggest that appraisals related to betrayal, the violation of one's moral code, and crossing one's physical boundaries might be important for understanding mental contamination.

Not only do violations take many different forms, but the emotional sequelae of violation are also varied. Along with feelings of dirtiness, this also includes feelings of shame, guilt, anger, contempt, fear, and disgust (e.g., Rozin, Lowery, Imada, & Haidt, 1999). Cognitive theory suggests that the way in which an individual appraises a violation will dictate which of these emotions they will experience in response to the violation (e.g., anger: "You intentionally wronged me" vs. disgust: "You wronged society" vs. contamination: "I could become 'infected' by your wrongdoing"). Therefore, not only is it important to identify violation-related appraisals that are relevant to mental contamination, but also to distinguish between the types of appraisals that lead to feelings of contamination from those leading to other negative emotional experiences.

While our understanding of mental contamination has developed substantially, there remains a lack of clear operational definitions for key concepts (e.g., "violation"). Additionally, while ERP is currently the gold standard treatment for OCD, symptoms of mental contamination appear to be less responsive to these interventions than contact contamination concerns and may

require more targeted cognitive interventions (Coughtrey et al., 2013; Mathes, McDermott, et al., 2019). Therefore, theoretical models of, and clinical interventions for mental contamination could be enhanced by identifying specific types of violation appraisals that lead to mental contamination in a systematic, inductive manner. Finally, distinguishing between the types of appraisals associated with feelings of contamination and other negative violation-related emotions would allow for greater nuance in our understanding of violation-related psychological sequelae. We aimed to address these gaps by exploring the meaning of violation in individuals with OCD and trauma histories and identifying their thoughts, emotions, and behaviours from past experiences of violation with semi-structured qualitative interviews. Specifically, we aimed to elaborate theoretical models of mental contamination inductively, grounded in the lived experience of those with OCD and/or trauma histories.

Methods

Design & Researcher Characteristics

The semi-structured interview was initially developed in line with the study goals (i.e., to explore participants' definitions of the construct of "violation", qualities that make events feel violating, and the cognitive, behavioural, and emotional correlates of past experiences of violation). The interview was semi-structured, consisting of a combination of open-ended questions and follow-ups as needed. The interview was piloted in an analogue sample to refine questions, and ensure acceptability, clarity, and focus on study aims.

Given the study's goal of taking an inductive approach to the development of theory around violation, grounded in the lived experience of those with OCD and/or trauma histories, a grounded theory approach was used (Corbin & Strauss, 1990). As such, data analysis was conducted in an iterative manner, with insights from early interviews contributing to more focused interview prompts in subsequent interviews.

All interviews were conducted by SK who identifies as a straight woman. She is a clinical psychology PhD candidate with experience assessing and treating individuals with OCD and trauma histories from a cognitive-behavioural orientation. She had no relationship with study participants prior to their participation in the current study. Her credentials were shared with participants prior to the interview.

Other members of the research team for this study included AR, SK's academic supervisor and a clinical psychologist with extensive expertise in the study and treatment of

mental contamination and OCD more broadly, along with other anxiety-related problems who identifies as a gay man. Finally, KKT is a male Clinical Psychology PhD candidate with clinical and research experience in OCD and qualitative methods.

Participants

Participants (N =20) met criteria for a diagnosis of OCD and/or had experienced a traumatic event that satisfied the DSM-5's Criterion A of PTSD (i.e., an event that included actual or threatened death, serious injury, or sexual violence). Inclusion criteria required participants to be at least 18 years of age, located in Canada, fluent in English, and have access to a computer with Zoom capability. Exclusion criteria included acute substance use and/or a diagnosis of a psychotic disorder. Diagnostic inclusion/exclusion criteria were established using the Mini International Neuropsychiatric Interview (MINI) (Sheehan et al., 1998).

Of the 26 individuals who expressed interest in participation, 6 were deemed ineligible – two did not meet the diagnostic threshold for OCD, and four did not satisfy Criterion A of PTSD. Of the final sample, 3 had an OCD diagnosis only, 7 had a trauma history only, and 10 had both, and there was a mean subclinical level of mental contamination symptoms (M = 29.60; see Table 1 for demographics).

Measures

Semi-Structured Violation Interview

The interview guide was developed by SK, in consultation with other clinicians and researchers with expertise in OCD and trauma. Interview prompts were guided by experiences reported by clients of the research team with symptoms of mental contamination and by theoretical models of mental contamination. The interview was designed to capture participants' definitions of "violation" (e.g., "What does 'violation' mean to you?"), qualities that make 'violations' feel violating (e.g., "I'd like you to think of a past violation. What is it about that instance that made it feel violating?"), and the cognitive, behavioural, and emotional correlates of violating events (e.g., "During that instance, what was going through your mind? What did you do? How did you feel?"). The interview was semi-structured, consisting of both open-ended questions and follow-ups as needed. The interview was pilot tested in an analogue sample to ensure its clarity, acceptability, and focus. See Appendix A for the Semi-Structured Interview Guide.

Mini International Neuropsychiatric Interview, 7th Edition (MINI; Sheehan et al., 1998)

The MINI is a structured diagnostic interview that assesses for the presence of mental disorders based on DSM-5 criteria. The MINI has excellent convergent validity, and interrater reliability (Sheehan et al., 1998).

Vancouver Obsessional-Compulsive Inventory – Mental Contamination Scale (VOCI-MC; Radomsky et al., 2014)

The VOCI-MC is a 20-item measure of mental contamination. The VOCI-MC is a valid and reliable measure (Radomsky et al., 2014) and had excellent internal consistency in the current sample (α = .96).

Procedure

The study was approved by the Concordia University Human Research Ethics Committee (#30013995), which applies research ethics principles that are consistent with the Declaration of Helsinki and was pre-registered on Open Science Framework (https://doi.org/10.17605/OSF.IO/ZYSDF).

Interested individuals who saw study ads online and/or via the Anxiety and OCD Laboratory's clinical registry were invited to contact the research team. A screening call was then conducted to confirm their interest and their demographic and diagnostic eligibility via the OCD and PTSD sections of the MINI (Sheehan et al., 1998). Eligible participants were then scheduled for an interview appointment.

At their interview, the interviewer (SK) ensured that participants were given full study details (i.e., that participants would be asked to recall and provide information about an experience of violation) prior to providing informed consent. Participants were informed that they could share as much or as little detail as they wanted and could end the interview without penalty at any point. SK was trained in relaxation interventions in case participants became acutely distressed while participating. However, this situation did not arise.

Participants were first invited to complete the full MINI (Sheehan et al., 1998) followed by the semi-structured violation interview. Finally, participants were thoroughly debriefed and provided with a list of community mental health resources. They were compensated $50 for participation.

Analysis

The study was conceptualized and is reported in accordance with Consolidated Criteria for Reporting Qualitative Research (COREQ; Tong, Sainsbury, & Craig, 2007). Qualitative

interviews (19-50 minutes, *M* = 33 minutes) were conducted via Zoom. Interviews were audio-recorded, transcribed verbatim, anonymized, and quality checked to ensure accuracy. Data were collected until saturation of key concepts was reached (Braun & Clarke, 2006). The Corbin and Strauss (1990) grounded theory approach was used for analysis.

Using NVivo, one member of the research team (SK) initially coded the data line by line in an iterative manner alongside data collection. The constant comparative method was used to generate codes by identifying patterns in excerpts within and between participants, using the participants' unique language to label codes whenever possible. Memoing was used to document this decision-making process, reflect on the ways in which the researchers' perspectives may have influenced these decisions, and improve inter-code reliability. Related codes were then nested together to establish categories.

Regular meetings were held with the research teams (AR, SK, and KKT) where sections of transcripts were examined to develop, refine, and reach consensus on key codes and categories and to increase validity (Seale, 1999). Codes were added, removed, or adapted throughout the coding process until no new codes emerged. Relevant categories of codes were those that related directly to the study's goals, came up frequently within individual interviews and across participants.

Results

Three categories emerged, each with several themes and sub-themes (Table 2).

Qualities of a Violation

Participants identified a range of kinds of violating events including those that were both mental (e.g., intrusive thoughts/memories) and physical (e.g., assault, lying). The violations reported ranged from common themes in PTSD (e.g., sexual assault, exposure to warzone) to more idiographic violations (e.g., giving into peer pressure). Despite this variation, participants identified common qualities that make these events violating. Three themes emerged – *contradicts previously held belief*; *lack of consent, agency & control*; and *crossing boundaries*.

Contradicts previously held belief (n=20)

All participants reported that for an event to be violating, it must contradict a previously held belief. As one participant described: "Well I guess if you want to define [violation], I'd say, an external action by somebody else, or an internal action, as in, a thought that occurs in my mind destroying my world view whether it be my present, my future or my past." (P3)

The same appeared to be true in reverse. Even when events were seen as objectively wrong, they were not considered violations if they reinforced one's pre-existing beliefs about themselves, others, and/or the world. In describing why an instance of being mugged was not perceived as a violation, one participant explained:

> *"Maybe because like there's a form of normalization to it in my- Well like, people get jumped and stuff, and so for me it was like 'this is a thing that happens'. And obviously it shouldn't happen, but I'm also like well, it does happen, like there are bad people and this happens. So maybe that's why I feel that [it wasn't a violation]. And maybe if someone else thinks it shouldn't happen, maybe they would feel more violated by that." (P6)*

Lack of consent, agency, & control (n=16)

Most participants also identified the *lack of consent, agency, & control* as a key quality of violation (e.g., control-related power differentials).

> *"I guess how I've experienced violation had to be for control and power over… and abusing that power over someone else whether it be physical or mental or whatever… financial. So I'd say that control and violation go hand-in-hand, you can't violate someone you don't have some sort of control over or power over, I don't think." (P18)*

This included instances where another person did not seek consent before doing something (e.g., sexual assault) as well as times when individuals felt coerced into acting in ways they would not normally act (e.g., peer pressure, manipulation).

For violating mental events, participants highlighted that it was their perceived lack of control over the occurrence and content of these thoughts that made these thoughts violations.

Crossing boundaries (n=15)

Finally, most participants identified *crossing boundaries*, both physical and metaphorical, as a key quality of a violation. As one participant described, *"Um, it can be both physical and mental, in my opinion. It is uh… an invasion of someone's body, and it's also someone's soul" (P4).* When participants discussed crossing boundaries in the context of physical boundaries, this often centered around intrusions on one's personal space, unwanted physical contact, and/or

mistreatment of one's property. Discussions of crossing emotional boundaries included reference to things like manipulation, bullying, degradation, and moral transgressions.

Violation-Related Appraisals

All participants reported that experiencing a violation shifted their beliefs or expectations in one way or another (see *contradicts previously held belief*). Three themes emerged from these new appraisals following a violation – *self-focused appraisals*, *other-focused appraisals*, and *future-oriented appraisals*.

Self-focused appraisals

All participants reported changes in the way they appraised themselves following the violation. For some, these shifts were transient and subsided with time. However, for those who experienced repeated and/or more severe violations, these appraisals became cemented in their perceived identity. Despite acknowledging the distorted nature of these self-perceptions, they still had difficulty letting them go. The emotions reported in response to these self-focused appraisals were shame, guilt, anxiety, dirtiness and self-disgust. Four sub-themes of violation-related appraisals about the self were identified:

Control & choice (n=19). Most participants described feeling less in control of their thoughts and other aspects of their life after experiencing violations. For these individuals, they appeared to generalize the lack of control they experienced during the violation itself to more general beliefs about their ability to control other non-violation-related events. For example:

> *"So I feel like this ideal of perfection is invaded, or violated if you will, by these random negative thoughts that I have absolutely no control over. So, bottom line, it means I have no control over my own life because it's predicated on something that I can't control, which is random intrusive thoughts" (P3)*

Others, who experienced violations wherein they felt their autonomy was taken away appraised themselves as no longer in control of future decisions in their life: *"I feel like I wasn't able to make my own decision. So I feel like I'm following… like I'm a sheep. I feel like I'm living… I'm living somebody else's life now" (P5).* In terms of emotional correlates, appraisals related to *control & choice* were discussed in the context of anxiety and fear.

Responsibility, self-blame & regret (n=17). The sub-theme of *responsibility, self-blame & regret* was closely tied to appraisals of *control & choice*. Interestingly, even in cases of violation where individuals felt they lacked control, there was still an inflated sense of responsibility for the intrusive thought and/or violating event.

> *"It feels like you're no longer in the driver seat, so to speak. It's just like things are happening to you and then at the same time you do feel like you're responsible at least as far as the guilt is concerned. So you do feel like it's your fault, but you don't feel like you're in control" (P15)*

While many participants could acknowledge that they are not to blame for others' violating actions, they still expressed regrets about not acting differently during/after the violation. This self-blame pertained to both acts of commission and omission. Participants reported feelings of shame, guilt, dirtiness, and self-disgust in response to these appraisals. As one described:

> *"I don't know, like, I remember feeling disgusted with myself after it happened, directly after, which is kind of weird because again it's not my fault but I think the feeling of guilt from letting it happen and not doing something to stop it, you know, I had more power, I could've stopped it. I think that just made me feel disgusted with myself I couldn't believe that I would allow that to happen" (P17).*

Self-worth (n=17). Most participants discussed global judgments about *self-worth* that arose after a violation (e.g., being bad, worthless, damaged, blemished). As one participant expressed: *"I feel unworthy, usually. I don't feel like I am equal to others, I feel I am blemished" (P4).*

Self-worth appraisals in the context of trauma-related violations, specifically, centred on specific judgments of the self as being "weak", "small" or "stupid". For some participants with OCD, there was the added belief that they could 'contaminate' others with these qualities. For example:

> *"Yeah, I think I spent a lot of time worried that I'm going to infect other people, cause I think so many negative thoughts, that […] I need to work on being a better person, being a cleaner person, being a prettier person, like that type of thing before I can interact with other people" (P9).*

Regardless of diagnosis, appraisals of self-worth were associated with feelings of shame and dirtiness.

Self-doubt & self-trust (n=14). Finally, many participants reported experiencing self-doubt after a violation. For many, this manifested in doubting their ability to make good decisions. For example:

> *"I like do doubt myself a lot, lot, lot more. Like every decision that I make, - I really stress that I'm making the right decision, and I am really, really indecisive like it takes me forever to choose. And I think it's because [Pause] I don't know, I don't want to make the wrong choice sometimes, and… It's not that I- Like- The sexual abuse was like a choice, but, um… […] I get so worried that, I'm gonna make a wrong choice and something similar to that's gonna happen, but I'm not gonna realize that it's, like, negative for my like mind and not, like, not good for me" (P16).*

For others, this extended beyond doubting their judgment in particular situations and led to a more general lack of trust in themselves as a whole and an instability in their sense of identity. One participant explained:

> *"You feel out of sync with yourself because I think that all of us know deep down who we really are and so when someone says like for example if I say 'you're a bad researcher' […] but then deep down you know you're a good researcher. […] So there's that sort of that dissonance there between what you've always believed in and what this new information you're receiving […] So because internalizing so much of these violating opinions of others somewhere along the way I lost a sense of who I really am" (P3).*

The emotion expressed by participants in response to appraisals of *self-doubt & self-trust* was fear/anxiety, particularly in the context of decision making, interpersonal dynamics, and future planning.

Other-focused appraisals

Many participants described specific appraisals about others – both specific individuals and he world at large – that stemmed from their experience of violation. Given the focus on others, these appraisals were typically discussed in the context of violating external events and were associated with anger and fear/anxiety. Three sub-themes of violation-related appraisals about others were identified: *unfairness & injustice; trust in others;* and *safety of the world.*

Unfairness & injustice (n=9). Several participants expressed that the experience of violation highlighted the degree of *unfairness & injustice* in the world. For many, this was

expressed in discussions about why they experienced the violation and others did not, or why they were not better protected from the violation that they experienced. These thoughts were described alongside feelings of anger or resentment. In describing the abuse one participant experienced from her sister growing up, she described:

> *"I think there's an instinct of like 'well so you just get to hit me? Like… you just get to violate me and I get… I have to just sit there and you get to have all this anger that I had too?'... like we were all going through difficult times, we were all depressed, we were all incredibly anxious with like a caregiver who was like clearly depressed too, but she got to just cause havoc and get a release on me and I had to just be calm and… I don't even know like… I had to… I had to just act responsibly. That was very aggravating so I'm sure there was a moment I thought of like well 'I wish I could do the same back to you', but I couldn't and that just feels unfair, you know?" (P18).*

Trust in others (n=9). Many participants also expressed the perception that experiencing a violation was an indication that others/the world was less trustworthy than they previously thought. As one participant describes: *"Uh, it's painful, it's deflating. And… It… [Pause] Makes me distrustful, and generally, just lose faith in humanity in general just because of the potential that anybody is capable of doing these things" (P12).* These were accompanied by feelings of anger toward the perpetrators, as well as fear about trusting others in the future.

Safety in the world (n=8). Finally, many participants expressed that their sense of the world as a safe place was drastically altered by their experience of violation. As one explained, *"[Being mistreated] like that reinforces the notion that the world is a fundamentally fraught place and can be a dangerous place" (P7).* These appraisals about being unsafe in the world were discussed in the context of anxiety/fear.

Future-oriented appraisals

The third and final theme of violation-related appraisals were *future-oriented appraisals*. These included appraisals participants made about the impact their experience of violation would have on them moving forward and involved feelings of contamination, self-disgust, or fear and anxiety. The one sub-theme was: *permanence of consequences.*

Permanence of consequences (n=10). Many participants reported the appraisal that they would never be the same again after a violation. One participant described: *"So, your body… this*

is a good way to put it, your body was temporarily violated but your mind was permanently violated" (P19).

These appraisals related to feelings of contamination. Specifically, participants reported feeling as though they would be forever tainted and that they could never effectively "cleanse" themselves from the impact of these events. As one participant explained:

> *"Well, the disgust would be about my body and the way people have touched it and hurt it and feeling like it's going to forever be like soiled by that. Or also memories and things that may have been unrelated to the event but related to the person that acted in these events are like contaminated forever" (P10).*

Violation-Related Behaviour

All participants reported engaging in, or having the urge to engage in, behaviours in response to the appraisals and emotions above. The specific behaviours varied greatly, and the same behaviour appeared to serve different functions for different participants. That said, three themes emerged around the function of the behaviour – *reclaiming a sense of control, avoidance/distraction,* and *self-punishment/self-destructive urges.* All behaviours appeared to provide participants with temporary relief from their distress. However, they seemed to either maintain the appraisals mentioned above or participants became dependent on them to cope.

Reclaiming a sense of control (n=20)

All participants reported *reclaiming a sense of control* as a function of their violation-related behaviour. Participants expressed feeling distressed by the notion that they no longer had control over the violation itself. To neutralize the distress associated with the lack of perceived control, participants engaged in different behaviours that gave them a perception of control. These behaviours were typically used in response to appraisals related to *control & choice* and *responsibility.* As one participant described:

> *"... the coping mechanisms are an attempt to exert control, that I didn't have but even though I have control over it, it doesn't mean it's helping me progress in any particular way. Just in the moment, I have control over this instance and that will give me the dopamine and then I'll be able to go on with the rest of my day" (P20).*

Efforts to reclaim a sense of control took on many different forms – controlling one's environment (e.g., counting rituals, physical cleansing, restricting eating, ordering & arranging); hypervigilance and taking extreme precautions to prevent future violation (e.g., excessive problem-solving, rumination, avoiding situations with any risk of contaminants, being hypercautious with the people one trusts); urges to confront, violate, or exert control over others in response to feelings of anger.

Avoidance/distraction (n=12)

Many participants also reported that they had urges to avoid reminders of violations or engaged in behaviours to distract themselves from violating thoughts. This sometimes took the form of cognitive avoidance. One participant explained:

> *"So, if my psyche were this room, there are several doors leading into it and many of the doors that go into places in the past that I don't like or to images of things that I don't want to see have been permanently sealed off and my present it preoccupied with making sure those doors never become unsealed and resealing them when they start cracking open, I guess is a metaphorical way to put it" (P3).*

Other participants engaged in physical behaviour to distract from unwanted thoughts.

> *"Also when I skate, um, it helps a lot because it's really like, physically and mentally draining and so, it like completely washes it out of my brain because I need to put all my focus in my training, and so there's no room for me to think about that situation because I need to focus on something else, and like when you're really tired you don't have the energy to think about it, and so that does help temporarily, too, yeah" (P16).*

How participants distracted themselves from violating thoughts was highly idiosyncratic. Some examples included thought replacement, counting, watching television, and physical exercise.

Self-punishment/self-destructive urges (n=8)

Finally, some participants described engaging in risky behaviour and/or behaviour aimed at self-punishment because of past violations. This was typically linked to appraisals related to *self-worth* and *self-blame, responsibility, & regret*, which led them to feel unworthy of being treated well by themselves or others. For some, this took the form of a passivity toward standing up for oneself in response to mistreatment from others. For example: *"Well maybe a sense of like*

there's nothing worth preserving anymore, there's nothing worth protecting in me anymore, so if another person wants to take advantage of me well then why not? You know?" (P15). Others engaged in more active forms of self-punishment. As one participant described:

> *"I would actually have to say there's a sense of punishment… so like I would take these scalding hot showers and part of this is 'okay I'm trying to wash away what happened' but also 'I should feel the pain because I put myself in that situation'. So, that's what I think kind of like ties with the guilt and the self-blame and the self-loathing afterwards" (P19).*

Finally, several participants described a pattern of engaging in risky behaviours (e.g., reckless driving, excessive drinking) following a violation due to, as one participant describes, *"a disrespect of my own life" (P20)*. Behaviour of this nature appeared to reinforce the appraisals related to *self-worth* and maintained these cycles of maladaptive behaviour and interpersonal dynamics.

Discussion

The present study aimed to elaborate existing theoretical models of mental contamination by exploring the meaning of violation to individuals with OCD and/or trauma histories. Three overarching categories (i.e., *qualities of* violation, *violation-related appraisals,* and *violation-related behaviours*) were identified, each composed of themes and sub-themes (see Table 2). The *violation-related appraisals* themes were associated with different emotional experiences and behavioural urges (see Table 3 & Figure 1).

Within the category of *qualities of violation,* the central theme that emerged was that violations must *contradict a previously held belief.* This aligns with the Moral Dissonance Model (Te Brake & Nauta, 2022), which suggests that psychological distress results from a discrepancy between what "is" and what one believes "ought to be". Negative emotions (i.e., anxiety, anger, contamination) seemed to result from a mismatch between what an individual expected of themselves/others (e.g., being good/trustworthy), and how they appraise themselves/others in a particular situation (e.g., being bad/untrustworthy). This differentiates violation from depressive thought processes, wherein events are appraised as confirming one's existing negative views of themselves, others, and the world (Beck, 1967). It may be that over time, the experience of multiple violations (e.g., repeated mistreatment, longstanding repugnant intrusive thoughts) may lead to a more stable alteration in one's beliefs about themselves, others, or the world. This

aligns with the finding that depressive symptoms tend to arise secondarily to OCD (Rickelt et al., 2016) and that more frequent trauma exposure is predictive of PTSD (Vibhakar, Allen, Gee, & Meiser-Stedman, 2019).

The emotions participants experienced, and behaviour participants engaged in appeared to be driven by their *violation-related appraisals* (see Table 3). Specific *self-focused appraisals* (i.e., *responsibility, self-blame & regret; self-worth; permanence of consequences*) were closely associated with mental contamination-related feelings of shame, guilt, self-disgust, and dirtiness. Other appraisals (i.e., *control & choice; self-doubt & self-trust; safety in the world; permanence of consequences*) resulted in feelings of anxiety and fear. Finally, *other-focused appraisals* (i.e., *unfairness & injustice; trust in others*) were associated with feelings of anger and resentment. Participants reported most frequently engaging in behaviour aimed at *reclaiming a sense of control*, with the specific behaviour dictated by their specific *violation-related appraisal.* For example, appraisals of *self-worth* may be more likely to result in behaviour like washing to reclaim a sense of control by metaphorically "cleansing" the aspects of oneself one perceives as tainted by the violation. By contrast, appraisals of *unfairness & injustice* might instead result in behaviour like confronting others to reclaim a sense of control. Similarly, behaviour that served the function of *avoidance/distraction* was common across all appraisals. However, the specific targets of avoidance differed depending on the specific appraisal (e.g., avoidance of decision making for *self-doubt & self-trust*, avoidance of busy places for *safety in the world*). Finally, participants engaged in behaviours that served the function of *self-punishment/self-destructive urges* most commonly in response to appraisals of *self-worth* and *self-blame, responsibility & regret*.

These findings support existing cognitive models of both OCD (Rachman, 1997, 1998; Salkovskis, 1985) and PTSD (Ehlers & Clark, 2000; Resick et al., 2016), supporting the notion that the way people interpret a violation leads to different emotional outcomes and behavioural urges. Further, they shed light on violation-related appraisals that may be particularly relevant to mental contamination. Research on the cognitive mechanisms driving mental contamination has largely focused on appraisals relating to betrayal thus far (e.g., Millar et al., 2016; Pagdin et al., 2020; Rachman, 2010). Betrayal may be an important type of violation (i.e., a mismatch between one's expectations of others and others' actual behaviour). However, these findings suggest that it may be most relevant to examine the self-focused appraisals people make after experiences of

betrayal (e.g., "I was betrayed because I am worthless") than on appraisals of betrayal itself (e.g., "others are likely to betray me").

The *violation-related behaviour* themes suggest that the behaviour itself is less relevant than the function it serves. These findings add to a growing literature emphasizing the importance of directly targeting the beliefs driving behaviour, rather than the behaviour itself (e.g., Craske et al., 2014; Ehlers & Clark, 2000; Rachman et al., 2015; Resick et al., 2016). For example, exploring the concept of control and highlighting the difference between the illusion of control (e.g., washing) and actual control (e.g., not making decisions driven by one's anxiety) may prove to be more effective than focusing on the washing itself, particularly in the context of mental contamination. Similarly, the findings reinforce the idiosyncratic nature of behaviour and highlight that the same behaviour can serve different functions for different people. For example, washing can be an attempt to *reclaim a sense of control,* a form of *avoidance/distraction*, or a method of *self-punishment/self-destructive urge* depending on the context (Radomsky & Taylor, 2005). Therefore, it is critical for clinicians to understand *why* someone uses a particular behaviour to effectively intervene and to conceptualize washing as one of many possible behaviours relevant to mental contamination. Therefore, it is important to study and assess for broader neutralization behaviour in this context (e.g., mental rituals, ordering/arranging, etc.).

Although data were collected until saturation, it is likely that these themes do not represent an exhaustive list of experiences of violation. Further, most participants in the sample had both OCD and a trauma history. While this is reflective of the close relationship between trauma exposure and OCD (Dykshoorn, 2014), it may represent a unique subset of individuals with OCD and trauma histories. Further, most study participants met criteria for other disorders in addition to OCD and trauma. Therefore, the themes identified here may not be specific to these clinical populations, but rather represent a more transdiagnostic perspective on these topics. While connections between the themes identified in this study are proposed above, an empirical evaluation of these connections is needed to make more conclusive claims. Developing a quantitative measure of these violation-related appraisal themes would help to assess their differential impact on mental contamination as well as other OCD- and PTSD-related symptoms.

This study highlights key violation-related appraisals and interfering behaviours and their relationship with various negative emotions, including feelings of dirtiness and disgust. For mental contamination, appraisals relating to *permanence of consequences, self-worth* and

responsibility, self-blame, & regret appear to be particularly relevant. These findings expand our definition of violation and enrich existing models of mental contamination (Rachman et al., 2015). The identification of specific violation-related appraisals associated with mental contamination serve as promising cognitive intervention targets and an important focus of future quantitative and experimental research.

Table 1. Demographics and Diagnostic Information (N = 20).

Sample demographics		MINI Diagnoses	
Age	*M* = 30.53 (*SD* = 10.74)	OCD only	15% (*N*=3)
Gender	Man 30% (*N* =6)	Criterion A Trauma History only	35% (*N*=7)
	Woman 55% (*N* =11)		
	Non-binary 15% (*N* = 3)		
First Language	English 70% (*N* = 14)	OCD & Trauma History	50% (*N*=10)
	French 10% (*N* = 2)		
	Other 20% (*N* = 4)	PTSD	30% (*N*=6)
Marital Status	Married 10% (*N* = 2)	Mood Disorder	25% (*N*=5)
	Single 85% (*N* = 17)		
	Separated/divorced 5% (*N* = 1)	Anxiety Disorder	25% (*N*=5)
Ethnicity	Caucasian 60% (*N* = 12)		
	Middle Eastern 5% (*N* = 1)	Eating Disorder	15% (*N*=3)
	South Asian 15% (*N* =3)		
	Black 10% (*N* = 2)		
Mental Contamination Symptoms	*M* = 29.60 (*SD* = 20.97)		

Note. MINI = Mini International Neuropsychiatric Interview.

Table 2. Summary of categories, themes, and sub-themes.

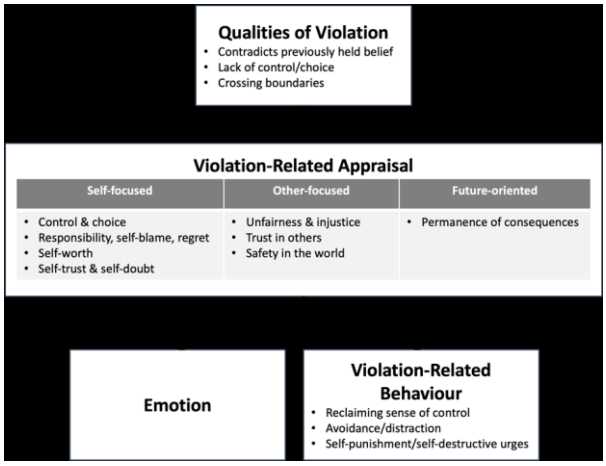
Category	Theme	Sub-theme
Qualities of Violation	Contradicts previously held belief	
	Lack of agency, control, choice	
	Crossing boundaries	
Violation-Related Appraisals	Self-focused appraisals	Control & choice
		Responsibility, self-blame, regret
		Self-worth
		Self-trust & self-doubt
	Other-focused appraisals	Unfairness & injustice
		Trust in others
		Safety in the world
	Future-oriented appraisals	Permanence of consequences
Violation-Related Behaviour	Reclaiming sense of control	
	Avoidance/distraction	
	Self-punishment/self-destructive urges	

Table 3. Summary of the emotional and behavioural correlates of specific violation-related appraisals.

Appraisal	Emotions	Common Behaviour
Control & choice	Anxiety, fear	RSC (e.g., washing, ordering & arranging; excessive problem-solving, restricting eating)
Responsibility, self-blame, regret	Shame, guilt, self-disgust, dirtiness/contamination	RSC (e.g., rumination, hypervigilance, washing) SP/SD (e.g., self-harm)
Self-worth	Shame, self-disgust, dirtiness/contamination	RSC (e.g., physical cleansing) SP/SD (e.g., self-harm, binge drinking, risky sexual behaviour)
Self-trust & self-doubt	Anxiety, fear	RSC (e.g., excessive problem-solving, reassurance seeking) A/D (e.g., avoiding decision-making)
Unfairness & injustice	Anger, resentment	RSC (e.g., confronting others, violating others, advocacy work)
Trust in others	Anger, fear	A/D (e.g., avoiding emotional intimacy, social isolation)
Safety in the world	Anxiety, fear	RSC (e.g., hypervigilance, superstitious behaviour to prevent harm) A/D (e.g., social isolation, avoidance of busy places)
Permanence of consequences	Dirtiness/contamination, self-disgust, fear, anxiety	RSC (e.g., washing) A/D (e.g., thought replacement, activities [e.g., exercise, television, music] to distract, avoidance of physical/emotional intimacy) SP/SD (e.g., self-harm, risky interpersonal relationships)

Note. RSC = Reclaiming a sense of control, A/D = Avoidance/distraction, SP/SD = Self-punishment/self-destructive urges.

Figure 1. Summary of grounded theory analysis categories, themes, sub-themes and framework



CHAPTER 3: Bridge

The cognitive model of mental contamination proposed by Rachman et al. (2015) has been foundational in shaping our understanding of this symptom domain. However, given the limited empirical work on mental contamination at the time of its publication, aspects of the model are not adequately elaborated. Specifically, the definition of certain constructs that are proposed to be central to the model (e.g., "violation") are rather vague. Further, the cognitive mechanisms proposed to drive these feelings were derived from a relatively small body of experimental research.

Study 1 of this dissertation was conducted to elaborate on the cognitive model by exploring the experience of violation and mental contamination qualitatively. The study aimed to better define what qualities constitute a violation, and identify some of the cognitive, behavioural, and emotional elements of violations. Findings from this qualitative study of twenty participants with OCD and/or trauma histories revealed common themes in the ways participants defined "violation". Rather than describing a set of objective events, participants reported that a violation was any event that contradicted a previously held belief, involved a lack of control or choice, and/or crossed a boundary – either physical or metaphorical. Three overarching themes of appraisals of violations also emerged – appraisals about the self, others, and the future – each with several sub-themes. In line with cognitive models (e.g., Ehlers & Clark, 2000; Rachman, 1997, 1998; Salkovskis, 1985), participants reported feeling different emotions when they appraised the violation differently. Participants reported feeling mentally contaminated specifically, when they appraised the violation as an indication of their low self-worth, appraised themselves as responsible for the violation, or appraised the consequences of the violation as permanent.

These qualitative findings reinforce what is proposed in the cognitive model of mental contamination, provide greater precision to the definition of violation, and highlight key appraisals that may drive symptoms of mental contamination. Qualitative work of this kind provides us with a rich and systematic exploration of the perspectives of individuals with lived experience. However, our ability to generalize qualitative findings to broader clinical populations is limited due to small sample sizes and the open-ended, narrative focus of qualitative analysis. Therefore, using the findings from this study to develop a comprehensive quantitative measure of

violation appraisals is an important next step to differentiate between the emotional and behavioural sequelae associated with different types of appraisals.

Existing quantitative measures in this domain are limited in that they either focus on a narrow range of violation appraisals (e.g., appraisals of experiences of betrayal; Pagdin et al., 2020) or on non-violation-specific appraisals relevant to OCD (e.g., Obsessive Compulsive Cognitions Working Group, 2005) or PTSD (e.g., Foa et al., 1999) more broadly. Indeed, a psychometrically sound measure of a broad range of violation appraisals is lacking. We know that violations are associated with a variety of negative emotional outcomes such as mental contamination, anger, shame, guilt, contempt, fear and disgust (Rachman et al., 2015; Rozin et al., 1999). A broad quantitative tool of this kind would, therefore, help us to determine which types of appraisals are predictive of which outcomes.

CHAPTER 4: Development and psychometric evaluation of the Violation Appraisal Measure (VAM)

Obsessive-compulsive disorder (OCD) and posttraumatic stress disorder (PTSD) are mental disorders that affect approximately 2% and 7% of the population, respectively (Gradus, 2007; Ruscio, Stein, Chiu, & Kessler, 2010). OCD is characterized by the presence of obsessions (i.e., distressing intrusive thoughts, images, or impulses) and/or compulsions (i.e., repetitive behaviours) and PTSD is characterized by the experience of intrusive thoughts (e.g., flashbacks), avoidance, negative alterations in mood, and hyperarousal following the experience of a serious traumatic event (American Psychiatric Association, 2013). A key characteristic of both disorders is the presence of violating intrusive mental events. For example, someone with OCD might experience violating repugnant obsessions with immoral themes like pedophilia or incest and someone with PTSD might experience violating intrusive memories of an experience of sexual assault (American Psychiatric Association, 2013).

One of the many negative psychological outcomes of these violating mental events in both disorders is mental contamination. Mental contamination refers to feelings of internal dirtiness and/or washing that occurs without direct contact with a contaminant (Rachman et al., 2015). Cognitive models of mental contamination propose that these feelings are not caused by these mental events themselves, but rather from the meaning individuals ascribe to them. However, empirical research identifying what specific kinds of meanings or misappraisals explain the relationship between violating mental events and subsequent mental contamination is limited. To address this gap, a recent qualitative study (Krause & Radomsky, 2024b) explored mental contamination-related violation appraisals in a sample of participants with OCD and/or trauma histories. The qualitative analysis identified various self-focused appraisal (e.g., responsibility, permanence, self-worth) that may be related to mental contamination, along with broader themes of violation appraisals discussed alongside a range of other negative emotions. However, the relationships between these appraisal themes and mental contamination have not yet been quantitatively assessed. Therefore, the aim of the present study was to develop and validate a quantitative measure of violation appraisals and examine its relationships with symptoms of mental contamination and other negative violation-related psychological sequelae.

As the body of research on mental contamination grows, these feelings have proven to be more common than previously thought (Coughtrey, Shafran, Lee, et al., 2012). Approximately

44% of individuals with OCD report clinically significant levels of mental contamination (Coughtrey, Shafran, Knibbs, et al., 2012) and as much as 81% of a large sample of individuals with a sexual trauma history reported at least moderate levels of mental contamination (Brake et al., 2021). Further, these feelings have been shown to be prevalent, albeit at lower levels, within non-clinical samples as well (see Millar, Coughtrey, Healy, Whittal, & Shafran, 2023; Radomsky, Coughtrey, Shafran, & Rachman, 2018). Though most closely associated with OCD and sexual trauma, weaker associations have also been found between mental contamination and depression, eating disorders, anxiety, and low self-esteem (Coughtrey, Shafran, Bennett, Kothari, & Wade, 2018). Not only are these symptoms pervasive but they are also predictive of more severe symptoms of OCD and PTSD and poorer treatment outcomes (Badour et al., 2023; Mathes, McDermott, et al., 2019). Finally, unlike in contact contamination, washing may actually exacerbate and maintain mental contamination-related feelings of dirtiness and distress (Coughtrey et al., 2014). Consequently, these symptoms can have a profound impact on sufferers' lives.

Cognitive models of OCD and PTSD each emphasize the central role of appraisals in their onset and maintenance. In OCD, the appraisal that one's intrusive thoughts are an indication that one is "mad, bad, or dangerous" has been proposed to underly the disorder (Rachman, 1997, 1998). For PTSD, it is the appraisal of one's trauma-related intrusions as an indication of current threat that is proposed to drive symptomatology (Ehlers & Clark, 2000). Experimental studies have also demonstrated the causal relationship between particular beliefs and more specific symptom domains (Gagné, Kelly-Turner, & Radomsky, 2018). For example, beliefs about losing control (e.g., "I am likely to lose control over my thoughts, emotions, or behaviours"), memory (e.g., "I cannot trust my memory"), and responsibility (e.g., "I am solely responsible for preventing harm") have been shown to contribute to increased checking-related symptomatology (e.g., Alcolado & Radomsky, 2011; Gagné & Radomsky, 2017; Lopatka & Rachman, 1995). Similarly, thought-action fusion (e.g., "If I think about something, it is morally equivalent to acting on it") has been shown to exacerbate obsessions (e.g., Rassin, Merckelbach, Muris, & Spaan, 1999). Cognitive models propose that violation-related appraisals (i.e., the way an individual interprets a violating mental event) are the key cognitive mechanism in understanding mental contamination symptoms (Rachman et al., 2015). However, a violating thought or memory can be misappraised in a multitude of different ways (e.g., I am a bad person, this is

more likely to happen again in the future, others will judge me for this, the world is unsafe, I cannot trust myself). Therefore, research identifying what specific kinds of violation appraisals contribute to mental contamination symptoms and differentiate these symptoms from other violation-related psychological sequelae (e.g., anxiety, anger, sadness, shame) is lacking.

Researchers have begun to examine the role of appraisals related to betrayal as a potential cognitive mechanism in the experience of mental contamination (e.g., French, Salkovskis, & Bream, 2023; Howkins, Millar, & Salkovskis, 2022). These studies have found elevated levels of betrayal sensitivity in individuals high in mental contamination symptomatology (Howkins et al., 2022) and have shown that an autobiographical betrayal imagery task was sufficient to provoke feelings of mental contamination, particularly for those with OCD (French et al., 2023). While these appraisals about the negative impact of betrayal appear to be relevant to mental contamination, they may not capture all mental contamination related violation appraisals. Indeed, the initial cognitive model of mental contamination proposed by Rachman (2004) outlines that betrayal is but one of several different kinds of violations that can lead to mental contamination. Thus, while betrayal sensitivity appears to play an important role in understanding this symptom domain, there may be other important violation appraisals not captured by this construct. Further, researchers have traditionally identified key appraisals in a top-down manner, using existing cognitive theories of OCD and anxiety disorders to guide their selection of appraisals to explore (Rachman et al., 2015). Therefore, they may not capture the full range or nuance of the real-life experience of clinical populations.

To address this gap in the literature, we recently conducted a qualitative study in a sample of individuals with OCD and trauma histories to identify themes of appraisals related to individuals' past experiences of violation in a systematic, inductive manner (Krause & Radomsky, 2024b). Three overarching themes of violation appraisals were identified – self-focused appraisals, other-focused appraisals, and future-oriented appraisals. Within these broader themes, three sub-themes appeared to be most often discussed alongside feelings of mental contamination: permanence of consequences (e.g., "I will never be able to 'un-violate' myself"); self-worth (e.g., "The violation means I am weak"); and responsibility, self-blame, and regret (e.g., "I brought the violation on myself"). These findings suggest that self-focused appraisals that stem from a violation may be more relevant to mental contamination than those focused on what the violation says about others. Instead, findings suggested that other-focused appraisals

were more commonly discussed alongside other negative violation-related emotional outcomes like fear or anger (Krause & Radomsky, 2024b).

These qualitative findings provide a rich foundation for identifying themes of violation-related appraisals. However, research into their relative contributions to symptoms of mental contamination and other violation-related psychological sequelae is limited by the absence of a comprehensive quantitative measure that captures a wide range of violation appraisals. Therefore, the aim of this study was to develop and validate and new measure of violation appraisals based on findings from our previous qualitative study. Secondarily, the study aimed to examine the differential relationships between violation appraisal subscales and a range of violation-related psychological sequelae (i.e., mental contamination, OCD symptoms, PTSD symptoms, depression) to identify which types of appraisals may be most relevant to different symptom domains. To do so, we administered a battery of questionnaires, including items for the new Violation Appraisal Measure (VAM), to two samples of 300 undergraduate students. We conducted an Exploratory Factor Analysis (EFA) and evaluated the psychometric properties of candidate VAM items in the first sample, and then conducted a Confirmatory Factor Analysis (CFA) to validate the factor structure of the VAM in the second sample.

With regard to the measure's psychometric properties, we had four main hypotheses:

1. Internal consistency: There would be good internal consistency for the total scale and each of the subscales.
2. Convergent validity: As the VAM was developed to measure appraisals relevant to a subset of OCD symptoms, we hypothesized that it would be significantly correlated with other OCD-relevant appraisal measures. Specifically, we hypothesized scores on the VAM would be significantly correlated with the Obsessive Beliefs Questionnaire (OBQ; Obsessive Compulsive Cognitions Working Group, 2005), the Fear of Self Questionnaire (FSQ; Aardema et al., 2013), and the Perception of Betrayal Scale (POBS; Pagdin et al., 2020).
3. Divergent validity: As the construct of violation is more central to theoretical models of PTSD and OCD than depression, we hypothesized that we would find lower correlations between scores on the VAM and scores on the depression subscale of the Depression Anxiety and Stress Scale (Lovibond & Lovibond, 1995) than between scores on the VAM and scores on PTSD and OCD symptom measures. Further, as violation appraisals

are completely unrelated from the construct of gratitude, we hypothesized that we would find no correlation between scores on the VAM and scores on the Gratitude Questionnaire – 6 item version (McCullough, Emmons, & Tsang, 2002).

4. Predictive validity: Based on cognitive models of OCD and PTSD (Ehlers & Clark, 2000; Rachman, 1997, 1998), which propose that appraisals drive symptomatology, we hypothesized that scores on the VAM would predict scores on OCD and PTSD symptom measures. Further, given the particular relevance of violation appraisals to cognitive models of mental contamination (Rachman et al., 2015), we hypothesized that VAM scores would predict mental contamination symptoms more strongly than overall OCD or PTSD symptoms. Finally, as this measure was developed to capture appraisals that are not included in existing appraisal measures, we hypothesized that VAM scores would predict symptomatology over and above existing appraisal measures. Specifically, we hypothesized the VAM would significantly predict scores on the Vancouver Obsessional Compulsive Inventory (VOCI; Thordarson et al., 2004) and the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5; Blevins, Weathers, Davis, Witte, & Domino, 2015) over and above scores on the OBQ. We also hypothesized that the VAM would significantly predict scores on the Vancouver Obsessional Compulsive Inventory – Mental Contamination Scale (Radomsky, Rachman, et al., 2014) over and above scores on the POBS, a mental contamination-specific appraisal measure.

Methods

The study received ethical approval from the Concordia University Human Research Ethics Committee (#30013995). Study hypotheses, methods, and analysis plans were preregistered on the Open Science Framework (https://doi.org/10.17605/OSF.IO/D9APC).

Participants

The sample for the study consisted of 600 undergraduate students recruited via Concordia University's Psychology Participant Pool – $n = 300$ for the EFA and $n = 300$ for the CFA. Sample size was determined based on the best practices for scale development outlined by Boateng, Neiland, Frongilo, Melgar-Quinonez, and Young (2018). Participants were provided with course credit as compensation for participation. See Table 4 for demographic information for both samples.

Item Development

Fifty-five candidate items focusing on appraisals of violation were administered. Respondents rated each item on a scale from 0 (disagree strongly) to 4 (agree strongly). Items were developed by SK, a senior doctoral student with experience working with individuals with OCD and trauma in clinical and research contexts. They were refined collaboratively with subject matter experts, including co-author ASR, four doctoral students, and two post-doctoral fellows in the Anxiety and Obsessive-Compulsive Disorder Laboratory at Concordia University. Discussions were held about candidate items during laboratory meetings and consensus about how to adjust the wording of items and which items to include was established based on the majority opinion in these meetings.

Candidate items were developed based on based on cognitive models of mental contamination, clinical experience, and the findings from a recent qualitative study on violation (Krause & Radomsky, 2024b). The qualitative study was conducted in a sample of 20 individuals with OCD and/or trauma histories and used a grounded theory analysis to identify common themes across participants in the types of appraisals they made about past instances of violation. The aim for item development was to develop a comprehensive measure of violation appraisals that relate to both mental contamination and other emotional sequelae. Therefore, the items were designed to reflect the broader, overarching themes of appraisals from the qualitative study, wherever possible using the language of participants themselves. Specifically, they were designed to capture appraisals of the self (e.g., "Having been violated makes me feel weak and small", "Past violations could have been avoided if I were more clever"), others (e.g., "The world is full of people only looking out for their own self-interest"), and the future (e.g., "I am forever tainted by my past violations").

Respondents were first provided with a definition of violation and were prompted to think of a past instance of violation. If they were able to think of a violation, they were able to proceed to the measure. They were then asked to respond to each of the items on the measure based on the violation they had in mind on a 5-point Likert-type scale from 0 ("*Not at all*") to 4 ("*Strongly agree*"). See Appendix B for the final measure.

Measures

Measures of Related Appraisals

Perceptions of Betrayal Scale (PoBS; Pagdin et al., 2020): The PoBS is a 27-item measure designed to measure perceptions of betrayal. All items are rated on a seven-point Likert scale, ranging from 1 ("*Strongly disagree*") to 7 ("*Strongly agree*"). The PoBS has excellent internal consistency (α = .95), and acceptable to good retest reliability (r = .65 to .91). In the current sample the scale also had excellent internal consistency (α = 0.96).

Fear of Self Questionnaire (FSQ; Aardema et al., 2013): The FSQ is a 20-item self-report measure of the degree to which an individual fears they might be, or become, a feared possible self (e.g., "I fear becoming the sort of person I detest"). The FSQ has strong internal consistency in non-clinical (α = .89–.97) and clinical samples (Cronbach's α = .94–.96). The FSQ has strong retest reliability (r = .89-.97) and good divergent and convergent validity (Aardema et al., 2013). In the current sample the scale had excellent internal consistency (α = 0.95)

Obsessive Beliefs Questionnaire – 44 Item Version (OBQ-44; Obsessive Compulsive Cognitions Working Group, 2005): The OBQ-44 is a 44-item self-report measure of the beliefs associated with OCD symptomatology. The measure is made up of three subscales – responsibility/threat estimation, perfectionism/intolerance of uncertainty, and the importance of/control over thoughts. Items on the measure are rated on a seven-point Likert scale ranging from 1 ("*Disagree very much*") to 7 ("*Agree very much*"), with the total score ranging from 44 to 308. The internal consistency of the total score is excellent in both clinical and non-clinical samples (α = .97) and has good convergent and divergent validity (Obsessive Compulsive Cognitions Working Group, 2005). In the current sample the total scale (α = .97) had excellent internal consistency.

Convergent Clinical Symptom Measures

Vancouver Obsessional-Compulsive Inventory – Mental Contamination (VOCI-MC; Radomsky, Rachman, et al., 2014): The VOCI-MC is a 20-item scale designed to measure symptoms of mental contamination. All items are rated on a 5-point Likert scale, ranging from 0 ("*Not at all*") to 4 ("*Very much*"). The VOCI-MC has excellent internal consistency (α = .93), and good convergent (r = .70 to .74), divergent and discriminant validity (Radomsky, Rachman, et al., 2014). In the current sample the scale had excellent internal consistency (α = 0.95)

Vancouver Obsessional-Compulsive Inventory (VOCI; Thordarson et al., 2004): The VOCI is a 55-item measure of OCD symptoms. It assesses six OCD symptom domains –

contamination, checking, repugnant obsessions, hoarding, just right, and indecisiveness. The VOCI and its subscales has shown good to excellent internal consistency (α = .85 to .94), test-retest reliability (r = .90 to .96), convergent and divergent validity (Thordarson et al., 2004). In the current sample the total scale had good internal consistency (α = 0.93).

PTSD Checklist for DSM-5 (PCL-5; Blevins et al., 2015): The PCL-5 is a 20-item measure assessing individuals' severity of PTSD symptoms in the past month, based on DSM-5 criteria. The measure consists of four subscales, corresponding the symptom clusters in the DSM-5. Participants are asked to report the degree to which each symptom bothered them in the past month on a five-point Likert-type scale ranging from 0 ("*Not at all*") to 4 ("*Extremely*"). Total scores range from 0-80. The scale has strong internal consistency (α = .94), retest reliability (r = .82), and convergent and discriminant validity (Blevins et al., 2015). In the current sample the scale had excellent internal consistency (α = 0.96).

Divergent Clinical Symptom Measure

Depression Anxiety and Stress Scale (DASS; Antony et al., 1998): The DASS is a 21-item questionnaire designed to measure depression, anxiety, and stress over the past week. Each item is rated on a four-point Likert-type scale ranging from 0 ("*Did not apply to me at all*") to 3 ("*Applied to me very much, or most of the time*"). The DASS has good internal consistency (α = .91), test-retest reliability (r = .71 to .81), and discriminant validity (r = -.45 to .40). In the current sample the total scale (α = 0.95) and depression subscale (α = 0.92) had excellent internal consistency.

Measure of Divergent Psychological Construct

Gratitude Questionnaire – 6 Item (GQ6; McCullough, Emmons, & Tsang, 2002): The GQ6 was selected as a measure of divergent validity. It is a six-item questionnaire designed to measure the disposition of gratitude. Each item is rated on a seven-point Likert scale, ranging from 1 ("*Strongly disagree*") to 7 ("*Strongly agree*"). The GQ6 has been shown to have acceptable internal consistency (α = .82). In the current sample the scale also had acceptable internal consistency (α = 0.73).

Results

Data Cleaning

Prior to proceeding with the analyses, data were screened for multivariate outliers and missingness not at random (MNAR). Five multivariate outliers were identified based on a visual inspection of a scatterplot of standardized Cook's and Mahalanobis distances. We elected to run the EFA with and without these outliers to assess their impact on the results. Factor loadings remained largely unchanged whether or not they were included. As such, we opted to retain them in the analysis. All variables were also examined to ensure that they were adequately scaled, with variances falling within and appropriate range of one another, and that there were no issues of multicollinearity. Finally, a KMO test indicated that the items had excellent factorability. Participant data was split in half and data analysis took part in two separate phases – an exploratory factor analysis (EFA; $n = 300$) and psychometric analyses, followed by a confirmatory factor analysis (CFA; $n = 300$). There were no significant differences between the two samples with regard to demographic characteristics or symptom/belief endorsement (see Table 4).

Exploratory Factor Analysis

The EFA was conducted using MPlus (Muthén & Muthén, 2017). The VAM's factors were expected to be correlated with one another. Thus, a Geomin oblique rotation was used for the EFA (Field, 2009). We began by running the EFA using the Maximum Likelihood Ratio (MLR) to conduct a parallel analysis. We compared the eigenvalues of the sample correlation matrix to the eigenvalues of the parallel analysis (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Goretzko, Pham, & Bühner, 2021; Velicer & Jackson, 1990) and concluded that a four-factor solution was the point at which the addition of factors stopped representing an improvement over randomness (see Table 5).

Given the ordinal nature of the data (i.e., a 5-point Likert-type scale), information from the parallel analysis was used to rerun the EFA using a Weighted Least Squares estimation (WLSMV) using a three-, four-, and five-factor solution. We compared the Geomin rotated factor loadings for the three different solutions and concluded that the four-factor solution was the most parsimonious solution that resulted in well-defined factors.

The final pool of items for the measure was selected based on an examination of both their factor loadings and the content of the items. Eight items that cross-loaded heavily across multiple factors (i.e., difference in factor loadings of < 0.1 between factors), 24 that did not load heavily on any one factor (i.e., factor loading < 0.45), and 1 deemed confusingly worded were

removed from the measure (Tabachnik & Fidell, 2001), leaving a total of 22 items (see Table 6 and Appendix B). See Appendix C for the 55-item Geomin rotated factor loadings for the four-factor solution and reasons for item deletion The final scale consisted of four subscales – Responsibility & Self-Blame, Permanence, Mistrust, and Self-Worth.

Internal Consistency

Internal consistency was excellent for the total 22-item scale (α = 0.90), and acceptable to good for each of the subscales –Responsibility/Self-Blame (α = 0.89), Permanence (α = 0.85), Mistrust (α = 0.75), Self-Worth (α = 0.77).

Convergent and Divergent Validity

To assess convergent and divergent validity, we hypothesized there would be higher correlations between scores on the new measure and related constructs (e.g., POBS, FSQ, OBQ-44, VOCI-MC, VOCI, PCL-5) than scores on the new measure and unrelated constructs (e.g., DASS – depression subscale; DASS-D; GQ6).

Convergent Validity

In line with our hypotheses, we found significant correlations between the VAM's factors and other OCD- and PTSD- relevant symptom and appraisal measures (i.e., VOCI, PCL-5, VOCI-MC, PoBS, FSQ, OBQ-44; see Table 7). Further, we found higher correlations between the VAM and related appraisal measures (i.e., the PoBS, FSQ and OBQ-44) than between the VAM and symptom measures (i.e., VOCI, PCL-5, VOCI-MC).

Divergent Validity

Scores on the subscales of the VAM were all uncorrelated with the GQ-6 except for the VAM Self-Worth subscale which had a weak negative correlation with the GQ-6. Contrary to our hypotheses, the VAM was significantly correlated with the DASS-D, albeit less correlated with the DASS-D than with the VOCI, PCL-5, or VOCI-MC. Of the VAM's subscales, the Responsibility and Self-Blame subscale was the least correlated with the DASS-D, whereas the Permanence, Mistrust, and Self-Worth subscales were more highly correlated with the DASS-D.

See Table 7 for correlations. Taken together, this indicates good convergent and adequate divergent validity. Of note, the measure was not highly correlated with any of the other measures examined, suggesting that the VAM may capture a distinct construct from measures that have been previously developed.

Predictive Validity

OCD Symptoms

Hierarchical linear regressions were used to assess the predictive validity of the VAM (see Table 8 for statistics from all three regression analyses). First, we examined whether scores on the new measure significantly predicted OCD symptoms (i.e., VOCI scores) over and above demographic variables and existing OCD-relevant belief domains. Three blocks of variables were entered into the model. Demographic variables (i.e., age, gender, ethnicity) were entered as predictors in the first block, OBQ-44 scores were entered as a predictor in the second block, and VAM scores were entered as a predictor in the third block.

Demographic variables were a significant predictor OCD symptoms in the first model, $F(3, 289) = 3.46$, $p = .01$, $R^2 = 0.04$. Specifically, only age ($b = -0.16$, $t = -2.74$, $p = .01$) was a significant predictor. In the second model, adding OCD-relevant belief domains (i.e., OBQ-44 scores) as a predictor significantly improved the model's predictive power, $\Delta F(1, 288) = 282.69$, $p < .001$, $\Delta R^2 = 0.51$. Finally, including violation appraisals (i.e., VAM scores) in the third model ($b = 0.13$, $t = 2.57$, $p = .01$) significantly improved the model's predictive power further, demonstrating that the measure adds small but significant predictive power of OCD symptoms over and above existing OCD-relevant belief domains, $\Delta F(1, 287) = 5.48$, $p = .02$, $\Delta R^2 = 0.01$.

PTSD Symptoms

Next, we assessed whether scores on the new measure significantly predicted PTSD symptoms (i.e., PCL-5 scores) over and above demographic variables and obsessive belief domains. Demographic variables did not significantly predict PTSD symptoms in the first model, $F(3, 291) = 2.11$, $p = .10$, $R^2 = 0.02$. The second model, which included obsessive beliefs, significantly improved the model's predictive power, $\Delta F(1, 288) = 172.50$, $p < .001$, $\Delta R^2 = 0.37$. Finally, when the VAM was added to the third model ($b = 0.56$, $t = 11.57$, $p < 0.001$), there was

once again a significant improvement in model fit $\Delta F(1, 287) = 16.38$, $p < .001$, $\Delta R^2 = 0.03$. See Table 8 for regression statistics.

Mental Contamination

Finally, we assessed whether scores on the new measure significantly predicted mental contamination (i.e., VOCI-MC scores) over and above demographic variables and betrayal-related appraisals (i.e., POBS scores). Model 1 significantly predicted mental contamination, $F(3, 291) = 3.52$, $p = .02$, $R^2 = 0.04$, with age ($b = -0.18$, $t = -3.17$, $p = .002$) being the only significant demographic predictor. In the second model, adding POBS scores significantly improved the model's predictive power, $\Delta F(1, 290) = 99.49$, $p < .001$, $\Delta R^2 = 0.27$. Finally, including violation appraisals in model 3 further significantly improved the model's predictive power, $\Delta F(1,289) = 22.11$, $p < .001$, $\Delta R^2 = 0.05$, demonstrating that the new measure is predictive of mental contamination symptoms over and above betrayal-related appraisals. Specifically, the Permanence ($b = 0.16$, $t = 2.25$, $p = .02$) and Self-Worth ($b = 0.20$, $t = 2.99$, $p = .003$) subscales of the measure were the two subscales that were found to significantly predict mental contamination symptoms. See Table 8 for regression statistics.

Confirmatory Factor Analysis

Finally, a CFA with maximum likelihood estimation was performed using MPlus8 with the second half of the sample ($n = 300$) to evaluate the scale's dimensionality. As recommended by Marsh et al. (2013), we allowed for the correlation of the uniquenesses of four parallel worded items (i.e., items 7, 20, 21, and 45) that shared the same stem (i.e., "Past violations could have been avoided if…") to minimize the confound of method effects on model fit. We found that the model fit indices indicated acceptable to good fit based on the Marsh, Hau, and Grayson (2005) criteria (i.e., CFI ≥ .90, TLI ≥ .90, RMSEA ≤ .05, SRMR ≤ .08), RMSEA = .047, CFI = .945, TLI = .936, X^2 (197) = 395.695, SRMR = .053. The parameter estimates for this model indicated well-defined factors ($\lambda = .46$ to .86, $M = .67$; see Table 9 for all CFA factor loadings), high reliability within each factor ($\omega = .72$ to .87, $M = .815$), and moderate correlations between factors ($r = .29$ to .58), indicating the measurement of related but distinct constructs. The highest correlation was between the Responsibility and Permanence factors, and the lowest was between the Self-Worth and Mistrust factors. See Figure 2 for the CFA path diagram.

Discussion

Cognitive models suggest that specific types of misappraisals of violations may explain the experience of mental contamination (Rachman et al., 2015). However, research in this domain is limited by the lack of validated quantitative tools that can assess for, and measure the strength of, different types of violation appraisals. As such, the current study aimed to develop and validate a novel comprehensive measure of violation appraisals. This new tool was designed to capture a range of appraisal themes and was developed in an inductive manner with items generated from qualitative interviews (Krause & Radomsky, 2024b) as well as previous empirical, theoretical, and clinical work in this area (e.g., Rachman et al., 2015). The current study demonstrated the scale's strong psychometric properties and identified four subscales within the measure – responsibility/self-blame, permanence, mistrust, and self-worth.

For the EFA, a 22-item four-factor solution was deemed most appropriate based on a combination of fit indices from a parallel analysis, factor loadings, and item content. Each of the four factors appeared to capture conceptually distinct types of violation appraisals. Specifically, items on the Responsibility/Self-Blame factor tapped into the appraisal that one could have or should have prevented the occurrence of the violation in some way (e.g., "Past violations could have been avoided if I were more clever"; "I must have done something to invite the violation"). Items on the Permanence factor captured the appraisal that the state of violation is all-encompassing and everlasting (e.g., "Once you have been violated, you cannot be unviolated"; "One violation makes everything feel tainted"). Items on the Mistrust factor related to the appraisal that an experience of violation meant that others and the world were no longer seen as generally trustworthy (e.g., "Nobody can be written off as completely 'safe'"; "I must never let my guard down"). Finally, items on the Self-Worth factor centered around the internalization of a violation as indication that one no longer had worth (e.g., "I have nothing left that's worthy of protecting"; "My safety doesn't matter anymore").

The final 22-item version of the VAM showed good convergent, divergent and predictive validity. As hypothesized, the measure was significantly correlated with related constructs (i.e., betrayal perceptions, fear of self, obsessive beliefs, mental contamination, OCD symptoms, and PTSD symptoms). Further, it was more closely correlated with other appraisal measures (i.e., betrayal perceptions, fear of self, and obsessive beliefs) than symptom measures (i.e., OCD, mental contamination, PTSD, and depression symptoms), and was more closely correlated with

OCD and PTSD symptom measures than with depression. Aside from the Self-Worth Subscale, the measure was not significantly correlated with the divergent gratitude measure and despite its statistical significance, the correlation between the VAM – SW subscale and gratitude was negative and weak. The VAM significantly predicted OCD, PTSD, and mental contamination symptoms over and above demographic and existing relevant appraisal measures. However, in line with cognitive models of mental contamination and as hypothesized, scores on the VAM added greater predictive power in the context of mental contamination than in the context of OCD or PTSD symptoms more broadly.

Contrary to our hypotheses, we did find a significant moderate correlation between the VAM and depressive symptoms, particularly for the Permanence, Mistrust, and Self-Worth Subscales. The idea of violation has traditionally been examined in the context of disorders like OCD and PTSD and has not been explicitly discussed to the same extent in the context of depression. These findings suggest that violation-related appraisals may be worth examining across a wider range of clinical profiles, as they may be more transdiagnostically relevant than we initially anticipated. This aligns with the growing acknowledgement of the conceptual overlap between many anxiety and mood disorders and the identification of many common underlying processes (e.g., Barlow, 2004; Carlucci, Saggino, & Balsamo, 2021; Moses & Barlow, 2006) and previous research that identified correlations between mental contamination and depression (Coughtrey et al., 2018). Indeed, the cognitive triad outlined by Beck (1967, 1976) in early cognitive models of depression aligns closely with the subscales identified on the current measure, with parallels between negative views about the self and the Self-Worth subscale, negative views about the future and the Permanence subscale, and negative views about the world and the Mistrust subscale. While the VAM's subscales parallel this model of depression, the fact that it was more highly correlated with OCD, PTSD, and mental contamination symptom measures than with depression symptoms suggests that it is measuring a set of cognitive biases that are related, but conceptually distinct from those outlined in Beck's (1967, 1976) model. These findings suggest that moving toward a more transdiagnostic approach to understanding the role of violation appraisals in psychopathology could yield interesting insights.

Of the VAM's subscales, the Permanence and Self-Worth subscales were the two that significantly predicted mental contamination symptoms. This aligns with qualitative findings that

also identified associations between these types of appraisals and emotions of dirtiness and self-disgust in individuals with OCD and/or trauma histories (Krause & Radomsky, 2024b). The Responsibility and Mistrust appraisals appear to have a more episodic and external focus on either the individual's behaviour at the time of the violation (Responsibility/Self-Blame) or on others and the world (Mistrust). By contrast, items on the Permanence and Self-Worth subscales seem to reflect an internalization of the meaning of the violation as an indication of something negative and unchanging about the individual's entire being. This distinction in the degree of internalization of the meaning of the violation may, therefore, help to explain the distinction between feelings of mental contamination and other violation-related emotional sequelae (e.g., fear, anger). For violation appraisals related to Responsibility/Self-Blame and Mistrust, there are clearer actions one can engage in to regain a sense of control. For example, someone who appraises themselves as responsible for a violation could take extra care to prevent a similar perceived "mistake" from happening in the future and someone who appraises others and the world as untrustworthy could exercise hypervigilance toward others to give themselves a sense of control. However, when one appraises oneself as the problem in a whole and unchanging way, actions to regain a sense of control over the distress may be more ambiguous. Therefore, this may lead to internal and diffuse discomfort and people may resort, instead, to metaphorical attempts at control like cleansing or washing. Indeed, this aligns with the notion of behavioural self-blame (i.e., the belief that one did something bad) being associated with more adaptive, control-oriented responding, whereas characterological self-blame (i.e., the belief that one is bad) being associated with more maladaptive coping (Janoff-Bulman, 1979).

While the findings from this study demonstrate the strong psychometric properties of the VAM, some important limitations must be noted. First, the present study employed a non-clinical sample of predominantly women in their early twenties. Analogue samples have been shown to be effective at studying OCD phenomena, as symptoms exist on a continuum and are therefore common in lower intensity in the general public (Abramowitz et al., 2014; De Putter, Van Yper, & Koster, 2017). Indeed, the symptom levels seen in this sample are consistent with those generally found in previous research using analogue samples (Abramowitz et al., 2014; see Table 4 for sample characteristics). There also do not appear to be meaningful gender or age differences in the presentation of OCD (Mathes, Morabito, & Schmidt, 2019). However, future research should validate this measure in a clinical population with greater diversity to maximize

its generalizability and to replicate and re-assess the VAM's factor structure and psychometric properties. As we did not collect data about family socioeconomic status, future research should also confirm that this does not impact the psychometric properties of the VAM.

This study was also limited regarding the measures that were included. As we were mainly interested in understanding violation appraisals in the context of mental contamination, the measures that were included were mainly limited to OCD and PTSD symptomatology and beliefs. Expanding this work by examining the relationships between different subscales of the VAM and other clinical phenomena (e.g., depression, eating disorders, personality disorders) would allow for a more comprehensive understanding of the connections between these appraisals and a wider range of emotional and behavioural outcomes. Further, we did not have a PTSD-specific appraisal measure in the study. Therefore, the VAM's added predictive power for PTSD symptoms may have been inflated compared to what would have been found if we included a PTSD-specific appraisal measure in the second step of the hierarchical regression. Finally, some measures (i.e., the POBS, OBQ, VOCI, VOCI-MC, PCL-5) were used to test both the convergent and predictive validity of the VAM. Using these same measures in both analyses may have contributed to some bias and/or redundancy. Therefore, future research is needed confirm the convergent and predictive validity of the VAM using different measures.

The VAM's response options also included a "*Neutral*" option at the midpoint of the scale, which may have affected the validity of the scale. Future research should explore the psychometric impact of this more thoroughly and explore the possibility of using a scale with a different midpoint option. Finally, the data included in the present study were cross-sectional in nature. As we were not able to evaluate the retest reliability of the measure, conclusions cannot yet be drawn about the stability of the VAM over time. Further, while these results identify possible cognitive mechanisms (i.e., violation appraisals relating to permanence and self-worth) that may lead to mental contamination symptoms, the directionality of these relationships cannot be established from these findings. Future experimental work can, therefore, aim to manipulate these different appraisal domains to establish their causal impact on various violation-related outcomes.

Despite these limitations, findings demonstrate that the VAM is a valid and reliable measure of a range of violation appraisals and, to the best of our knowledge, the first comprehensive measure of its kind. This study demonstrated that the appraisals included on the

VAM tap into novel domains not currently captured by other mental contamination-related appraisal measures (e.g., PoBS; Pagdin et al., 2020). The presence of mental contamination symptoms is predictive of poorer treatment outcomes in those with OCD (Mathes, McDermott, et al., 2019). This suggests that there are mechanisms underlying the experience of mental contamination that are not adequately addressed by current first-line treatments for OCD and/or trauma. Indeed, the first-line treatment for contamination-related symptoms is exposure and response prevention (ERP), a behavioural intervention whereby individuals are exposed to their feared contaminants and are encouraged to resist engaging in neutralizing behaviour like washing or avoidance (National Institute for Health and Clinical Excellence, 2005). For mental contamination, however, there appears to be a large cognitive component that may not be targeted by more behaviourally-focused intervention strategies (Coughtrey et al., 2013; Rachman et al., 2015). Therefore, this study has important implications for improving treatment outcomes for those experiencing mental contamination as it provides clinicians with a tool to assess for a range of different misappraisals that may be maintaining symptoms. In doing so, it allows clinicians to tailor their interventions to address a client's idiosyncratic pattern of appraisals, rather than using a one-size-fits-all approach. Further, it provides researchers with a quantitative tool to examine the role of different types of violation appraisals across different symptom profiles. Developing a psychometrically sound comprehensive measure of this kind is, therefore, an important contribution to the search for empirically based cognitive mechanisms in mental contamination and other violation-related emotional and behavioural sequelae.

Table 4. *Demographics from EFA and CFA samples*

EFA Sample (n = 300)				CFA Sample (n =300)			
Sample demographics		Self-report measures *M* (*SD*)		Sample demographics		Self-report measures *M (SD)*	
Age *M (SD)*	23.47 (5.26)	VAM	59.48 (14.89)	Age *M (SD)*	23.23 (5.56)	VAM	57.87 (14.44)
Gender	Man 8.7% (*N* =26)	VOCI-MC	17.16 (16.79)	Gender	Man 11% (*N* = 33)	VOCI-MC	17.47 (16.32)
	Woman 85.7% (*N* = 257)	VOCI	52.66 (40.00)		Woman 86.7% (*N* = 260)	VOCI	55.73 (43.99)
	Non-binary 4% (*N* = 12)	PCL-5	28.67 (19.51)		Non-binary 1.3% (*N* = 4)	PCL-5	27.46 (18.75)
	Trans-man .7% (*N* = 2)	PoBS	115.49 (35.62)		Trans-woman .3% (*N* = 1)	PoBS	111.84 (34.02)
	Other .3% (*N* = 3)	FSQ	83.83 (30.87)		Other .6% (*N* = 2)	FSQ	82.33 (28.76)
1st Language	English 46% (*N* = 138)	OBQ-44	155.89 (53.86)	1st Language	English 52.7% (*N* = 158)	OBQ-44	154.98 (51.51)
	French 21% (*N* = 63)	DASS-D	14.14 (12.00)		French 17.7% (*N* = 53)	DASS-D	12.78 (10.66)
	Arabic 6% (*N* = 18)	GQ-6	29.08 (3.66)		Arabic 4.3% (*N* = 13)	GQ-6	29.53 (3.92)
	Spanish 5.7% (*N* = 17)				Spanish 4% (*N* = 12)		
	Other 21.3% (*N* = 64)				Other 21.3% (*N* = 64)		
Ethnicity	Caucasian 56% (*N* = 168)			Ethnicity	Caucasian 57.7% (*N* = 173)		
	Arab/West Asian 15% (*N* = 45)				Arab/West Asian 14% (*N* = 42)		
	South Asian 6% (*N* = 18)				South Asian 4.3% (*N* = 13)		
	Latin American 5.7% (*N* = 17)				Latin American 5.7% (*N* = 17)		
	East Asian 4% (*N* = 12)				East Asian 4% (*N* = 12)		
	Black 3% (*N* = 9)				Black 3.7% (*N* = 11)		
	Other 10% (*N* = 30)				Other 10.67% (*N* = 32)		

Note. VAM = Violation Appraisal Measure, VOCI-MC = Vancouver Obsessional-Compulsive Inventory – Mental Contamination, VOCI = Vancouver Obsessional-Compulsive Inventory, PCL-5 = PTSD Checklist for DSM-5, PoBS = Perception of Betrayal Scale, FSQ = Fear of Self Questionnaire, OBQ-44 = Obsessive Beliefs Questionnaire – 44 item version, DASS-D = Depression Anxiety and Stress Scale – Depression Subscale, GQ-6 = Gratitude Questionnaire – 6 item version.

Table 5. *Eigenvalues from Sample Correlation Matrix and Parallel Analysis*

Factors	1	2	3	**4**	5	6
Sample Correlation Matrix	17.81	3.86	2.41	**1.85**	1.48	1.38
Parallel Analysis	1.95	1.86	1.79	**1.73**	1.68	1.63

Table 6. *EFA Geomin rotated factor loadings for a four-factor solution with reduced items.*

#	Item	R/SB	P	M	SW
7	Past violations could have been avoided if I were more clever.	0.80*	0.09*	0.01	-0.03
21	Past violations could have been avoided if I were stronger.	0.67*	0.14*	0.06	0.05
45	Past violations could have been avoided if I were more self-assured.	0.67*	0.08	0.08	0.17*
20	Past violations could have been avoided if I were less careless.	0.64*	0.11	0.08	0.08
41	I must have done something to invite the violation.	0.63*	0.13	0.08	0.11
3	If my values were strong enough, they wouldn't be violated.	0.54*	-0.09	-0.12	0.28*
28	If a boundary of mine was crossed, it means I must not have spoken up enough.	0.54*	-0.04	0.20*	0.20*
22	I am forever tainted by my past violations.	0.05	0.70*	0.01*	0.10*
12	One violation makes everything feel tainted.	-0.03	0.63*	0.19*	0.07
18	When a boundary of mine is violated, it taints my entire being.	0.07	0.59*	0.11	0.17*
49	Being violated forever blemishes me.	0.07	0.58*	0.13*	0.27*
17	I grieve the loss of the person I could have been if I had not been violated.	0.16*	0.53*	-0.07	0.09
13	Once you have been violated, you cannot be unviolated.	-0.03	0.49*	0.12	0.09
38	It's impossible to know who is capable of violating you.	0.01	0.01	0.62*	0.01
39	If someone I trust crosses one of my boundaries, it means anyone is capable of crossing one of my boundaries.	0.13*	0.06	0.58*	-0.02
46	Nobody can be written off as completely "safe".	-0.09	0.12	0.57*	0.01
24	There are potential violations around every corner.	-0.01	0.13	0.55*	0.03
55	I must never let my guard down.	0.06	-0.02	0.49*	0.20*
52	I have nothing left that's worthy of protecting.	-0.06	0.03	0.02	0.81*
53	Once my sense of worthiness has been violated, I can never reclaim it.	-0.03	0.11	0.08*	0.78*
4	My safety doesn't matter anymore.	0.14*	0.12	-0.15*	0.46*
27	If I am made to feel weak, I will never be strong again.	0.16*	0.13	0.04	0.42*

Note. R/SB = Responsibility/Self-Blame Subscale, P = Permanence Subscale, M = Mistrust Subscale, SW = Self-Worth Subscale.

Table 7. *Correlations between the 22-item VAM and measures of related/distinct constructs.*

	VAM Tot	VAM-R/SB	VAM-P	VAM-M	VAM-SW	PoBS	FSQ	OBQ-44	VOCI	PCL-5	VOCI-MC	DASS-Dep	GQ-6
VAM Tot	--	.81**	.84**	.65**	.72**	.62**	.64**	.61**	.50**	.51**	.50**	.46**	-.09
VAM-R/SB		--	.47**	.30**	.50**	.36**	.44**	.43**	.30**	.27**	.31**	.26**	-.08
VAM-P			--	.47**	.58**	.60**	.55**	.52**	.45**	.49**	.48**	.40**	-.04
VAM-M				--	.29**	.52**	.47**	.45**	.40**	.42**	.33**	.39**	-.01
VAM-SW					--	.47**	.53**	.45**	.45**	.41**	.45**	.41**	-.16**

Note. VAM = Violation Appraisal Measure, VAM-R/SB = Violation Appraisal Measure – Responsibility/Self-Blame Subscale, VAM-P = Violation Appraisal Measure – Permanence Subscale, VAM-M = Violation Appraisal Measure – Mistrust Subscale, VAM-SW = Violation Appraisal Measure –Self-Worth Subscale, VOCI = Vancouver Obsessional Compulsive Inventory, PCL-5 = PTSD Checklist for DSM-5, VOCI-MC = Vancouver Obsessional Compulsive Inventory – Mental Contamination, PoBS = Perception of Betrayal Scale, FSQ = Fear of Self Questionnaire, OBQ-44 = Obsessive Beliefs Questionnaire – 44 item version, DASS-Dep = Depression Anxiety and Stress Scale – Depression Subscale, GQ-6 = Gratitude Questionnaire – 6 item. * $p < .05$. ** $p < .01$.

VAM	Convergent Measures	Divergent Measures

Table 8. *Statistics from hierarchical regression analyses.*

Outcome variable	Model	Predictors	R^2	β	VIF	Tolerance
VOCI	Model 1		.19			
		Age		-0.16	1.008	0.992
		Gender		0.09	1.011	0.990
		Ethnicity		-0.01	1.008	0.992
	Model 2		.51**			
		Age		-0.08	1.020	0.980
		Gender		0.07	1.011	0.989
		Ethnicity		-0.002	1.008	0.992
		OBQ-44		0.70	1.012	0.988
	Model 3		.52*			
		Age		-0.08	1.024	0.976
		Gender		0.08	1.016	0.984
		Ethnicity		-0.003	1.008	0.992
		OBQ-44		0.623	1.591	0.629
		VAM		0.121	1.596	0.627
PCL-5	Model 1		.01			
		Age		-0.08	1.008	0.992
		Gender		0.12	1.011	0.990
		Ethnicity		0.02	1.008	0.992
	Model 2		.38**			
		Age		-0.01	1.020	0.980
		Gender		0.11	1.011	0.989
		Ethnicity		0.03	1.008	0.992
		OBQ-44		0.61	1.012	0.988
	Model 3		.41**			
		Age		0.001	1.024	0.976
		Gender		0.12	1.016	0.984
		Ethnicity		0.03	1.008	0.992
		OBQ-44		0.47	1.591	0.629
		VAM		0.23	1.596	0.627
VOCI-MC	Model 1		.04			
		Age		-0.18	1.008	0.992
		Gender		0.03	1.011	0.990
		Ethnicity		0.001	1.008	0.992

Model 2		.28**			
	Age		-0.12	1.025	0.975
	Gender		-0.004	1.014	0.986
	Ethnicity		-0.01	1.009	0.992
	POBS		0.50	1.023	0.978
Model 3		.32**			
	Age		-0.11	1.028	0.973
	Gender		0.02	1.026	0.974
	Ethnicity		-0.01	1.009	0.991
	POBS		0.33	1.638	0.611
	VAM		0.29	1.627	0.615

Note. VOCI = Vancouver Obsessional Compulsive Inventory, OBQ-44 = Obsessive Beliefs Questionnaire – 44 item version, VAM = Violation Appraisal Measure, VOCI-MC = Vancouver Obsessional Compulsive Inventory – Mental Contamination Scale, POBS = Perception of Betrayal Scale. * $p < .05$. ** $p < .001$.

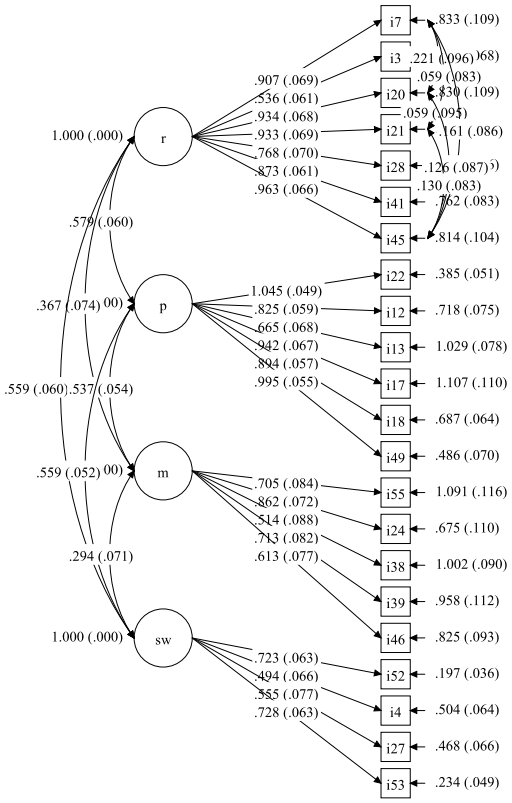
Table 9. *Geomin rotated factor loadings from the CFA.*

#	Item	R/SB	P	M	SW
3	If my values were strong enough, they wouldn't be violated.	0.53*			
7	Past violations could have been avoided if I were more clever.	0.71*			
20	Past violations could have been avoided if I were less careless.	0.72*			
21	Past violations could have been avoided if I were stronger.	0.73*			
28	If a boundary of mine was crossed, it means I must not have spoken up enough.	0.61*			
41	I must have done something to invite the violation.	0.71*			
45	Past violations could have been avoided if I were more self-assured.	0.73*			
12	One violation makes everything feel tainted.		0.70*		
13	Once you have been violated, you cannot be unviolated.		0.55*		
17	I grieve the loss of the person I could have been if I had not been violated.		0.67*		
18	When a boundary of mine is violated, it taints my entire being.		0.73*		
22	I am forever tainted by my past violations.		0.86*		
49	Being violated forever blemishes me.		0.82*		
24	There are potential violations around every corner.			0.72*	
38	It's impossible to know who is capable of violating you.			0.46*	

39	If someone I trust crosses one of my boundaries, it means anyone is capable of crossing one of my boundaries.	0.59*	
46	Nobody can be written off as completely “safe”.	0.56*	
55	I must never let my guard down.	0.56*	
4	My safety doesn’t matter anymore.		0.57*
27	If I am made to feel weak, I will never be strong again.		0.63*
52	I have nothing left that’s worthy of protecting.		0.85*
53	Once my sense of worthiness has been violated, I can never reclaim it.		0.83*

Note. R/SB = Responsibility/Self-Blame Subscale, P = Permanence Subscale, M = Mistrust Subscale, SW = Self-Worth Subscale.

Figure 2. VAM CFA path diagram



Note. r = Violation Appraisal Measure – Responsibility/Self-Blame Subscale, p = Violation Appraisal Measure – Permanence Subscale, m = Violation Appraisal Measure – Mistrust Subscale, sw = Violation Appraisal Measure – Self-Worth Subscale

CHAPTER 5: Bridge

Cognitive theories propose that differences in people's emotional and behavioural responses to internal and external stimuli are explained by how they interpret those stimuli (e.g., D. A. Clark & Beck, 1999; D. M. Clark, 1986; Rachman, 1997). For mental contamination, specifically, Rachman et al. (2015) propose that violating events are the relevant stimulus, and that specific negative self-appraisals that arise from these events lead to feelings of dirtiness and urges to wash. Along these lines, cognitive theory would suggest that different types of violation appraisals would lead people to experience different emotional (e.g., feelings of dirtiness, disgust, anger, shame) and behavioural (e.g., washing, avoidance, checking) sequelae following a violation. However, research on the differential consequences of specific violation appraisals has been limited by the absence of a broad quantitative measure of this kind.

Study 2 was conducted to address this gap by developing and validating a new measure that captured a range of violation appraisal themes identified through qualitative interviews from Study 1 (Krause & Radomsky, 2024b), existing theoretical models (e.g., Rachman, 2004; Rachman et al., 2015), and clinical reports (e.g., Coughtrey et al., 2013; Gershuny et al., 2003). The ultimate aim of developing a tool of this kind was to allow researchers to examine their differential relationship with various violation-related symptom domains, including mental contamination. Results from an EFA in a sample of 300 undergraduate students suggested a four-factor solution – Responsibility/Self-Blame, Permanence, Mistrust, and Self-Worth – which was confirmed through a CFA in a second sample of 300 undergraduate students. Scores on the new Violation Appraisal Measure (VAM) were correlated with related appraisals and OCD, PTSD, and mental contamination symptom measures. Further, VAM scores were predictive of mental contamination symptoms over and above existing appraisal measures. Of the VAM's four factors, the Permanence and Self-Worth factors were significant predictors of mental contamination.

Broadly speaking, these findings support the notion that self-focused violation appraisals may be particularly relevant to understanding symptoms of mental contamination (Rachman et al., 2015; Tipsword et al., 2024). However, the findings from Study 2 were cross-sectional. Therefore, while they suggest possible relationships between particular self-focused violation appraisals and mental contamination, we cannot draw conclusions about causality from these findings alone. An experimental study manipulating these appraisals and observing their impact

on mental contamination symptoms was, therefore, needed to confirm the potential role of these appraisals as cognitive mechanisms in mental contamination.

This kind of experimental research would have important theoretical and clinical implications. First, this would lend additional empirical support for, and precision to, the cognitive model of mental contamination. Further, we know that behavioural interventions like exposure and response prevention are not as effective for this symptom domain (Mathes, McDermott, et al., 2019). Therefore, the identification of causal cognitive mechanisms at play in mental contamination symptoms could help to identify novel intervention targets with potential to improve the effectiveness of interventions for those with this symptom domain.

CHAPTER 6: An experimental investigation of moral self-violation and mental contamination

Obsessive-compulsive disorder is a mental disorder that affects approximately 2% of the population (Ruscio, et al., 2010). It is characterized by the presence of obsessions (i.e., intrusive and distressing thoughts, images, or impulses) and/or compulsions (i.e., repetitive and ritualistic behaviour) (American Psychiatric Association, 2013). Due to the distressing and time-consuming nature of obsessions and compulsions, the disorder has a profound impact on nearly all aspects of sufferers' lives. Cognitive models of OCD highlight the importance of particular beliefs and appraisals in onset and maintenance of the disorder (Rachman, 1997, 1998; Salkovskis, 1985). For longer standing OCD symptom domains (e.g., checking, washing, repugnant obsessions), there is a large body of experimental work that confirms the causal relationship between specific OCD-relevant beliefs and OCD symptomatology (e.g., Gagné & Radomsky, 2017; Ladouceur, Leger, Rheaume, & Dube, 1996; Rachman, Shafran, Mitchell, Trant, & Teachman, 1996), However, for newer identified symptom domains like mental contamination, the experimental literature on causal appraisals is more limited. Cognitive models propose that 'catastrophic misinterpretations of violation' are central to the experience of mental contamination (Rachman et al., 2015). However, there is a relative dearth of experimental research exploring, clarifying, and elaborating on specific types of violation-related appraisals relevant to this symptom domain. Therefore, we aimed to explore the potential causal impact of a specific type of violation perception – perceptions of violation of the moral self-concept – on symptoms of mental contamination.

Mental contamination refers to feelings of contamination or dirtiness that are internal in nature and arise in the absence of direct contact with a contaminant (Coughtrey, Shafran, Knibbs, et al., 2012; Rachman, 2004). Unlike more commonly studied contact contamination that is typically triggered by dirt or germs, mental contamination is instead triggered by people, and results in a diffuse feeling of dirtiness. As a result, washing in the context of mental contamination is often unsuccessful at restoring one's sense of cleanliness (Rachman, 2004). For example, one client reported that having intrusive thoughts about incest made them feel dirty and contaminated. By extension, they also perceived the objects they were engaging with while having these thoughts to be contaminated. In response to these feelings, they would engage in a time-consuming washing and cleaning ritual wherein they would spend hours washing their

hands and disinfecting the object they were using when the thought occurred. However, given that there was no tangible source of dirtiness, these feelings persisted long after washing/cleaning. For this reason, they avoided engaging in many activities they enjoyed (e.g., playing piano) out of fear of permanently contaminating things that were meaningful to them.

The cognitive theory of mental contamination states that such feelings are triggered when an individual negatively misinterprets a perceived violation (Rachman et al., 2015). These feelings of dirtiness can be triggered by thoughts, memories, images, or impulses that are perceived as inappropriate or immoral (e.g., degradation, sexual assault, insults, betrayal)(Elliot & Radomsky, 2009; Rachman et al., 2015). Mental contamination is proposed to ensue when an individual misinterprets such events as an indication that they themselves and/or others perceive them as worthless, weak, and/or insignificant (Rachman et al., 2015). Simply put, believing that one has been 'treated like dirt' (among other things) is proposed to make individuals feel dirty. In the case of the client above, they perceived the obsessional thoughts of incest as evidence that they were "tainted", leading to feelings of dirtiness and washing/cleaning behaviour.

Mental contamination was initially identified and explored within the context of obsessive-compulsive disorder (OCD), with approximately 46% of individuals with OCD reporting clinically significant levels of mental contamination (Coughtrey, Shafran, Knibbs, et al., 2012). More recently, our understanding of mental contamination has expanded, with a growing body of research extending the study of this symptom domain to post-traumatic stress disorder (PTSD; Blakey & Jacoby, 2018; Coughtrey et al., 2018). More specifically, close associations have been found between histories of sexual assault and mental contamination (Badour, Feldner, Babson, Blumenthal, & Dutton, 2013; Fairbrother et al., 2005; Herba & Rachman, 2007), highlighting the relevance of particular types of violation to the experience of mental contamination. Indeed, the cognitive model of mental contamination described by Rachman et al. (2015) outlines several different types of violations that could provoke such feelings, including those associated with betrayal, humiliation, degradation, and assault.

Researchers have successfully evoked feelings of mental contamination both in victims of sexual trauma, by having them recall their past assault (Fairbrother & Rachman, 2004), as well as in healthy undergraduate students, by asking them to listen to recordings portraying sexually violating scenarios (Elliot & Radomsky, 2009; Fairbrother et al., 2005; Herba & Rachman, 2007; Krause & Radomsky, 2021). Across these experiments in clinical and non-

clinical samples, researchers have been able to identify relevant factors that might contribute to the experience of mental contamination. Namely, the moral character of a perpetrator of a violation (Elliot & Radomsky, 2009); degree of, or proximity to, a violation (Elliot & Radomsky, 2009, 2012; Krause & Radomsky, 2021); physical dirtiness of a perpetrator (Elliot & Radomsky, 2012); and pre-task levels of disgust (Fong & Sündermann, 2020) have all been shown to heighten levels of reported internal dirtiness. Though these studies have been helpful in highlighting the situational variables relevant to mental contamination, less is known about the specific appraisals that drive these effects.

Some studies have examined the role of appraisals such as perceptions of responsibility and violation in the context of an imagined unwanted sexual encounter (Elliot & Radomsky, 2013; Kennedy & Simonds, 2017; Krause & Radomsky, 2021). These studies suggest that the more responsible people feel for a violating event, the more they perceive an event as a violation, and the closer in proximity they feel to a violating event, the more mentally contaminated they feel. However, the generalizability of the conclusions from these studies have been limited by their non-experimental design (Elliot & Radomsky, 2013), small sample size (Kennedy & Simonds, 2017), and methodological issues with their manipulations (i.e., ineffectively inducing heightened perceptions of responsibility; Krause & Radomsky, 2021). Further, several of these studies have been criticized for using induction tasks (i.e., imagery tasks involving a non-consensual kiss) that involve elements of imagined contact contamination (i.e., a vivid description of an exchange of saliva). Specifically, Millar et al. (2016) propose that the resulting feelings of dirtiness in this studies may be a response to the imagined idea of physical contamination rather than a response to just the moral violation (i.e., non-consensual sexual contact (Millar et al., 2016). Therefore, this complicates the ability to draw decisive conclusions about the role of moral violation, specifically, in driving mental contamination.

In an attempt to identify violation-related appraisals specific to the moral violation component of mental contamination without contact contamination confounds, Pagdin et al. (2020) have explored appraisals related to betrayal. However, experimental findings suggest that while imagined sexual violation was sufficient to evoke feelings of mental contamination, imagined betrayal was not (Millar et al., 2016). Thus, there appear to be aspects of violation appraisals relevant to the experience of mental contamination not fully captured by one's sense of betrayal. Notably, betrayal is a form of violation that focuses on the perceived impropriety of

others' behaviour. By contrast, case examples of mental contamination also tend to highlight relevant violations wherein an individual feels contaminated by their own impropriety (Rachman et al., 2015). Clinical reports and experimental research suggest that repugnant intrusive urges, images, or memories of past inappropriate behaviour can clash with an individual's moral values and result in feelings of contamination (Rachman et al., 2015; Reuven, Liberman, & Dar, 2014). Along those lines, researchers have successfully provoked feelings of mental contamination in individuals by having them recount an instance of their own immoral behaviour (Zhong & Liljenquist, 2006), as well as by having them imagine being the perpetrator of a non-consensual kiss (Kennedy & Simonds, 2017; Rachman et al., 2012). These scenarios seem to capture a form of violation of the self-concept, or more specifically, of one's desired or preferred self-concept.

Maladaptive appraisals of the self have been identified as maintaining factors in cognitive models of OCD. Specifically, researchers have long acknowledged the role of feared self-concept (i.e., being "mad, bad, or dangerous") in the onset and maintenance of the disorder (Rachman, 1997, 1998). One's "self-concept" is a multidimensional construct made up of different values and beliefs that vary in intensity from person to person and make up the way one views oneself (Doron, Kyrios, & Moulding, 2007; Harter, 1998). Within OCD, the moral self-concept (i.e., the centrality of moral values to one's self-concept) appears to be particularly relevant (e.g., Doron et al., 2007; Rachman & Hodgson, 1980; Reuven et al., 2014). Theoretical models of moral dissonance propose that when an individual's behaviour (i.e., what "is") deviates from their moral code (i.e., what "ought" to be), it results in psychological distress (Te Brake & Nauta, 2022). Thus, for individuals whose self-concept places a high value on morality, violation of this aspect of their self-concept may be relevant to understanding mental contamination. For the present study, we aimed to identify the role that violation of the moral self-concept plays in the context of mental contamination using an experimental paradigm. Secondarily, we sought to explore whether violation of the moral self-concept on its own, in the absence of imagined physical contact, would be sufficient to provoke feelings of mental contamination.

Hypotheses:

1. Manipulation Check:

a. Violation: Those in the Violated Self (VS) condition will report higher VAS ratings of feelings of violation of their sense of self than those in the Bolstered Self (BS) or General Negative (GN) conditions.
b. Affect: Those in the BS condition will report lower ratings of negative affect and higher ratings of positive affect than those in the VS or GN conditions.

2. Mental Contamination: Those in the VS condition will report higher levels of mental contamination – as measured by the feelings subscale of the Mental Contamination Report (Herba & Rachman, 2007) – than those in the BS or GN conditions.
3. Urge to Wash: Those in the VS condition will report a greater urge to wash – as measured by the urges to wash subscale of the Mental Contamination Report (Herba & Rachman, 2007) – than those in the BS or GN conditions.

Method

Participants

The sample consisted of 150 undergraduate students recruited via Concordia University's Psychology Participant Pool. Due to the dimensional nature of OCD-relevant beliefs and symptoms, an analogue sample was used for this study as they have been shown to be effective for studying OCD phenomena (Abramowitz et al., 2014; De Putter et al., 2017; Gagné et al., 2018) and mental contamination, specifically (Millar et al., 2023). The sample size was selected based on an *a priori* power analysis, calculated using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) with a moderate effect size ($f = 0.25$) and a desired power of 0.80. Given that we could not find experiments examining the role of violation of the moral self-concept on mental contamination, the effect sizes used in the calculation were approximated based on related research (e.g., Elliot & Radomsky, 2013; Pagdin et al., 2020). Participants were provided with course credit as compensation for participation. Eligible participants were individuals over 18 years old who could communicate fluently in English.

Measures

Manipulation and Credibility Check

To assess whether or not the violation manipulation was effective, participants were asked to answer four questions about the degree to which they felt that aspects of their sense of self (i.e., their identity, the way they see themselves, their sense of who they are, their personal character) were violated by the feedback they were provided on Visual Analogue Scales (VAS;

ranging from 0-100). The items had excellent internal consistency in the current sample (α = .93). They were also asked to rate the degree to which they experienced various positive (e.g., interested, excited, proud) and negative (e.g., upset, scared, distressed) emotions on VAS (ranging from 0-100). In the current sample, there was good internal consistency for the positive emotion subscale (α = .89), and the negative emotion subscale (α = .86). As a credibility check, they were asked to rate the degree to which they believed the false feedback they were given on a VAS from 0-100.

Mental Contamination Report (MCR; Herba & Rachman, 2007)

The MCR is a measure designed to assess individuals' feelings of mental contamination and urges to wash. Participants are asked to rate the degree to which they are currently experiencing thirteen different mental contamination-related feelings (e.g., dirty, sleazy, cheap). As determined *a priori* in the pre-registration, three emotions (i.e., distressed, sad, afraid) that were not conceptualized as being mental-contamination specific emotions were excluded from the measure to ensure we were capturing mental contamination rather than a more general negative mood state. This left 10 items remaining. The MCR also asks participants to rate the degree to which they have an urge to engage in five different washing behaviours (i.e., rinse their mouth, spit, or drink something; brush their teeth or use mouthwash; wash their face; wash their hands; take a shower). Responses for all items range from 0 ("Not at all") to 100 ("Completely"). The measure had excellent internal consistency in the current sample (α = .91).

Perceptions of Betrayal Scale (POBS; Pagdin et al., 2020)

The POBS is a 27-item measure designed to measure perceptions of betrayal by trusted others. All items are rated on a seven-point Likert scale, ranging from 1 ("Strongly disagree") to 7 ("Strongly agree"). The POBS had excellent internal consistency in the current sample (α = .96).

Vancouver Obsessional-Compulsive Inventory – Mental Contamination (VOCI-MC; Radomsky et al., 2014)

The VOCI-MC is a 20-item scale designed to measure aspects of mental contamination. All items are rated on a 5-point Likert scale, ranging from 0 ("Not at all") to 4 ("Very much"). The VOCI-MC had excellent internal consistency in the current sample (α = .94).

Obsessive Beliefs Questionnaire – 44 Item Version (OBQ-44; Obsessive Compulsive Cognitions Working Group, 2005)

The OBQ-44 is a 44-item self-report measure of the beliefs associated with OCD symptomatology. The measure is made up of three subscales – responsibility/threat estimation, perfectionism/intolerance of uncertainty, and the importance of/control over thoughts. Items on the measure are rated on a seven-point Likert scale ranging from 1 (disagree very much) to 7 (agree very much), with the total score ranging from 44 to 308. The measure had excellent internal consistency in the current sample (α = .96).

Vancouver Obsessional-Compulsive Inventory (VOCI; Thordarson et al., 2004)

The VOCI is a 55-item measure of OCD symptoms. It assesses six OCD symptom domains – contamination, checking, repugnant obsessions, hoarding, just right, and indecisiveness. The VOCI had excellent internal consistency in the current sample (α = .96).

Contamination Sensitivity Scale (CSS; Radomsky et al., 2014)

The CSS is a 24-item questionnaire designed to assess levels of distress associated with feelings of contamination. All items are rated on a five-point Likert scale ranging from 0 ("Not at all") to 4 ("Very much"). Higher scores indicate greater distress from contamination. The CSS had excellent internal consistency in the current sample (α = .92).

PTSD Checklist for DSM-5 (PCL-5; Blevins et al., 2015)

The PCL-5 is a 20-item measure assessing individuals' severity of PTSD symptoms in the past month, based on DSM-5 criteria. The measure consists of four subscales, corresponding the symptom clusters in the DSM-5. Participants are asked to report the degree to which each symptom bothered them in the past month on a five-point Likert-type scale ranging from 0 (not at all) to 4 (extremely). Total scores range from 0-80. The scale had excellent internal consistency in the current sample (α = .95).

Procedure

The study took place online, using Qualtrics software and received ethical approval from the Concordia University Human Research Ethics Committee. Study hypotheses, methods, and analysis plans were preregistered on the Open Science Framework (https://osf.io/yav9k). Participants were first asked to provide consent by reading a consent form online and clicking to indicate that they had read and agree to the terms outlined. They were told that the study examined the relationship between different personality traits and memory. They were then asked to complete a demographics questionnaire.

Next, participants were asked to fill out a bogus personality measure (see Appendix D). They were asked to respond to each of the items as accurately as they could to represent their true self, and were told that after completing the measure they would receive a short description of their personality "type" in comparison to others who had filled it out. After completing the bogus personality measure, participants were provided with false feedback. To replicate a clinical OCD sample, participants were primed to think of morality as being central to their self-concept. To do so, all participants were told that they scored in the top 5th percentile of respondents on the morality subscale, indicating that they have a very strong sense of right and wrong, and highly value acting in accordance with these values. They were also told that this strong moral compass was their most notable quality (see Appendix E).

Using block randomization, participants were randomly assigned to one of three conditions (violated self; VS; bolstered self; BS; or general negative GN) and were given a writing prompt corresponding to their condition. The BS condition was included as a control condition to compare the effect of moral self-violation with those who were asked to think of identity-congruent information. Because the VS condition was expected to produce both a violation of the moral self-concept and negative affect, the GN condition was included to determine whether moral self-violation leads to mental contamination over and above negative mood state on its own. The writing prompts were designed to either reinforce, violate, or be irrelevant to the feedback from the bogus personality test. Writing prompts across conditions were variations of those used in the Pennebaker protocols (Pennebaker, 1997). Those in the VS condition were asked to spend five minutes writing about their very deepest thoughts and feelings about a time in which they did something immoral. Those in the BS condition were asked to spend five minutes writing about their very deepest thoughts and feelings about a time in which they did something morally virtuous. Finally, those in the GN condition were asked to spend five minutes writing their very deepest thoughts and feelings about the tragedy of the Titanic. Following the writing task, participants were asked to complete the manipulation check, MCR, POBS, VOCI-MC, VOCI, OBQ-44, CSS, CTAF, and PCL-5 followed by the credibility check.

Finally, participants were thoroughly debriefed and informed of the deception involved in the study. They were told that the true purpose of the study was to examine the role of violation of the moral self-concept in mental contamination, and were then given the opportunity to

provide true informed consent as to whether they wanted their data to be included given the initial deception. All participants were compensated for their time through one participant pool credit.

Results

Data Screening

The data were screened for univariate and multivariate outliers and tested for ANOVA assumptions. There were no univariate outliers that reflected impossible values, so no data was excluded for subsequent analyses on these grounds. Outcome variables of interest were found to be normally distributed (i.e., kurtosis < |10|, skewness < |3|; Kline, 2015). Data from six participants were excluded from subsequent analyses because they reported a score of less than 50 on the credibility check, indicating that they did not believe the false feedback they were given on the bogus personality measure. Further, data from twelve participants were excluded because at the end of the study, they indicated that they devoted minimal attention to the study, and that this impacted the accuracy of their responses in a significant way. While there were no systematic differences between conditions on most demographic or symptom variables (i.e., PCL-5, CSS, OBQ, POBS), those in the VS condition unexpectedly scored significantly higher on the VOCI, an OCD symptom measure (see Table 10 for demographic information, Table 11 for questionnaire scores by condition). As such, VOCI scores were included as a covariate in all subsequent analyses. Finally, the mean ratings of credibility of the false feedback were high, and there were no significant differences between conditions, VS: M = 82.08, SD =16.4; BS: M = 84.30, SD = 17.21; GN: M = 79.96, SD = 21.56.

Hypothesis 1: Manipulation Check

First, a one-way ANCOVA was conducted to examine the impact of condition (VS, BS, GN) on participants' mean rating of violation of the self (see Figure 3). The effect of condition on violation of the self was significant, $F(3, 146) = 12.60$, $p < .001$, $\eta_p^2 = .21$. Planned contrasts revealed a significant difference in ratings of violation of the self between those in the VS condition (M = 35.06, SE = 3.50) and BS condition (M = 15.53, SE = 3.46), $p < .001$, 95% CI [7.51, 31.55] as well as between those in the VS condition and GN condition (M = 8.67, SE = 3.46), $p < .001$, 95% CI [14.38, 38.40].

Given that negative and positive mood ratings were not found to be significantly correlated with one another (r = -.07, p = .39), two separate one-way ANCOVAs were conducted

to examine the impact of condition on mood (see Figures 3a and 3b). The first ANCOVA revealed a significant effect of condition on positive mood, $F(2, 146) = 6.08$, $p = .003$, $\eta_p^2 = .08$ (Figure 4a). Planned contrasts revealed a significant difference in ratings of positive mood between those in the BS condition ($M = 42.51$, $SE = 3.18$) and those in the VS condition ($M = 27.63$, $SE = 3.22$), $p = .004$, 95% CI [3.81, 25.96], as well as between the BS condition and the GN condition ($M = 30.48$, $SE = 3.18$), $p = .02$, 95% CI [1.18, 22.89].

A second one-way ANCOVA also revealed a significant effect of condition on negative mood, $F(2, 146) = 16.97$, $p < .001$, $\eta_p^2 = .19$ (Figure 4b). Planned contrasts revealed that those in the BS condition ($M = 8.34$, $SE = 3.02$) reported significantly lower ratings of negative affect than those in the VS condition ($M = 25.30$, $SE = 2.13$), $p < .001$, 95% CI [9.64, 24.27]. However, there was no significant different in negative mood between those in the BS condition and those in the GN condition ($M = 12.50$, $SE = 2.10$).

Hypothesis 2: Mental Contamination

A one-way ANCOVA was conducted to examine the impact of condition on ratings of mental contamination (see Figure 5), which revealed a significant omnibus effect, $F(2, 146) = 48.67$, $p < .001$, $\eta_p^2 = .40$. Planned contrasts found that participants reported significantly higher feelings of mental contamination in the VS condition ($M = 35.63$, $SE = 2.29$) than those in both the BS condition ($M = 7.08$, $SE = 2.26$), $p < .001$, 95% CI [20.71, 36.40] and the GN condition ($M = 8.57$, $SE = 2.26$), $p < .001$, 95% CI [19.22, 34.90]. There was no significant difference in ratings of mental contamination between those in the BS and GN conditions.

Hypothesis 3: Urge to Wash

A final one-way ANCOVA was conducted to examine the impact of condition on participants ratings of urge to wash (see Figure 6), which did not reveal a significant omnibus effect, $F(2, 146) = 1.37$, $p = .26$, $\eta_p^2 = .02$. Planned contrasts similarly revealed no significant differences between the VS ($M = 22.24$, $SE = 3.39$), BS ($M = 14.56$, $SE = 3.35$), or GN ($M = 20.09$, $SE = 3.35$) conditions.

Discussion

The present experiment examined the impact of violations of individuals' moral self-concept on subsequent mental contamination using a novel experimental paradigm. Findings from the study suggest that the novel paradigm was effective at provoking the intended violation of moral self-concept in those in the VS condition. While those in the GN condition reported

lower levels of positive mood than the BS condition, there was no significant difference between these conditions with regard to negative mood ratings. As hypothesized, those in the VS condition reported feeling more mentally contaminated after completing the writing task than those in the BS or GN conditions. That said, there was no significant effect of condition on participants' reported levels of urge to wash.

Findings suggest that the manipulation was effective at differentiating between conditions with regard to the primary variable of interest – the degree to which individuals felt their moral self-concept was violated. Specifically, those in the VS condition reported feeling like their moral self-concept was violated significantly more than participants in either of the other two conditions. Further, the writing prompt in the BS condition effectively provoked greater feelings of positive affect after the writing task compared to either of the other two conditions. That said, the manipulation did not effectively provoke negative affect in the GN condition. For the GN condition, the sinking of the Titanic was used as the writing prompt with the intention of inducing non-self-referent negative emotions. It is possible that using this event as the writing prompt may have led participants to think more about the fictional movie *Titanic* rather than the true historical event itself, which may have dampened the intensity of the emotional response. Given that the VS condition provoked both a violation of the moral self and negative affect, the GN condition was included in the study to assess whether violation of the moral self-concept had an impact on mental contamination over and above negative mood state on its own. Indeed, this part of the manipulation did not function as planned. However, the study was able to effectively dampen positive affect in the GN condition, suggesting that the differences between conditions with regard to feelings of mental contamination cannot simply be attributed to differences in affect. That said, future research should aim to use a more emotionally salient writing prompt to provoke negative feelings more effectively in participants.

Cognitive models (Rachman, 1997, 1998; Rachman et al., 2015) have long emphasized the central role of maladaptive appraisals of the self, particularly the moral self, in OCD and of violation in the experience of mental contamination. In line with these models, the present study found that violating individuals' moral self-concept played a causal role in heightening feelings of mental contamination. While one might expect such a task to heighten negative emotions like guilt or shame, this study demonstrated that the induction task was also sufficient to make people feel dirty and contaminated. Past studies have used a range of different violating stressor tasks to

induce mental contamination (e.g., Elliot & Radomsky, 2009; Fairbrother & Rachman, 2004; Krause & Radomsky, 2021; Zhong & Liljenquist, 2006) . That said, many of these studies that have used stressor tasks involving a non-consensual kiss have been criticized as the resulting feelings of dirtiness may be due to elements of both imagined contact and mental contamination (Millar et al., 2016). This study demonstrated that a moral self-violation on its own, in the absence of any real or imagined contact, was sufficient to provoke feelings of dirtiness. These findings suggest that in addition to betrayal-related appraisals (Millar et al., 2016; Pagdin et al., 2020), violation of the moral self-concept may also be key cognitive mechanism in the onset and maintenance of mental contamination concerns.

While sufficient to provoke feelings of mental contamination, violation of the moral self-concept did not result in the hypothesized urge to wash. While some previous experimental work has found mental contamination provocation tasks in analogue samples to provoke urges to wash or engagement in actual washing behaviour (Coughtrey, Shafran, Knibbs, et al., 2012; Elliot & Radomsky, 2012, 2013; Zhong & Liljenquist, 2006), several others have found small to non-existent effects (Coughtrey et al., 2014; Krause & Radomsky, 2021; Rachman et al., 2012). The present study's null findings with regard to urges to wash may be reflective of a possible floor effect due to the non-clinical nature of the sample. While experimental studies have been shown to effectively induce OCD-like phenomena in non-clinical participants, meta-analytic findings show that the discrepancy between the intensity of OCD-relevant outcomes reported by non-clinical and clinical participants is largest with contamination-related symptoms (De Putter et al., 2017). Therefore, while feelings of mental contamination can be provoked effectively in non-clinical samples, the intensity of these feelings is likely smaller than reported in clinical OCD samples (Radomsky et al., 2018). As a result, participants may have less of an urge to neutralize the feelings that do arise. Further, given the internal and diffuse nature of mental contamination, as compared to contact contamination, a wider range of behaviours than those captured on the MCR (e.g., mental rituals, checking) may be used to neutralize these feelings (Coughtrey, Shafran, Knibbs, et al., 2012). Finally, data collection for the present study took place at the height of COVID-19 restrictions. Therefore, the ubiquity of messaging from public health agencies reinforcing the need to wash under situations of contact contamination, may have also influenced the magnitude of these effects.

Despite some methodological limitations, this study effectively evaluated the relevance of a novel mechanism contributing to the experience of mental contamination. Future research could address the lack of differentiation in negative affect between the GN and BS conditions by selecting a more recent or familiar historical event likely to provoke a more intense emotional response in an undergraduate sample. The present study was also limited by the focus on urges to engage in washing-related neutralization behaviour following the manipulation. Future mental contamination research should measure a wider range of neutralization behaviours (e.g., mental rituals, avoidance, checking) to more effectively capture the behavioural impulses associated with these feelings. Additionally, the content of the participants' writing during the writing task was not considered in these analyses. An examination of themes of, and language used in, these writing samples could shed light on additional important moderators in the relationship between violation of the moral self-concept and subsequent feelings of mental contamination. While the manipulation was designed to target moral self-violation, it may have also simultaneously manipulated other related cognitive processes such as moral dissonance and guilt sensitivity. Thus, future research aimed at teasing apart the relative contribution of each of these factors in the experience of mental contamination would improve our understanding of the mechanisms driving mental contamination. Further, the use of a non-clinical analogue sample may have contributed to a floor effect in the intensity of the violation. While analogue samples have been shown to be effective for studying OCD phenomena (Abramowitz et al., 2014; De Putter et al., 2017; Gagné et al., 2018), future research should replicate these findings in a clinical population. Finally, the study was conducted in a sample of predominantly women. To improve the generalizability of the findings, future research should aim to replicate these findings in more gender diverse samples.

Appraisals and beliefs are key to understanding how OCD symptoms are maintained, and by extension, how they can be effectively treated (Rachman, 1997, 1998, 2003; Salkovskis, 1985). Given the relative novelty of acknowledging mental contamination symptoms as distinct from contact contamination symptoms, less is known about the cognitive mechanisms in this specific symptom domain. The present study was the first study to experimentally examine the role of violation of the moral self-concept in this context. Further, this study was novel in that it demonstrated that feelings of mental contamination can be triggered by an imagery task that did not involve any imagined contact or an imagined exchange of bodily fluids. Unlike previous

studies that have used an imagery task of a non-consensual kiss, the present study indicated that moral self-violation alone was sufficient to provoke feelings of mental contamination in the absence of the confound of imagined contact contamination. The finding that moral violation did, indeed, lead to increased levels of feelings of mental contamination underscores the importance of assessing for, and directly targeting these perceptions when working with clients experiencing mental contamination concerns. Specifically, rather than using traditional exposure and response prevention in these cases, these findings instead lend support for the use of cognitive strategies, such as cognitive restructuring and behavioural experiments aimed at challenging perceptions that one's moral self-concept has been violated.

Table 10. Demographics and Descriptive Statistics for Self-Report Measures (N = 150).

Sample demographics		Self-report measures *M* (*SD*)	
Age	25.22 (6.97)	VOCI-MC	14.23 (13.62)
Gender	Man 16% (*N* =24)	POBS	112.90 (34.24)
	Woman 80.67% (*N* =121)	VOCI	44.06 (34.32)
	Non-binary 2.7% (*N* = 4)	OBQ-44	149.78 (46.04)
	Trans-woman .7% (*N* = 1)	CSS	28.89 (16.96)
First Language	English 54.7% (*N* = 82)	PCL-5	25.12 (17.98)
	French 13.3% (*N* = 20)		
	Arabic 8% (*N* = 12)		
	Other 24% (*N* = 36)		
Marital Status	Married/domestic partnership 12.7% (*N* = 19)		
	Single 83.3% (*N* = 125)		
	Separated/divorced 4%% (*N* = 6)		
Ethnicity	Caucasian 61.3% (*N* = 92)		
	Arab/West Asian 17.3% (*N* = 26)		
	East Asian 6% (*N* = 9)		
	South Asian 4.7% (*N* =7)		
	Latin American 4% (*N* = 6)		
	Other 6.7% (*N* = 10)		

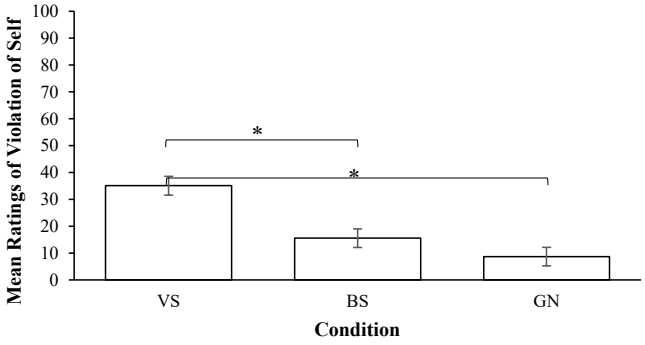
Note. VOCI-MC = Vancouver Obsessional Compulsive Inventory – Mental Contamination Scale, POBS = Perception of Betrayal Scale, VOCI = Vancouver Obsessional Compulsive Inventory, OBQ-44 = Obsessive Beliefs Questionnaire – 44 Item Version, CSS = Contamination Sensitivity Scale, CTAF = Contamination Thought-Action Fusion Scale, PCL-5 = PTSD Checklist for DSM-5.

Table 11. Descriptive Statistics for Self-Report Measures by Condition (N = 150)

	Violated Self *M(SD)*	Bolstered Self *M(SD)*	General Negative *M(SD)*
Self-violation	36.03 (29.10)	15.02 (25.43)	8.2 (17.29)
VOCI-MC	16.72 (16.46)	13.54 (11.34)	12.44 (12.44)
POBS	115.12 (37.44)	108.02 (32.03)	115.56 (33.15)
VOCI	54.82 (39.13)	38.50 (29.85)	38.86 (31.31)
OBQ-44	161.02 (49.91)	142.40 (46.62)	145.92 (39.78)
CSS	31.10 (17.98)	27.26 (16.63)	28.32 (16.35)

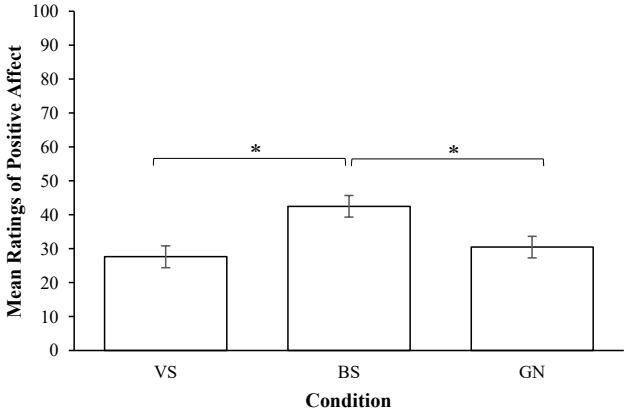
Note. VOCI-MC = Vancouver Obsessional Compulsive Inventory – Mental Contamination Scale, POBS = Perception of Betrayal Scale, VOCI = Vancouver Obsessional Compulsive Inventory, OBQ-44 = Obsessive Beliefs Questionnaire – 44 Item Version, CSS = Contamination Sensitivity Scale, CTAF = Contamination Thought-Action Fusion Scale, PCL-5 = PTSD Checklist for DSM-5.

Figure 3. Average Manipulation Check Ratings of Perceived Violation of the Self



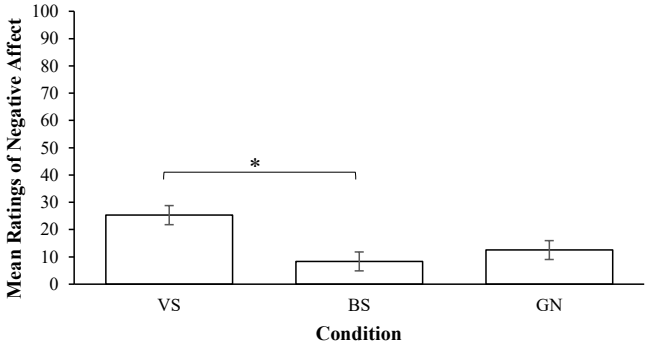
Note. VS = Violated Self, BS = Bolstered Self, GN = General Negative, * = $p < .05$, ,** = $p < .001$

Figure 4a. Average Manipulation Check Ratings of Positive Affect



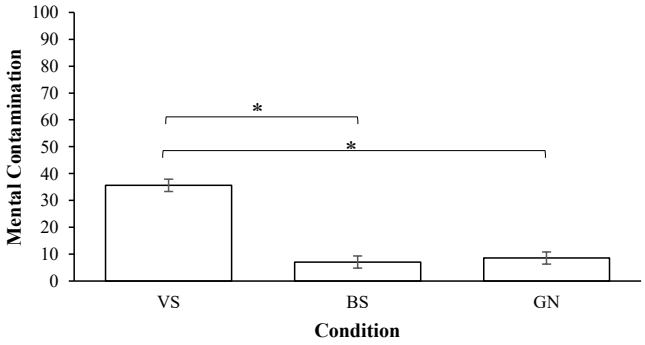
Note. VS = Violated Self, BS = Bolstered Self, GN = General Negative, * = $p < .05$, ,** = $p < .001$

Figure 4b. Average Manipulation Check Ratings of Negative Affect



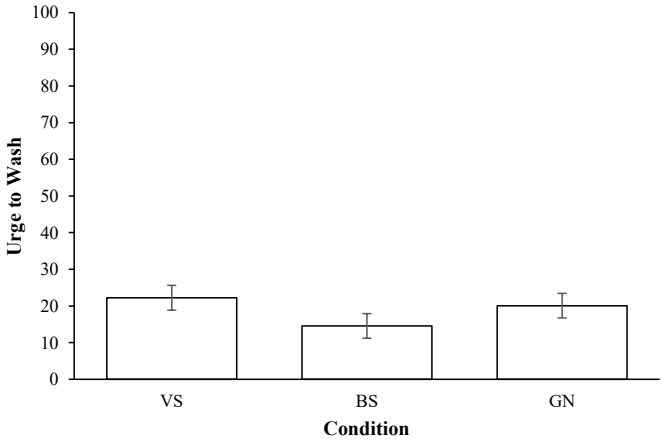
Note. VS = Violated Self, BS = Bolstered Self, GN = General Negative, * = $p < .05$, ,** = $p < .001$

Figure 5. Average Mental Contamination Ratings by Condition



Note. VS = Violated Self, BS = Bolstered Self, GN = General Negative, * = $p < .05$, ,** = $p < .001$

Figure 6. Average Urge to Wash Ratings by Condition



Note. VS = Violated Self, BS = Bolstered Self, GN = General Negative, * = $p < .05$, ,** = $p < .001$

CHAPTER 7: General Discussion

This program of research aimed to elaborate on and refine the existing cognitive model of mental contamination. Research has demonstrated the pervasiveness of these symptoms, particularly in the context of OCD and trauma (e.g., Brake et al., 2021; Coughtrey, Shafran, Knibbs, et al., 2012). While the cognitive model of mental contamination proposed by Rachman et al. (2015) has been foundational in advancing our understanding and treatment of these symptoms, aspects of it remained vague and/or lacking in empirical support. Therefore, this program of research sought to improve upon the cognitive model by addressing these gaps. Specifically, the work aimed to clarify key constructs within the model (e.g., "violation") and identify specific appraisals of violations that may drive these feelings.

Study 1 was designed to develop a clear definition of the construct of "violation" and identify possible relationships between different violation-related appraisals and violation-related emotional sequelae in a sample of those with OCD and/or trauma histories. These findings were used to develop a quantitative measure of violation appraisals, the Violation Appraisal Measure (VAM), which was validated in Study 2. The VAM was developed to capture a range of different violation appraisal themes to examine the types of appraisals that may be most relevant to mental contamination symptoms. Finally, Study 3 involved an experiment that was designed to examine the causal role of appraisals of moral self-violation on mental contamination symptoms.

Summary of Findings

Study 1

Semi-structured qualitative interviews about violation were conducted in a sample of twenty participants with OCD and/or trauma histories. Grounded theory was used to analyze transcripts from the interviews (Corbin & Strauss, 1990). Three categories emerged from the analysis – *qualities of violation, violation-related appraisals,* and *violation-related behaviours* – each with several themes and sub-themes. All participants reported that the defining quality of a violation was an event that contradicts a previously held belief. There were three overarching themes of violation-related appraisals that emerged – *self-focused appraisals, other-focused appraisals,* and *future-oriented appraisals.* Different violation-related appraisals were associated with different emotions and behavioural urges. Specific appraisal sub-themes (i.e., *permanence of consequences; self-worth; responsibility, self-blame & regret*) were most commonly discussed

alongside mental contamination-related emotions. While the specific behaviours participants reported engaging in were highly idiosyncratic, common themes emerged regarding the function of their behaviours – *reclaiming a sense of control, avoidance/distraction,* and *self-punishment/self-destructive urges.*

Study 2

Fifty-five candidate items were generated to capture different types of violation appraisals based on a combination of the qualitative interviews from Study 1, theoretical models, and clinical experience. An exploratory factor analysis (EFA) revealed four underlying factors: Responsibility and Self-Blame (R/SB; Factory 1), Permanence (P; Factor 2), Mistrust (M; Factor 3), and Self-Worth (SW; Factor 4). This factor structure was confirmed through a confirmatory factor analysis (CFA). The final VAM consists of 22 items, which were selected based on factor loadings and item content. The total scale had excellent internal consistency, the R/SB and P subscales had good internal consistency, and the M and SW subscales had acceptable internal consistency. As hypothesized, the measure was significantly correlated with related constructs (i.e., betrayal perceptions, fear of self, OCD-relevant beliefs, mental contamination, OCD symptoms, and PTSD symptoms). Further, it was more closely correlated with other appraisal measures (i.e., PoBS, FSQ, OBQ-44) than symptom measures (i.e., VOCI, VOCI-MC, PCL-5, DASS-Dep), and was more closely correlated with OCD and PTSD symptom measures than with depression. Aside from the SW Subscale, the measure was not significantly correlated with the divergent gratitude measure and despite its statistical significance, the correlation between the SW subscale and the GQ-6 was negative and weak. The VAM significantly predicted OCD, PTSD, and mental contamination symptoms over and above demographic and existing relevant appraisal measures. However, in line with cognitive models of mental contamination and as hypothesized, scores on the VAM added greater predictive power in the context of mental contamination than in the context of OCD or PTSD symptoms more broadly. The R/SB and P subscales were the two VAM subscales that significantly predicted mental contamination symptoms.

Study 3

For this experiment, 150 undergraduate students were randomly assigned to one of three conditions – violated self (VS), bolstered self (BS), or general negative (GN). All participants completed a bogus personality test and received the false feedback that they scored in the top 5th

percentile for morality. Those in the VS condition were then asked to write about a time they did something immoral, those in the BS condition were told to write about a time they did something morally virtuous, and those in the GN condition were told to write about a non-self-referent negative event (i.e., the sinking of the Titanic). The manipulation was effective at violating participants sense of self but was not effective at inducing negative emotions in the GN conditions. Participants in the VS condition (vs. BS and GN) reported significantly higher levels of feelings of mental contamination than those in the BS or GN conditions. However, there were no significant differences between conditions regarding urges to wash.

Limitations and Future Directions

The generalizability of the findings from this program of research may be limited by the makeup of the samples across the three studies. Indeed, Studies 2 and 3 were conducted in analogue samples. While analogue samples have been shown to be appropriate for studying OCD phenomena due to the dimensional nature of symptoms (Abramowitz et al., 2014), the non-clinical nature of these samples may still have had an impact on the results. Specifically, meta-analytic findings have shown that the largest discrepancy in OCD-relevant outcomes reported between non-clinical and clinical participants is seen with contamination-related symptoms (De Putter et al., 2017). Therefore, the intensity of contamination fears in analogue samples is likely much less than what would be expected in clinical samples. Therefore, it is possible that the nature of the relationships between the outcomes of interest could differ within individuals with higher levels of contamination-related symptomatology. For Study 3 specifically, the non-clinical nature of the sample may have limited the sensitivity of the paradigm to behavioural changes. Future research should aim to replicate these findings in clinical samples and/or in samples with elevated contamination fears to confirm these results.

Along these lines, Study 2 is also limited by the fact that I did not explore the measurement invariance of the VAM. As such, I cannot definitively conclude that the items on the measure function the same way across different populations. This study established the foundational psychometric properties for the measure. However, future research should explore the VAM's measurement invariance regarding symptom severity as well as demographic qualities such as age and gender. It will also be important to confirm the VAM's factor structure in a clinical sample to further validate the findings from this study.

While Study 1 employed a sample of individuals with OCD and/or trauma histories, the makeup of the sample also posed some limitations to generalizability. First, there were high rates of comorbidity between those with trauma histories and OCD. Indeed, lifetime prevalence of PTSD in those with OCD is high (~19%) and lifetime prevalence of OCD in those with PTSD is also high (~41%; Fenlon et al., 2024). While the makeup of the sample for Study 1 reflects this close relationship, those with comorbid OCD and trauma reflect a unique subset of these populations that have been shown to have more severe OCD symptoms and poorer treatment outcomes (Pinciotti, Wetterneck, & Riemann, 2022). Further, there were high rates of comorbidity with other non-OCD or trauma-related disorders (e.g., anxiety, mood, eating disorders). Despite this heterogeneity in diagnostic profiles, common themes still emerged across participants, suggesting that violation-related sequelae may be more transdiagnostically relevant than previously thought. As such, future research could aim to compare the experience of mental contamination in diagnostically "pure" samples with transdiagnostic samples to establish more definitively its stability across diagnostic profiles.

Regarding Study 3, there were methodological limitations within the experiment that could be improved upon in future research. Specifically, the GN manipulation was not effective at inducing negative emotions. This impacted our ability to effectively control for the effects of general negative mood states on mental contamination feelings. Therefore, it remains possible that the effects of condition on mental contamination feelings may have been a result of the negative mood induction in the VS condition, rather than from the self-violation specifically. Future research should, therefore, aim to replicate this paradigm using a more potent non-self-referent negative mood induction to tease apart these effects. Another important limitation of Study 3 was that the behavioural outcome measure only assessed washing-related urges. The feelings of dirtiness that arise in mental contamination are often difficult to pinpoint or localize (Coughtrey, Shafran, Lee, et al., 2012; Rachman et al., 2015). Therefore, this diffuseness may lead to a wider range of behavioural urges to neutralize the feelings than seen in contact contamination. Indeed, participants in Study 1 reported a wide range of non-washing behaviours they engaged in in response to feelings of mental contamination, including mental rituals (e.g., thought replacement/suppression, distraction, checking). Future experimental research on mental contamination would benefit from an updated measure that includes a wider range of neutralizing behaviour. Alternatively, findings from Study 1 suggest that it may be more

beneficial to develop a measure that assesses the intensity of different behavioural functions (e.g., avoidance vs. reclaiming control vs. self-punishment), rather than behaviour type (e.g., washing hands vs. showering vs. thought replacement). To this end, I recently proposed an updated version of the Mental Contamination Report, a commonly used measure for mental contamination-related experiments, that captures behaviour function rather than behaviour type (Krause, Fridgen, & Radomsky, under review).

Theoretical Implications

This program of research was designed to validate and expand upon the cognitive model of mental contamination (Rachman et al., 2015). Drawing on theory from existing, established cognitive models of anxiety disorders (e.g., D. M. Clark, 1986; Ehlers & Clark, 2000; Rachman, 1997), this model proposes that feelings of mental contamination arise when individuals negatively misappraise specific internal and external stimuli. In the case of mental contamination, the stimulus that is misappraised is a perceived violation (e.g., intrusive repugnant obsession, memory of past assault/betrayal). All three studies included in this program of research add greater nuance and specificity to this model and underscore the relevance of mental contamination within and beyond OCD.

This collection of studies lend support to the conceptualization of mental contamination as a transdiagnostic experience. While originally explored in samples of sexual assault survivors (Fairbrother et al., 2005; Fairbrother & Rachman, 2004), the vast majority of research on this symptom domain since then has focused on its phenomenology the context of OCD. The collection of results discussed above, however, suggests that these experiences extend well beyond the realm of OCD. In Study 1, the nature of the violations that served as triggers for feelings of contamination were highly heterogenous, ranging from external events (e.g., traumatic events) to internal events (e.g., intrusive thoughts) and ranging from the rather innocuous (e.g., disclosing a friend's secret, giving into peer pressure) to the more severe (e.g., rape, physical abuse). Similarly, participants in the violated self condition in Study 3, who went on to report higher levels of mental contamination, wrote about highly idiosyncratic moral improprieties in the writing task. These ranges of events are clearly not bound to any specific diagnostic classification. Instead, it seems that the experience of mental contamination may be better explained by a general violation of one's moral norms or expectations, than about any

specific diagnostic profile or category. Indeed, this aligns with the correlations found between the VAM's subscales in Study 2 and OCD, PTSD and depression symptoms. Taken together, this series of results supports the value of conceptualizing mental contamination as a psychological phenomenon in its own right, rather than as a subtype of OCD contamination fears.

In addition to highlighting the transdiagnostic relevance of these experiences, Study 1 also helped to clarify the meaning of the construct of "violation". The cognitive model proposes that violations are the initial stimuli that lead to mental contamination symptoms and Rachman et al. (2015) provide examples of common violations (e.g., betrayal, harsh criticism, sexual assault). However, despite its centrality to the model, the authors do not propose a clear definition of what qualities make an event a violation. The themes identified in Study 1 help to address this gap by identifying common themes in the definitions of "violation" provided by those with OCD and/or trauma histories. Specifically, the findings from Study 1 suggest that a violation can be conceptualized as an event that contradicts a previously help belief wherein a boundary is crossed and there is a lack of control. A unifying definition of this kind provides greater clarity and generalizability to the cognitive model.

Finally, and perhaps most importantly, all three studies add greater specificity and empirical grounding to the appraisals that the cognitive model proposes drive mental contamination. Broadly speaking, the results from these studies suggest that appraisals of violation of one's sense of self may be particularly important mechanisms in mental contamination. Studies 1 and 2 demonstrated that violation appraisals related to self-worth and permanence of consequences are associated with, and predictive of, feelings of dirtiness, self-disgust, and mental contamination. Study 3 highlighted the causal relationship between appraisals of moral self-violation and subsequent feelings of mental contamination. This collection of results aligns with cognitive models of OCD (Rachman, 1997, 1998) and PTSD (Ehlers & Clark, 2000; Resick et al., 2016), which have long emphasized the roles of maladaptive appraisals of the self as maintaining factors in both disorders and adds nuance to existing conceptualizations of these self-focused appraisals. Specifically, these findings suggest that it may not be that all people with OCD truly believe themselves to be "mad, bad, or dangerous" as proposed by Rachman (1997, 1998). Rather, it seems that individuals believe themselves to be sane, good, and safe but experiences with others (e.g., interpersonal trauma)

and/or internal experiences (e.g., intrusive thoughts) are appraised as permanently violating this sense of who they are/were.

Clinical Implications

While exposure and response prevention (ERP) is currently recognized as the 'gold standard' treatment for OCD, approximately half of clients who receive ERP fail to achieve symptom remission (e.g., Fisher & Wells, 2005). Treatment outcomes are worse, still, for individuals who present with mental contamination symptoms at baseline (Mathes, McDermott, et al., 2019) and for those with comorbid trauma and OCD (Pinciotti et al., 2022). The reason for these shortcomings may be twofold. First, because of its relative underrepresentation in research, mental contamination symptoms are often misconceptualized and treated as contact contamination or missed altogether. Second, previous research proposes that mental contamination may be a more cognitive process than contact contamination concerns, which may not respond as readily to a purely behavioural approach to treatment. This program of research has important clinical implications that address both issues.

Studies 1 and 2 underscore the distinctiveness of mental contamination from contact contamination symptoms and demonstrate that these symptoms may be more transdiagnostically relevant than previously thought. Study 1 added to a growing body of research highlighting the pervasiveness of mental contamination in both OCD and trauma. Similarly, Study 2 highlighted relationships between mental contamination-related appraisals and symptoms of OCD, PTSD, as well as other disorders like depression. These findings underscore the importance of assessing for these symptoms in a wider range of clinical populations. The findings from Study 1 also suggest that washing may be just one of a range of behaviours individuals may engage in to neutralize distress associated with these contamination fears. As such, it underscores the need for clinicians to assess for mental contamination in a wider range of clinical populations and to assess for a wider range of neutralizing behaviour when a client presents with contamination fears of this kind (e.g., thought suppression, avoidance, self-destructive behaviour). As pre-treatment levels of mental contamination seem to be predictive of poorer treatment response (Mathes, McDermott, et al., 2019), ensuring that these sequelae do not go undetected may be important for improving treatment outcomes.

Further, this program of research has important implications for conceptualizing cases. Specifically, this collection of results reinforces the idea that not all instances of excessive or distressing contamination and washing are driven by a fear of physical contaminants. Indeed, traditional ERP approaches to treating contamination symptoms would typically involve a hierarchy of exposures to increasingly fearful triggers of contamination while preventing individuals from engaging in washing. For example, ERP for an individual who feels dirty in response to pedophilic obsessions might involve exposure to environments with children and the prevention of washing behaviour. This approach might allow the individual to habituate to the feelings of distress triggered in these situations and learn that they can regulate those feelings. However, it may be less effective for addressing the underlying self-focused appraisals that may actually drive these symptoms.

Interventions for mental contamination may be more effective when cognitive strategies are incorporated. However, there has been limited research identifying specific, empirically grounded cognitive intervention targets in this symptom domain compared to others. This series of studies, however, helps to address this gap by shedding light on promising cognitive mechanisms that may otherwise go unaddressed in traditional behavioural approaches to treatment. Specifically, these results suggest that it may be important to directly target self-focused appraisals about the meaning of violations to maximize outcomes. For example, results from Studies 2 and 3 highlight the potential benefit of exploring underlying beliefs about self-worth (e.g., "these thoughts make me unworthy of happiness"), permanence (e.g., "I am forever tainted by having these thoughts"), and morality (e.g., "I am evil/immoral for having these thoughts"). To this end, it may be beneficial to incorporate cognitive strategies like cognitive restructuring, psychoeducation, and behavioural experiments to improve treatment outcomes. For example, clinicians can incorporate psychoeducation about the pervasiveness of violations of different kinds, conduct surveys of others' perceptions of someone who has experienced similar violations, or strategic disclosures of violations to trusted others.

Conclusions

There is a growing acknowledgement of the pervasiveness of mental contamination, particularly in the context of OCD and in sexual assault survivors (Brake et al., 2021; Coughtrey, Shafran, Knibbs, et al., 2012). While the cognitive model of mental contamination (Rachman et

al., 2015) has been foundational in understanding and treating these symptoms, it was limited by the scarcity of empirical research on mental contamination at the time of its development. The current program of research has expanded upon this model by clarifying the meaning of the construct of violation and identifying violation appraisals relevant to mental contamination. It has demonstrated that these violation appraisals can be assessed in a reliable and valid manner, and that the induction of specific moral self-violation appraisals has a causal impact on mental contamination feelings. I hope that the findings outlined above will contribute to the continued exploration of the cognitive mechanisms underlying mental contamination with the ultimate goal of helping individuals struggling with these symptoms more effectively.

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APPENDIX A: Semi-Structured Interview Guide (Study 1)

Defining Violation: As I mentioned in the introduction, we are interested in better understanding the concept of violation. So to start, I would like to get an understanding of what does "being violated" means to you?

Follow-up prompts:

- How does it feel?
- What kinds of thoughts are associated with being violated?
- What does violation feel like in your body?
- What do people do when they feel violated

Types of Violations: Based on what we've talked about, the concept of violation can be pretty broad. To get a better sense of the nuance here, I want to try to break down the concept a little with you. With that in mind:

- What kinds of things can be violated?
- What are different kinds of violations?
    - How would you categorize these different types of situations that provoke feelings of violation?
- Does violation always involve someone else?

Example of Violation (BROAD): I would like you to try to think of a time where you felt violated.

- What was going through your mind?
- How did it feel?
    - What sensations did you experience in your body?
- What did you do in the situation?
    - Did you do anything to avoid or neutralize the feeling?
    - Was there anything you felt the urge to do but didn't?

Violation of the Self: So far, we've talked about a variety of different kinds of violation. Now I would like to zero in specifically on violation of the sense of self.

- How can your sense of self be violated?
- What kinds of situations would cause this?
- What does it feel like for one's sense of self to be violated?
    - What kinds of thoughts does this cause?
    - What does this make you want to do?
    - What does it feel like in your body?
    - What are the things it might say about you?
        - Are there some things that it doesn't say about you but sometimes it feels like it does? What are they?

Example of Violation (of the SELF): Oftentimes people have an idea of the type of person they are, in terms of the things that they stand for, the qualities they possess, and the values they hold. Can you think of a time where this sense of how you see yourself was violated?

- What was going through your mind?
- What are the things it might say about you?
    - Are there some things that it doesn't say about you but sometimes it feels like it does? What are they?
- How did it feel?
    - What sensations did you experience in your body?
- What did you do in the situation?
    - Did you do anything to avoid or neutralize the feeling?
    - Was there anything you felt the urge to do but didn't?

APPENDIX B: Final 22-item VAM (Study 2)

A violation refers to a situation where someone's boundaries have been crossed. This can be a physical boundary, a mental boundary, an emotional boundary, or a moral boundary, and can be a result of others' actions or your own actions. Violations can also vary in intensity, ranging from instances that are relatively mild, happen quite frequently, and have a minimal impact on one's life, to those that are extreme, rare, and greatly impact one's wellbeing and functioning.

Please think of a time when you experienced a violation of any kind. Once you have a violation in mind, please proceed with the following questions.

The following statements refer to thoughts some people have after experiencing a violation. **Please take a moment to recall the violation that came to mind when reading the instructions and rate the degree to which you agree/disagree with each of these statements**.

	0 Disagree Strongly	1 Disagree	2 Neutral	3 Agree	4 Agree Strongly
1. If my values were strong enough, they wouldn't be violated.					
2. My safety doesn't matter anymore.					
3. Past violations could have been avoided if I were more clever.					
4. One violation makes everything feel tainted.					
5. Once you have been violated, you cannot be unviolated.					
6. I grieve the loss of the person I could have been if I had not been violated.					
7. When a boundary of mine is violated, it taints my entire being.					
8. Past violations could have been avoided if I were less careless.					
9. Past violations could have been avoided if I were stronger.					
10. I am forever tainted by my past violations.					
11. There are potential violations around every corner.					
12. If I am made to feel weak, I will never be strong again.					
13. If a boundary of mine was crossed, it means I must not have spoken up enough.					

14. It's impossible to know who is capable of violating you.					
15. If someone I trust crosses one of my boundaries, it means anyone is capable of crossing one of my boundaries.					
16. I must have done something to invite the violation.					
17. Past violations could have been avoided if I were more self-assured.					
18. Nobody can be written off as completely "safe".					
19. Being violated forever blemishes me.					
20. I have nothing left that's worthy of protecting.					
21. Once my sense of worthiness has been violated, I can never reclaim it.					
22. I must never let my guard down.					

The VAM is freely available for public use.

Subscale Scoring Key:

Responsibility/Self-Blame Subscale: Items 1, 3, 8, 9, 13, 16, 17

Permanence Subscale: Items 4, 5, 6, 7, 10, 19

Mistrust Subscale: Items 11, 14, 15, 18, 22

Self-Worth Subscale: Items 2, 12, 20, 21

APPENDIX C: Geomin Rotated Factor Loadings for Full Scale Four-Factor Solution and Reason for Item Deletion

#	Item	R/SB	P	M	SW
1	Past violation makes me feel weak.‡	0.433*	0.078	0.063	0.134*
2	Anyone could be a violator. ‡	0.043	-0.095	0.394*	-0.045
3	If my values were strong enough, they wouldn't be violated.	-0.162	0.540*	-0.141	0.321*
4	My safety doesn't matter anymore.	0.082	0.107	-0.104	0.516*
5	No matter how much time passes, old violations never go away. ‡	0.393*	-0.107	0.273*	0.145
6	I am worth less than others after being violated. ‡	0.259*	0.186*	-0.104	0.512*
7	Past violations could have been avoided if I were more clever.	-0.009	0.780*	-0.027	0.037
8	The world is full of people only looking out for their own self-interest. ‡‡	0.004	0.107	0.533*	0.076
9	Sometimes I wonder whether a part of me might have wanted this to happen. ‡	0.093	0.439*	0.141	0.079
10	If I am violated and others are not, I question whether my personality is to blame. †	0.364*	0.443*	0.113	0.076
11	Only weak people get violated. ‡	0.065	0.316*	-0.114	0.453*
12	One violation makes everything feel tainted.	0.600*	-0.047	0.155*	0.156*
13	Once you have been violated, you cannot be unviolated.	0.475*	-0.06	0.112	0.118
14	I can't trust my reaction to the violation. ‡	0.398*	0.236*	0.128	0.149*
15	Others forever look at me differently after I have been violated. ‡	0.333*	0.119	0.119	0.263*
16	I often wonder whether my naiveté contributed to my past experiences of violation. †	0.367*	0.546*	0.098	-0.095
17	I grieve the loss of the person I could have been if I had not been violated.	0.500*	0.131	-0.039	0.117
18	When a boundary of mine is violated, it taints my entire being.	0.595*	0.048	0.045	0.220*
19	I now see myself through my violator's eyes. ‡	0.208*	0.122	0.018	0.437*
20	Past violations could have been avoided if I were less careless.	0.007	0.677*	0.114	0.068
21	Past violations could have been avoided if I were stronger.	0.082	0.693*	0.003	0.059
22	I am forever tainted by my past violations.	0.614*	0.01	0.051	0.209*
23	The idea of losing my agency is very distressing. ‡	0.422*	0.059	0.209*	-0.099
24	There are potential violations around every corner.	0.159	0.043	0.560*	-0.077
25	Losing one of my rights makes me feel like I've lost all control. ‡	0.415*	-0.008	0.238*	0.097

26	Violating thoughts are like intruders from which the mind must be protected. ‡	0.363*	0.076	0.190*	0.122
27	If I am made to feel weak, I will never be strong again.	0.067	0.13	0.059	0.531*
28	If a boundary of mine was crossed, it means I must not have spoken up enough.	-0.059	0.576*	0.145*	0.154
29	Others' comments about who I am can lead me to question my own sense of self. ‡	0.279*	0.293*	0.238*	-0.055
30	Strong people cannot be violated.†	-0.086	0.344*	-0.112	0.424*
31	Having been violated makes me feel weak and small. ‡	0.466*	0.216*	0.16	0.041
32	I often doubt whether my reactions to the violation are appropriate. ‡	0.328*	0.383*	0.118	-0.069
33	If there is a disconnect between how a violator sees me and how I see myself, I believe the violator. ‡	0.129	0.207*	0.127	0.455*
34	When I'm forced to choose something I don't want, it feels like I'm living someone else's life. ‡	0.231*	0.170*	0.260*	0.055
35	Past violations make me hypervigilant to protect myself against future violations. ‡	0.265*	0.037	0.457*	-0.04
36	If I do something that violates a value of mine, it means I am weak-willed. ‡	0.093	0.336*	0.249*	0.210*
37	It is critically important that I retain my freedom at all times. ‡	0.051	-0.015	0.436*	-0.132
38	It's impossible to know who is capable of violating you.	0.087	0.025	0.492*	-0.041
39	If someone I trust crosses one of my boundaries, it means anyone is capable of crossing one of my boundaries.	0.064	0.155*	0.555*	-0.106
40	Past violation makes me feel stupid. †	0.322*	0.420*	0.078	0.063
41	I must have done something to invite the violation.	0.091	0.668*	0.008	0.095
42	If someone violates my trust, it can never be repaired. ‡	0.013	-0.064	0.469*	0.205*
43	I don't feel safe in the world after experiencing a violation.†	0.284*	0.003	0.426*	0.168*
44	I have no power, things are just happening to me. ‡	0.169*	0.032	0.251*	0.448*
45	Past violations could have been avoided if I were more self-assured.	-0.016	0.668*	0.073	0.180*
46	Nobody can be written off as completely "safe".	0.105	-0.04	0.582*	-0.061
47	After experiencing a violation, it is important to keep all people at arm's length.†	-0.142	0.068	0.521*	0.453*
48	When I do something that contradicts a value of mine, it makes me question who I am. ‡	0.206	0.179*	0.310*	-0.033
49	Being violated forever blemishes me.	0.518*	0.056	0.129*	0.330*
50	If someone violates my trust, I lose trust in all people. †	0.012	-0.085	0.413*	0.531*
51	Past violation makes me feel careless. ‡	0.154	0.384*	0.124	0.225*

52	I have nothing left that's worthy of protecting.	0.06	-0.036	0.016	0.735*
53	Once my sense of worthiness has been violated, I can never reclaim it.	0.159	0.019	0.086	0.640*
54	Past violation makes me feel unworthy. †	0.377*	0.125	0.081	0.379*
55	I must never let my guard down.	-0.127	0.045	0.605*	0.229*

Note. R/SB = Responsibility/Self-Blame Subscale, P = Permanence Subscale, M = Mistrust Subscale, SW = Self-Worth Subscale. Light grey boxes indicate the factor to which the item belongs. Dark grey rows indicate items ultimately removed from the measure. Decisions about item removal was based on factor loadings from this initial EFA, as well as subsequent EFAs run with items removed in a stepwise fashion.
† = item removed due to cross-loading,
‡ = item removed due to low loading (i.e., < .45 on any factor),
‡‡ = item removed due to confusing wordin

APPENDIX D: Bogus Personality Measure (Study 3)

Personality traits have been linked with many different outcomes relevant to wellbeing. That said, the tools that exist don't adequately tap into constructs specifically relevant to psychopathology.

On the next pages you will be asked to complete a new personality measure we have developed to tap into these aspects of personality.

After completing it, you will be given a short description of your most notable qualities, as compared to those who have completed the measure already.

Moral Foundations Questionnaire (Graham, et al., 2008)

Please read the following sentences and indicate your agreement or disagreement:

[0]	[1]	[2]	[3]	[4]	[5]
Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree

1. Compassion for those who are suffering is the most crucial virtue.
2. When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
3. I am proud of my country's history.
4. Respect for authority is something all children need to learn.
5. People should not do things that are disgusting, even if no one is harmed.
6. It is better to do good than to do bad.
7. One of the worst things a person could do is hurt a defenseless animal.
8. Justice is the most important requirement for a society.
9. People should be loyal to their family members, even when they have done something wrong.
10. Men and women each have different roles to play in society.
11. I would call some acts wrong on the grounds that they are unnatural.
12. It can never be right to kill a human being.
13. I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.
14. It is more important to be a team player than to express oneself.
15. If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.
16. Chastity is an important and valuable virtue.

APPENDIX E: False Personality Feedback (Study 3)

Most Notable Quality:
Strong Moral Compass

Percentile Rank:
Your responses fell in the top 5th percentile of respondents on the morality subscale.

Personality Profile:
Your responses were in line with the "Do Gooder" profile. You have a strong sense of right and wrong, and highly value acting in accordance with these values. Your ethical mindset guides many of your actions and choices in your daily life.

APPENDIX F: Ethics Approval Certificates

CERTIFICATION OF ETHICAL ACCEPTABILITY
FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant:	Sandra Krause
Department:	Faculty of Arts and Science\Psychology
Agency:	Canadian Institutes of Health Research
Title of Project:	A transdiagnostic approach to the measurement and treatment of mental contamination
Certification Number:	30013995

Valid From: May 11, 2021 To: May 10, 2022

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Richard DeMont

_____

Dr. Richard DeMont, Chair, University Human Research Ethics Committee

CERTIFICATION OF ETHICAL ACCEPTABILITY
FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant:	Sandra Krause
Department:	Faculty of Arts and Science\Psychology
Agency:	Canadian Institutes of Health Research
Title of Project:	A transdiagnostic approach to the measurement and treatment of mental contamination
Certification Number:	30013995

Valid From: April 06, 2022 To: April 05, 2023

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Richard DeMont

_____

Dr. Richard DeMont, Chair, University Human Research Ethics Committee

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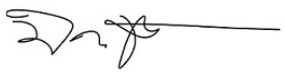
Title of Project:	A transdiagnostic approach to the measurement and treatment of mental contamination
Certification Number:	30013995

Valid From: April 06, 2023 To: April 05, 2024

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.



Dr. David Waddington, Chair, University Human Research Ethics Committee

CERTIFICATION OF ETHICAL ACCEPTABILITY
FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant:	Sandra Krause
Department:	Faculty of Arts and Science\Psychology
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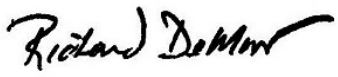
Certification Number:	30013995

Valid From: April 06, 2024 To: April 05, 2025

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.



Dr. Richard DeMont, Chair, University Human Research Ethics Committee

APPENDIX G: Study Consent Forms

Study 1: Consent Form

INFORMATION AND CONSENT FORM

Study Title: A transdiagnostic approach to the measurement and treatment of mental contamination
Researcher: Sandra Krause, M.A.
Researcher's Contact Information: s_krause@live.concordia.ca
Faculty Supervisor: Adam S. Radomsky, Ph.D.
Faculty Supervisor's Contact Information: adam.radomsky@concordia.ca
Source of funding for the study: Canadian Institutes of Health Research (CIHR)

You are being invited to participate in the research study mentioned above. This form provides information about what participating would mean. Please read it carefully before deciding if you want to participate or not. If there is anything you do not understand, or if you want more information, please ask the researcher.

A. PURPOSE

The purpose of the research is to conduct an investigation of perceptions of violation in the context of mental contamination (i.e., feelings of internal dirtiness that arise in the absence of any direct contact with a contaminant), to better understand what thoughts relating to violation make feelings of mental contamination better/worse.

B. PROCEDURES

If you participate, you will be asked various questions related to perceptions about violation and mental contamination. Additionally, you will be asked to fill out some questionnaires.

In total, participating in this study will take approximately 90 minutes.

The interview will be video recorded and will only be made available to members of Professor Radomsky's research team.

C. RISKS AND BENEFITS

You might face certain risks by participating in this research. These risks include: discomfort when thinking about some topics and/or when answering questions of a sensitive nature (e.g., related to anxiety, trauma, and/or low mood), or when talking about potentially sensitive areas of your life that may be difficult for you to discuss. We expect that any discomfort you may experience will be mild and temporary; please inform the experimenter if you feel in any way uncomfortable.

Potential benefits for your participation include: the opportunity to gain first-hand insight into how research is conducted in psychology. Further, you will have made a direct contribution to the development of psychological treatments through your participation.

D. CONFIDENTIALITY

By participating, you agree to let researchers have access to the data you will have provided during the study. This information will be obtained from the questionnaires you will complete (e.g., symptoms you may be experiencing), recordings, and the ratings you provide.

We will not allow anyone to access the information, except people directly involved in conducting the research. We will only use the information for the purposes of the research described in this form.

The information gathered will be coded. That means that the information will be identified by a code. The researcher will have a list that links the code to your name, which will be kept separate from all study data, under lock and key.

By agreeing to participate in this study, you are consenting to be video-recorded. These recordings will only be accessible to people directly involved in conducting the research. These recordings will only be used for the purposes of the research described in this form.

All information obtained will be kept strictly confidential and will be on password protected files for a period of seven years after publication, after which time all identifying information will be destroyed and all other data will be archived indefinitely.

We intend to publish the results of the research. However, it will not be possible to identify you in the published results. Select quotes from interviews may be included in the final published results. However, all included quotes will be anonymized, without any link to demographic characteristics of the speaker.

In certain situations, we might be legally required to disclose the information that you provide. This includes situations where you disclose intentions to harm yourself or others, or knowledge of child abuse/neglect, or a subpoena or related court order is issued for the data being collected in this study. If this kind of situation arises, we will disclose the information as required by law, despite what is written in this form.

E. CONDITIONS OF PARTICIPATION

You do not have to participate in this research. It is purely your decision. If you do participate, you can stop at any time. You can also ask that the information you provided not be used, and your choice will be respected. If you choose to withdraw from the study, your data will be destroyed. If you decide that you don't want us to use your information, you must tell the researcher at any time within one week following your participation. After that time, it is not possible to have your information omitted from analysis.

As a compensatory indemnity for participating in this research, you will receive $50. If you wish to withdraw before the end of the research, you will receive the same compensation anyway.

To make sure that research money is being spent properly, auditors from Concordia or outside will have access to a coded list of participants. It will not be possible to identify you from this list.

There are no negative consequences for not participating, stopping in the middle, or asking us not to use your information.

F. PARTICIPANT'S DECLARATION

I have read and understood this form. I have had the chance to ask questions and any questions have been answered. I agree to participate in this research under the conditions described.

NAME (please print) _____

SIGNATURE _____

DATE _____

If you have questions about the scientific or scholarly aspects of this research, please contact the researcher. Their contact information is on page 1. You may also contact their faculty supervisor.

If you have concerns about ethical issues in this research, please contact the Manager, Research Ethics, Concordia University, 514.848.2424 ex. 7481 or oor.ethics@concordia.ca.

Study 1: Verbal Consent Script

Hi. Thanks so much for signing up to participate. My name is [EXPERIMENTER NAME], and I am a [ROLE] here in the Anxiety and Obsessive- Compulsive Disorders Laboratory.
Before we begin, I'll tell you a bit about today's study.

The study that you are about to participate in consists of an interview aimed at understanding the concept of violation. In other words, we are interested in understanding instances where your sense of self, moral code, or body were treated in ways that went against your worldview of the way things should be. During the interview, you will be asked numerous questions related to the meaning of violation to you, as well as your experience of instances of violation, and the things you felt and thought about in those instances.

The interview will be recorded and will only be made available to members of Professor Radomsky's research team directly involved in this research study. The only instances where I would be legally obligated to break confidentiality is if there is reason to believe there is imminent risk of harm to yourself or others, or if you disclose instances of child abuse. Otherwise, everything discussed today will be kept completely confidential. Anonymized quotes from the interview may be included in the final publication of the research study. However, the quotes will be completely anonymized and all identifying information will be removed from any quotes included.

The study will consist of three parts. The first part is the eligibility assessment, where you will be asked about different types of symptoms you've been experiencing recently. If you are deemed eligible to participate, we will then go on to the interview portion of the study, where we will discuss the concept of violation. Finally, after the interview, you will asked to fill out some questionaries online.

The eligibility assessment should take about half an hour and the interview/questionnaires should take approximately an hour. If you are eligible to take part in the whole study, you will receive $50 for your participation. Please be informed that you may withdraw your participation at any time without any negative consequences whatsoever.

Do you have any questions before we begin?

Do you consent to participating today in light of the information in the consent form and the information I just provided?

Study 2: Consent Form

INFORMATION AND CONSENT FORM

Study Title: Validating a new measure of perceptions of violation
Researcher: Sandra Krause, M.A.
Researcher's Contact Information: s_krause@live.concordia.ca
Faculty Supervisor: Adam S. Radomsky, Ph.D.
Faculty Supervisor's Contact Information: adam.radomsky@concordia.ca
Source of funding for the study: Canadian Institutes of Health Research (CIHR)

You are being invited to participate in the research study mentioned above. This form provides information about what participating would mean. Please read it carefully before deciding if you want to participate or not. If there is anything you do not understand, or if you want more information, please ask the researcher.

A. PURPOSE

The purpose of the research is to validate a new questionnaire designed to measure the way people think and feel about different kinds of violations.

B. PROCEDURES

If you agree to participate in this study, you will be asked to complete a questionnaire package. The study should take approximately 90 minutes to complete and will be completed online. These questionnaires ask no information about your name and will not be connected in any way with your contact details. The data collected from these questionnaires will be hosted on a Concordia University server, but no identifying information will be linked to the questionnaires or hosted on the server. Finally, you will be provided with a debriefing form highlighting additional details of the research study and further readings and resources.

C. RISKS AND BENEFITS

There are no risks associated with your participation in this study.

Potential benefits of your participation include: the opportunity to gain first-hand insight into how research is conducted in psychology, making a direct contribution to the development of new psychological tools through your participation

D. CONFIDENTIALITY

By participating, you agree to let researchers have access to the data you will have provided during the study. This information will be obtained from the questionnaires you will complete.

We will not allow anyone to access the information, except people directly involved in conducting the research. We will only use the information for the purposes of the research described in this form.

The information gathered will not be linked to you in any way.

All information obtained will be kept strictly confidential and will be on password protected files for a period of seven years after publication, after which time all identifying information will be destroyed and all other data will be archived indefinitely.

We intend to publish the results of the research. However, it will not be possible to identify you in the published results.

E. CONDITIONS OF PARTICIPATION

You do not have to participate in this research. It is purely your decision. If you do participate, you can stop at any time. You can also ask that the information you provided not be used, and your choice will be respected. If you choose to withdraw from the study, your data will be destroyed. If you decide that you don't want us to use your information, you must tell the researcher at any time within one week following your participation. After that time, it is not possible to have your information omitted from analysis.

As a compensatory indemnity for participating in this research, you will receive 1.5 points towards the participant pool OR an entry ballot into our cash draw for $250 (odds of winning vary by year, based on number of participants who enter), held annually between August and September following your participation. If you wish to withdraw before the end of the research, you will receive the same compensation anyway.

To make sure that research money is being spent properly, auditors from Concordia or outside will have access to a coded list of participants. It will not be possible to identify you from this list.

There are no negative consequences for not participating, stopping in the middle, or asking us not to use your information.

F. PARTICIPANT'S DECLARATION

I have read and understood this form. I have had the chance to ask questions and any questions have been answered. I agree to participate in this research under the conditions described.

By clicking on the “I agree” button below, I confirm that I agree to participate in the study described above.

If you have questions about the scientific or scholarly aspects of this research, please contact the researcher. Their contact information is on page 1. You may also contact their faculty supervisor.

If you have concerns about ethical issues in this research, please contact the Manager, Research Ethics, Concordia University, 514.848.2424 ex. 7481 or oor.ethics@concordia.ca.

Study 3: Consent Form

INFORMATION AND CONSENT FORM

Study Title: Investigating the relationship between personality and memory using a novel personality measure
Researcher: Sandra Krause, M.A.
Researcher's Contact Information: s_krause@live.concordia.ca
Faculty Supervisor: Adam S. Radomsky, Ph.D.
Faculty Supervisor's Contact Information: adam.radomsky@concordia.ca
Source of funding for the study: Canadian Institutes of Health Research (CIHR)

You are being invited to participate in the research study mentioned above. This form provides information about what participating would mean. Please read it carefully before deciding if you want to participate or not. If there is anything you do not understand, or if you want more information, please ask the researcher.

A. PURPOSE

The purpose of the research is to assess the relationship between different personality types and the ability to recall events from the past using a new measure of personality.

B. PROCEDURES

If you agree to participate in this study, you will be asked to press agree at the bottom of this page, complete a personality measure and a memory recall writing task and then complete a battery of questionnaires. The study should take approximately 60 minutes to complete and will be completed online.

C. RISKS AND BENEFITS

To the best of our knowledge, there are no risks associated with your participation in this study. If you experience distress at any point, let the experimenter know immediately.

Potential benefits for you participation include the potential to gain first-hand insight into how research is conducted in psychology. Further, you will have made a direct contribution to the development of psychological treatments through your participation.

D. CONFIDENTIALITY

By participating, you agree to let researchers have access to the data you will have provided during the study. This information will be obtained from the questionnaires you will complete and the writing sample you provide.

We will not allow anyone to access the information, except people directly involved in conducting the research. We will only use the information for the purposes of the research described in this form.

The information gathered will not be linked to you in any way.

All information obtained will be kept strictly confidential and will be on password protected files for a period of seven years after publication, after which time all identifying information will be destroyed and all other data will be archived indefinitely.

We intend to publish the results of the research. However, it will not be possible to identify you in the published results.

E. CONDITIONS OF PARTICIPATION

You do not have to participate in this research. It is purely your decision. If you do participate, you can stop at any time. You can also ask that the information you provided not be used, and your choice will be respected. If you choose to withdraw from the study, your data will be destroyed. If you decide that you don't want us to use your information, you must tell the researcher at any time within one week following your participation. After that time, it is not possible to have your information omitted from analysis.

As a compensatory indemnity for participating in this research, you will receive 1 point towards the participant pool OR an entry ballot into our cash draw for $250 (odds of winning vary by year, based on number of participants who enter), held annually between August and September following your participation. If you wish to withdraw before the end of the research, you will receive the same compensation anyway.

To make sure that research money is being spent properly, auditors from Concordia or outside will have access to a coded list of participants. It will not be possible to identify you from this list.

There are no negative consequences for not participating, stopping in the middle, or asking us not to use your information.

F. PARTICIPANT'S DECLARATION

I have read and understood this form. I have had the chance to ask questions and any questions have been answered. I agree to participate in this research under the conditions described.

By clicking on the “I agree” button below, I confirm that I agree to participate in the study described above.

If you have questions about the scientific or scholarly aspects of this research, please contact the researcher. Their contact information is on page 1. You may also contact their faculty supervisor.

If you have concerns about ethical issues in this research, please contact the Manager, Research Ethics, Concordia University, 514.848.2424 ex. 7481 or oor.ethics@concordia.ca.

Study 3: Post-Debriefing Consent Form

Given the nature of the experimental manipulation, it was necessary to provide you with incomplete information about the purpose of the study at the outset of this study. Specifically, you were told we were examining the relationship between personality and memory. Additionally, you were given false feedback about your responses on a personality measure. This deception was necessary to ensure the experimental manipulation was successful. This allowed us to measure the causal impact of violating individuals sense of self on mental contamination.

Given the use of deception, an additional consent form is required. By clicking "I consent" below, you acknowledge that you have been made aware of the deception involved in this study and remain willing to have your data and video recording included in the results given this new information. Further, you agree that you will not discuss the aspects of this deception, or the true intent of the study with anyone outside of those immediately involved in the study.

If you would not like your data to be included in the study in light of this deception, please click "I do not consent" below and your data will be destroyed.