

ABSTRACT

Measuring State Mental Contamination and its Effect on Social Distance

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Mental contamination is a contamination fear that is associated with feeling dirty without direct contact to a contaminant and is often accompanied by negative emotions. Little research has explored mental contamination outside of a clinical population or applied it to social psychological concepts. The purpose of the current study was to develop an experimental manipulation and measurement for state mental contamination, and apply them to explore the role of state mental contamination on social distance toward outgroups. Participants of these studies were adults recruited from the internet. The first experiment established the manipulability and measurement of mental contamination, and the second experiment showed that state mental contamination had little to no effect on social distance toward outgroups. Limitations and directions for future research are discussed.

Measuring State Mental Contamination and its Effect on Social Distance

by

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Through the process of seeing this thesis project from start to finish, I have gained immense knowledge about the academic topics involved, but also the research process and writing. Many decisions, both small and large, were made in this process, with the realization that there is no single correct way to research and write. Through this, I have had to master the arts of patience, perseverance, and revision. I would like to express my gratitude to my advisors, Dr. Fergus and Dr. Rowatt, whose knowledge, guidance, and resources aided in the completion of this research. These faculty members of Baylor University gave me invaluable time and direction on this writing, yet challenged me, allowing this document to be my own. I appreciate their part in growing me into a better academic and author.

CHAPTER ONE

Introduction

Mental contamination is a contamination fear that is associated with feeling dirty without direct contact to a contaminant. The experience of mental contamination has mainly been studied as a symptom of obsessive compulsive disorder or post-traumatic stress disorder, but has more recently been studied in the general population. Experimental research of mental contamination for the general population needs expansion, including useful methods for evoking a state of mental contamination and a short, self-report measurement of the experience. The first study of this manuscript sought to validate an experimental manipulation of mental contamination using scenarios with high disgust imagery. A self-report measure was also created, mirroring a previously and widely used measure for trait, or general propensity for, mental contamination. This measure for state mental contamination was also used and validated in the first study. Internet respondents participated in the first study, and the results indicated validity for the experimental manipulation and measurement of state mental contamination.

The experience of mental contamination is often accompanied by negative appraisals and negative emotions, such as disgust. While disgust is a widely researched emotion in social psychology, mental contamination, conceptualized as a facet of disgust, has yet to be applied to social psychological research. Following the adequate manipulation and measurement of state mental contamination in the first study, the second study of this manuscript sought to evoke mental contamination and explore its

role in a disgust-related phenomenon: prejudice. The same scenarios from the first study were used to evoke mental contamination in participants, who were then asked to express their desired social distance from various social group members. While disgust marginally predicted more social distance toward individuals who are homeless and individuals who are very poor, state mental contamination did not significantly predict expressed social distance toward any group members.

The current manuscript reviews research on mental contamination and the novelty and potential for applying mental contamination to social psychological research. Following the main literature review, the first study, titled “The Manipulation and Measurement of Mental Contamination,” has a short introduction, followed by methods, results, and a short discussion. The first study is followed by the second study, titled “Mental Contamination and Social Distance,” and also contains short introduction, methods, results, and short discussion sections. Finally, conclusions, including limitations of the current experiments and directions for future research, are discussed.

CHAPTER TWO

Literature Review

Understanding Mental Contamination

Mental contamination is a contamination fear characterized by feeling dirty or unclean, not by direct physical contamination, but by looking at, imagining, or thinking about something or someone deemed unclean (Rachman, 2004). The individual's feeling of dirtiness can sometimes be physical, and a person experiencing mental contamination may have urges to physically wash, even though no physical contamination has taken place. The feelings of dirtiness can also be unidentifiable or internal, and, often, the feelings of contamination are accompanied by negative emotions (Fairbrother, Newth, & Rachman, 2005).

Mental contamination has primarily been studied in the clinical realm among those who have Obsessive Compulsive Disorder (OCD), since contamination fears are a common symptom of OCD (Coughtrey, Shafran, Knibbs, & Rachman, 2012). Another clinical population where mental contamination is relevant is in those with Post-Traumatic Stress Disorder (PTSD), or those who have experienced a traumatic event. For example, mental contamination has been studied in women who have experienced sexual trauma (Badour, Feldner, Blumenthal, & Bujarshi, 2013, Fairbrother & Rachman, 2004), and this research suggested that these women experienced feelings of dirtiness just by remembering their past trauma, and that the intensity of these feelings resembled a type of situational OCD or PTSD (Fairbrother & Rachman, 2004).

In addition, mental contamination is something that people in non-clinical populations can experience. Female and male undergraduate students have been studied after experimental conditions, showing that average populations can experience mental contamination under certain morally or physically disgusting circumstances (Elliott & Radomsky, 2009, Elliott & Radomsky, 2012, Lee et al., 2013, Rachman, Radomsky, Elliott, & Zysk, 2012). Furthermore, measures of trait mental contamination suggest that people show variation in propensity for mental contamination without necessarily having OCD (Radomsky, Rachman, Shafran, Coughtrey, & Barber, 2014). In sum, it is not uncommon for all people to experience mental contamination under certain conditions, or even periodically over time.

While mental contamination research is in its relative infancy, more interest and facilitation of this research is critical because of evidence suggesting that mental contamination is relevant to more than just clinical populations and disorders. Mental contamination is important to study in the general population because the experience of this negative internal state could lead to negative appraisals and behavior that may extend to various contexts, such as social interaction. If an individual experiences mental contamination and its accompanying negative emotions and thoughts, he or she may appraise the world differently, and seek to avoid potentially aversive situations or people in order to escape the unpleasant feelings associated with mental contamination. State mental contamination could influence individual experiences, but specific experimental manipulation and applications of mental contamination need further exploration.

Manipulating and Measuring State Mental Contamination

The diverse constellation of symptoms and precursors to mental contamination make the manipulation of mental contamination difficult to conceptualize, but the most reliable manipulation of mental contamination often involves some sort of disgusting stimuli. Negative emotion, but especially disgust, has been shown to be closely related to mental contamination (Badour, Ojserkis, McKay, & Feldner, 2014, Fairbrother et al., 2005, Rachman et al., 2012, Radomsky et al., 2014). While mental contamination and disgust are proposed as two distinct constructs, they overlap. For example, Fairbrother and Rachman (2004) suggest that disgust can occur without mental contamination, but that mental contamination cannot occur without the emotion of disgust. Therefore, manipulating mental contamination has been approached under the assumption that the manipulation of disgust can also affect mental contamination.

While stimuli for mental contamination have remained relatively limited in research, it may be possible that relatively common situations could evoke mental contamination. For some, mental contamination can be manipulated through imagining a “dirty,” or unwanted, kiss (Elliott & Radomsky, 2009), imagining vomit, or being around a bucket of fake vomit (Lee et al., 2013). The “dirty kiss” paradigm, which capitalizes on sexual disgust, has been the most used tool for studying mental contamination, but other paradigms that can be relatable to both men and women need more development (Elliott & Radomsky, 2009). Furthermore, since these paradigms have not been tested alongside each other, it remains unknown if it may be possible for different types of disgust (e.g., physical or moral) to better evoke mental contamination. Because disgust always occurs with mental contamination, but mental contamination does not always occur with disgust

(Fairbrother & Rachman, 2004), closer attention to the manipulation of mental contamination is necessary for better exploration of this variable among the general population. The first study of this document seeks to validate new paradigms that can be used in mental contamination research and explore whether physical or moral disgust differentially engender mental contamination.

In addition to new paradigms, the measurement of state mental contamination in experimental research needs expansion. While trait mental contamination is measured with a reliable self-report questionnaire, the Vancouver Obsessive-Compulsive Inventory-Mental Contamination Scale (VOCI-MC, Radomsky et al., 2014), state mental contamination does not have a standard measure. Previous research has used behavioral indicators of mental contamination such as hand washing or rinsing out the mouth (e.g., Elliott & Radomsky, 2009), or a more comprehensive measurement, called the Mental Contamination Record (MCR). The MCR was originally developed as a semistructured interview by Fairbrother and Rachamn (2004), but was also developed into a self-report measure by Herba and Rachman (2007). The questionnaire contains one item measuring feelings of dirtiness, items to report where the subject feels unclean (e.g. face, hands, internal), options for reporting how the subject would like to compensate for the feeling (e.g., wash hands, rinse out the mouth), and why the subject wants to compensate (e.g., to feel less anxious, to stop thinking about it). The questionnaire was added to by Elliott and Radomsky (2009) to include an item measuring feelings of violation and 12 items measuring different negative emotions (e.g., distressed, disgusted, guilty). There are also items built in as manipulation checks for the context of the research. Because of the structure of the MCR, each type of item of this questionnaire is meant to be explored

individually as a separate facet of mental contamination. However, a short self-report measure that could capture state mental contamination in a single summed score would have great utility and needs development to facilitate standardized research in this area, especially in settings where time and resources may be limited.

Of primary importance in the measurement of mental contamination may be the “feeling dirty” aspect of mental contamination and the negative emotions and appraisals specifically tied to it. One of the often-used measures of trait mental contamination, the VOICI-MC (Radomsky et al., 2014), focuses on this aspect of mental contamination. Example items from the VOICI-MC include "Often I look clean, but feel dirty," "I often experience unwanted and upsetting thoughts about dirtiness," "Unwanted and repugnant thoughts often make me feel contaminated or dirty," and "Often when I feel dirty or contaminated, I also feel guilty or ashamed." The items of the VOICI-MC target some variety in mental contamination, such as emotions, worry, and desire to compensate, but do not attempt to measure specific locations of dirtiness, urges to compensate, or reasons for compensating. In addition, all of the items target the emotions and appraisals as they relate to feelings of dirtiness. This may be the most important aspect to focus on in a shortened measure because the "feeling dirty" aspect of mental contamination is a hallmark, definitional characteristic of mental contamination (Rachman, 2004). If feeling dirty, overall, without direct contamination, is a necessary symptom of mental contamination, then a self-report measure targeting this aspect should have the same predictive validity as other state measures that are more in-depth. Once a paradigm and effective measurement are established, state mental contamination can be applied to other disgust-related concepts.

Mental Contamination in Prejudice

Because of mental contamination's overlap with disgust, it is probable that mental contamination is relevant to disgust-related phenomena. One such disgust-related concept is prejudice, where disgust activates avoidance toward out-group members that are potentially contaminating (i.e., via disease; Cottrell & Neuberg, 2005; Neuberg, Kenrick, & Schaller, 2011). Furthermore, prejudice is a cognitive and affective-based concept, with direct, physical contact with certain groups unnecessary for prejudice to develop. Contact could be indirect, or simply imagined, such as through the facilitation of culture and information that is passed through ingroup members. For example, Harris and Fiske (2006) used brain imaging and found that disgust and contempt were activated simply by looking at a picture of a man who was homeless.

While not all prejudice is disgust-based, certain groups may be more associated with disgust prejudice, such as those who are perceived to have either physically contaminating qualities or morally contaminating qualities (Cottrell & Neuberg, 2011). For example, those who are homeless and those who are poor and receiving welfare have been associated with disgust prejudice (Fiske, Cuddy, Glick, & Xu, 2002). Other groups could also be perceived with a sense of physical or moral disgust, such as those with mental illness, and those who are very wealthy. While these latter groups have not been experimentally associated with disgust, those with mental illness could be perceived as deserving of their illness due to personal fault (Rüsch, Todd, Bodenhausen, & Corrigan, 2010), which may indicate a moral disgust of lifestyle, and those who are very wealthy may trigger feelings of moral disgust since upper class individuals may be more likely to

cheat and act self-servingly (Dubois, Rucker, & Galinsky, 2015; Piff, Stancato, Côté, Mendoza-Denton, & Keltner, 2012). The wealthy outgroup has been associated with emotions of envy under the stereotype content model (Fiske et al., 2002), but the wealthy and mental illness groups both deserve further exploration as to if the prejudice also relates to disgust and mental contamination.

The second study of this document will examine state mental contamination's effect on social distance toward individuals who are homeless, very poor and receiving welfare, have mental illness, and are very wealthy. As a control group, social distance toward African Americans will also be assessed, since prejudice toward this group has typically been associated with emotions of fear and not disgust (Cottrell & Neuberg, 2011). Social distance is the extent to which a person wishes to either interact with or avoid individuals of certain groups (Link, Yang, Phelan, & Collins, 2004). Due to the link between mental contamination and contamination fear, a measure of social distance was thought to target feelings of avoidance of perceived contaminants.

Learning more about mental contamination in prejudice is a novel idea that deserves exploration because it is a way that disgust prejudice could be further broken down and understood, and could also lead to other applications of mental contamination. While disgust has been widely researched in social psychological concepts, no such exploration of mental contamination in the social psychology field has yet taken place. Mental contamination may be an important construct to the field of social psychology because just thinking about interacting with certain individuals could evoke negative emotional states that could lead to unjustified negative evaluations, avoidance, or discrimination toward an individual or group in the future. The current studies seek to

develop scenarios that evoke high amounts of mental contamination so that state mental contamination and its outcomes can be better studied. In addition, a new measure of mental contamination that specifically measures intensity of feelings of dirtiness will be used in order to show its merit as a self-report measure for state mental contamination. Finally, the validated experimental conditions and state mental contamination measure will be used to study whether or not state mental contamination influences prejudice as measured by social distance.

CHAPTER THREE

The Manipulation and Measurement of Mental Contamination

Introduction

The purpose of the current study is to explore how well imagined scenarios induce mental contamination in an internet sample. Both physically disgusting and morally disgusting scenarios will be used with the purpose of distinguishing which type of disgust may produce the most mental contamination. In addition, we seek to validate a measure of state mental contamination that hones in on the intensity of “feeling dirty” so that state mental contamination can be better measured in quantitative, experimental studies. It is hypothesized that the disgust scenarios will both produce more state mental contamination than the neutral scenario and that the measure of state mental contamination will show independence from trait mental contamination, general state anxiety, and negative affect. In addition to independence from trait mental contamination, trait mental contamination will also be examined as a moderator to determine if state mental contamination only occurs in those who have a propensity for mental contamination. Distinguishing state mental contamination in these ways will show that it has validity for certain circumstances over and above what can be studied with trait mental contamination, and that it is uniquely different from anxiety and negative affect. Anxiety may be part of mental contamination, as both are associated with OCD and PTSD, and negative affect may be related because negative emotions are associated with mental contamination, but anxiety and negative affect are not enough to encompass the

entire construct of mental contamination due to the specific aspects of contamination, urges to compensate, and feelings of violation and shame. Additionally, it is hypothesized that the new state mental contamination measure will show concurrent validity with another measure of feelings of dirtiness and predictive validity with number of places identified as “dirty,” urges to compensate, and feelings of violation.

Method

Participants

Participants were 121 adult users of Amazon’s Mechanical Turk (MTurk). All participants were located in the United States. Each subject had a minimum 95% acceptance rate on MTurk, increasing the quality of the data (Peer, Vosgerau, & Acquisti, 2014). Fifty-five percent of participants were male, and age of the sample ranged from 18 to 64 ($M = 34.37$, $SD = 10.88$). Seventy-seven percent self-identified as White, 7.4% as Asian, 5.8% as Black/African American, 5% as Hispanic/Latino, 2.5% as Native American, and 1.7% as Bi-racial/Multiracial. All participants had at least a high school degree or GED. The sample size was estimated using G*power (Faul, Erdfelder, Lang, & Buchner, 2007), expecting a moderate effect of each scenario on mental contamination and accounting for potential exclusion of cases as outliers or incomplete data ($\beta = .80$).

Measures

Imagined scenarios. Scenarios were developed under the premise that disgust is closely related to mental contamination; therefore inducing disgust should also induce state mental contamination. Because the effects of physical versus moral disgust have not

been closely studied, examples of both were used in the current study. In the first scenario, from Van Overveld, de Jong, and Peters (2009), the subject imagines coming upon a physically disgusting scene involving a physically ill man. In another scenario, adapted from Haidt, Koller, and Dias (1993) for the current study, the subject imagines a morally disgusting event of having his/her parents eat the dead family dog. Additionally, this scenario was developed to carry a sense of betrayal, a concept tied to mental contamination (Rachman, 2010). In the emotionally neutral (control) scenario from Van Overveld et al. (2009), the subject imagines taking a train to another city to visit a friend (see Appendix A).

State mental contamination. The State Mental Contamination Scale (SMCS) was developed for the current study using the VOICI-MC (Radomsky et al., 2014). The 20-item trait scale was adapted into a 15-item state scale by changing the language and dropping unadaptable items (i.e. “Certain people or places that make me feel dirty or contaminated leave everyone else completely unaffected.” See Appendix B for full scale). Items were rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*), where a higher score indicated more state mental contamination. The SMCS was found to have good internal consistency ($\alpha = .97$).

The MCR (Elliott & Radomsky, 2009) is a previously developed measure of state mental contamination. The current study used the scale containing one item measuring feelings of dirtiness, one item measuring feelings of disgust, options for reporting where the subject feels unclean, how the subject wishes to compensate for the feeling (i.e., washing), and why the subject wants to behave in this way. There were also 7 items built in as manipulation checks for visualizing the scenario and experiencing feelings of

violation and having done something wrong. The full scale also contains 12 items for negative emotion, but these items, were not used in the current study, as the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was included instead.

Trait mental contamination. The Vancouver Obsession-Compulsive Inventory-Mental Contamination Scale (VOCI-MC; Radomsky et al., 2014) is a measure of trait mental contamination, with 20 items rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate more trait propensity for mental contamination. Example items include “Some objects look clean, but feel dirty,” and “I often feel dirty or contaminated without knowing why.” This scale had good internal consistency ($\alpha = .97$). Radomsky et al., (2014) reports the validity of this measure across clinical and student populations.

Anxiety. The State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Gros, Antony, Simms, & McCabe, 2007) is a measure of anxiety that has a subscale for cognitive anxiety and a second subscale for somatic anxiety. The current study used the state version of the STICSA, which instructed participants to indicate their feelings “right now, at this very moment.” Responses to the 21 self-report items ranged from 1 (*not at all*) to 4 (*very much so*). Higher scores indicated higher state anxiety. The 10-item cognitive subscale, which measures symptoms of worry and obsession (e.g. “I feel agonized over my problems.”) showed excellent reliability ($\alpha = .94$). The 11-item somatic subscale, which measures symptoms of physiological stress (e.g. “My heart beats fast.”) also showed excellent reliability ($\alpha = .95$). The STICSA has good validity and strongly

correlates with other measures of anxiety and has a weaker correlation with measures of depression (Gros et al., 2007).

Positive and negative affect. The state version of the Positive and Negative Affect Schedule (PANAS; Watson, et al., 1988) was used, instructing participants to indicate their feelings “right now, that is, at the present moment.” Both the positive and negative affect scales were used. Responses to the 20 self-report items range from 1 (*very slightly or not at all*) to 5 (*extremely*) such that higher scores on either scale reflected more positive or negative affect. The 10 items from the positive affect scale (e.g. “interested” and “proud”) showed good reliability ($\alpha = .91$). The 10 items from the negative affect scale (e.g. “distressed” and “hostile”) also showed good reliability ($\alpha = .93$). Watson et al. (1988) detail this instrument’s validity across multiple samples.

Procedure

Participants were recruited on the internet from MTurk. Participants from this platform have been shown to give high quality data. Participation was restricted to those in the United State and who have a 95% approval rating, which increases data quality (Peer et al., 2014). Upon completion of the study, participants were paid a small amount (\$2.00 USD) in exchange for survey completion. Of note, this payment is on the high-end of the distribution of pay commonly associated with MTurk studies (see Buhrmester, Kwang, & Gosling, 2011), but was estimated based on length of the study and current minimum wage.

After consenting to participate, subjects were directed to relax in their chairs and vividly imagine one of three randomly assigned scenarios. They were asked to visualize

themselves as the main character in the scenario. After visualizing the scenario, participants took the SMCS and MCR in a randomized order. They then took the PANAS, STICSA, and VOICI-MC. Lastly, participants were debriefed about the specific purpose of the study.

Results

Upon preliminary inspection of the data, less than 1% of data were missing and were found to be missing completely at random ($\chi^2(2366) = 2422.731, p = .20$) and so were imputed using estimation maximization (EM). EM has been found to be an acceptable practice with low levels of data missing completely at random (Rubin, Witkiewitz, Andre, & Reilly, 2007; Scheffer, 2002). No multivariate outliers were detected, leaving 121 usable cases. The pattern of results remained consistent when cases with missing data were excluded listwise. In addition, participants reported ease of imaging the scenario and clarity/vividness of the visualization on visual analog scales ranging from 0 to 100 (high values indicated more ease and clarity/vividness of visualization). The mean scores, respectively, were 78.91 (SD = 23.78), and 83.81 (SD = 18.61) across the three conditions, indicating that the scenarios were easy to imagine and were clear.

Manipulation of State Mental Contamination and Disgust

An analysis of variance (ANOVA) showed that state mental contamination significantly differed based on scenario ($F(2, 118) = 14.83, p < .001$). Variances among the groups were unequal, ($F(2, 118) = 9.43, p < .001$), so Dunnett's C procedure was used to control Type I error. Post hoc analyses showed that the morally and physically

disgusting scenario evoked significantly more mental contamination than the neutral scenario. These comparisons are shown in Figure 3.1. The results held when including positive and negative affect, anxiety, and trait mental contamination as covariates ($F(2, 114) = 11.59, p < .001$). While state mental contamination differed across conditions, trait mental contamination ($F(2, 118) = 788.70, p = .069$), as well as somatic anxiety ($F(2, 118) = 1.84, p = .163$) did not. Additionally, cognitive anxiety differed across conditions ($F(2, 118) = 4.14, p = .018$), with the moral scenario evoking more cognitive anxiety than the neutral condition, and negative affect differed across conditions ($F(2, 118) = 6.85, p = .002$), with the moral scenario evoking more negative affect than the neutral condition. Importantly, trait mental contamination was not found to moderate state mental contamination in the physically disgusting condition versus control condition ($t = .47, p = .637, b^* = .04$), nor the morally disgusting condition versus control condition ($t = .79, p = .420, b^* = .08$).

An ANOVA also revealed that state disgust, as measured by a single item, significantly differed between each condition, $F(2, 118) = 98.42, p < .001$, see Figure 3.1. The effect of scenario on disgust held with mental contamination as a covariate ($F(2, 117) = 67.796, p < .001$), and state mental contamination significantly contributed to state disgust over and above scenario ($F(1, 117) = 37.990, p < .001$), showing independence of disgust from mental contamination. However, the effect of scenario on state mental contamination no longer held when disgust was added as a covariate ($F(2, 117) = .73, p = .484$), suggesting lack of independence of mental contamination from disgust.

Validation of the SMCS

The SMCS strongly correlated with the VOICI-MC, feelings of dirtiness (single item from the MCR), state disgust, number of physical places identified as “dirty”, and feelings of being violated. There was a moderate correlation between the SMCS and feelings of having done something wrong. See Table 3.1 for raw correlations. Cronbach’s alpha for the SMCS was .97, and inter-item correlations ranged from .51 to .86.

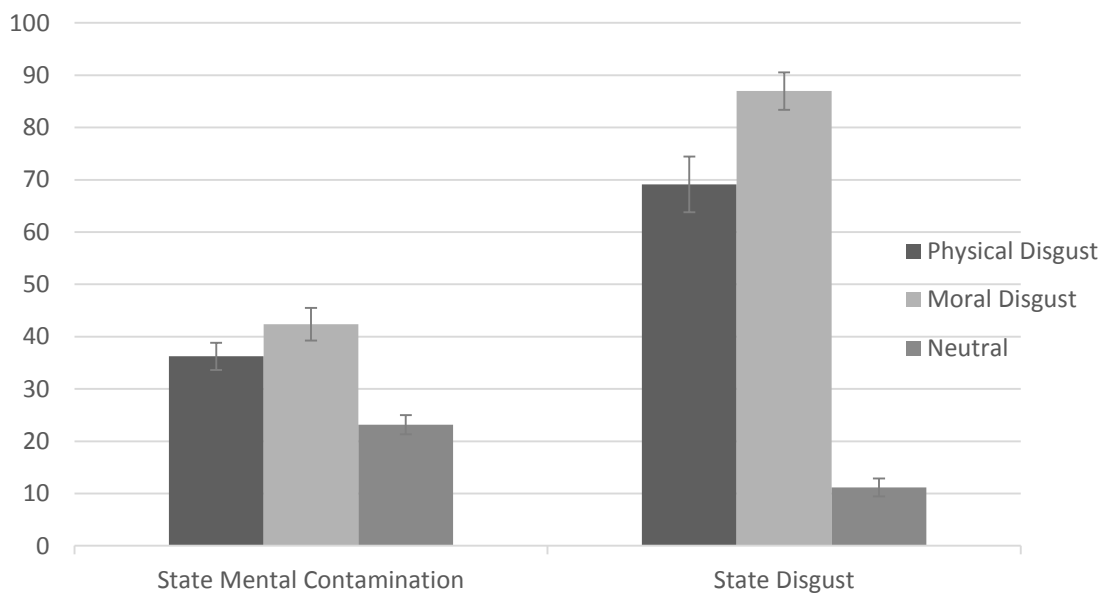


Figure 3.1. Mean of state mental contamination and disgust across conditions. State Mental Contamination scores ranged from 15 to 75, state disgust was rated on a scale from 0 to 100. Error bars denote standard errors.

The SMCS was a significant predictor of feelings of being violated, over and above feelings of dirtiness and state disgust, and also a significant predictor of urges to compensate. The SMCS was not a significant predictor over and above feelings of dirtiness as measured by a single item in the MCR, but was a significant predictor of number of places endorsed as unclean, over and above disgust ($b^* = .34, t = 3.27, p = .001$). The results of these hierarchical analyses are shown in Table 3.2.

Table 3.1

Raw Correlations between SMCS and Related Variables

Variable	1	2	3	4	5	6	7
1-SMCS	–						
2-VOCI-MC	.74	–					
3-Feelings of Dirtiness	.65	.54	–				
4-Places Identified as “dirty”	.47	.40	.56	–			
5-Feelings of Violation	.63	.43	.46	.31	–		
6-Feelings of Having Done Something Wrong	.28	.40	.23	.14	.40	–	
7-State Disgust	.62	.36	.65	.42	.78	.27	–

Note. $N = 121$, SMCS = State Mental Contamination Scale, VOCI-MC = Vancouver Obsession-Compulsive Inventory-Mental Contamination Scale. Variables 3, 5, 6, and 7 were measured with a single item from the Mental Contamination Record.

Table 3.2

Hierarchical Regression Analysis showing Incremental Validity of SMCS on Outcomes, Over State Disgust and Single Item Measure of Feelings of Dirtiness

Predictor	Outcomes								
	Urges for Neutralizing Behaviors			Feelings of Violation			Places Endorsed as Unclean		
	R ²	ΔR ²	Step 3 β	R ²	ΔR ²	Step 3 β	R ²	ΔR ²	Step 3 β
Step 1	.27	.27***		.61	.61***		.18	.18***	
State Disgust			-.01			.72			.04
Step 2	.49	.22***		.61	.00		.32	.12***	
Feelings of Dirtiness			.48			-.22			.43
Step 3	.55	.06***		.67	.05***		.34	.01	
SMCS			.33			.33			.16

Note. $N = 121$.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

The hypothesis that the physically and morally disgusting scenarios would evoke more mental contamination than the neutral scenario was supported. The experimental conditions evoked mental contamination independently of state anxiety, state emotion, and trait mental contamination. While the morally disgusting scenario evoked slightly

more disgust and mental contamination than the physically disgusting scenario, the difference was non-significant.

It is important to note that the scenarios did not predict mental contamination independently from state disgust; but rather the scenarios manipulated state disgust independently from mental contamination. This finding supports Fairbrother and Rachman's (2004) hypothesis that disgust can happen without mental contamination, but that mental contamination may only happen with the co-occurrence of disgust. This finding does not mean that mental contamination is disgust or that disgust is mental contamination; rather, the cognitive idea of mental contamination is always accompanied by the emotion of disgust. However, mental contamination can be identified as an independent construct and may relate to outcomes independent of disgust, as shown in the incremental validity analyses.

As hypothesized, the SMCS was found to be a good indicator for feelings of dirtiness following the imagined scenarios. The SMCS correlated with items with which it was expected to correlate, and predicted other symptoms of mental contamination such as feeling violated, identifying physical body areas as dirty, and having urges to wash/compensate. This finding provides evidence that the SMCS can be used as a measure for state mental contamination and can give researchers a tool for quantifying state mental contamination. The SMCS would serve as a self-report measure with great utility, making state mental contamination easy to study in various settings, such as in online studies or in situations where time is constrained, which is not something existing measures of state mental contamination can offer.

Overall, the effect of state mental contamination should be further researched. With a paradigm that effectively induces high amounts of mental contamination and a reliable measure for the “feeling dirty” aspect of mental contamination, more experiments can be performed to examine how mental contamination influences outcomes in both clinical and non-clinical settings. Furthermore, disgust and mental contamination can be differentiated in areas where only disgust has been previously studied.

CHAPTER FOUR

Mental Contamination and Social Distance

Introduction

The purpose of the current study was to explore the effect of state mental contamination on a disgust-related phenomenon: prejudice. We sought to apply the paradigm in a general population and measure how state mental contamination predicts social distance. Because both experimental scenarios were previously shown to evoke equal amounts of state mental contamination, they were both included in order to see if they would differentially impact social distance. It was hypothesized that scenarios high in disgust-related imagery, both in physical disgust, as well as moral-disgust and betrayal would evoke high levels of disgust and mental contamination compared to the neutral scenario. It was also hypothesized that higher state mental contamination would predict greater social distance toward groups potentially associated with disgust prejudice- individuals who are homeless, have mental illness, are poor and receiving welfare, and those who are very wealthy. It was expected that state mental contamination would be unrelated to social distance toward African Americans, a group not associated with disgust prejudice. Neuroticism, a variable that may be related to prejudice (McFarland, 2010) and to feelings of dirtiness (Elliott & Radomsky, 2013), and social desirability, a variable that may influence self-reports of prejudice (Batson, Naifeh, & Pate, 1978), were controlled.

Method

Participants

Participants were 211 adult MTurk users. Age ranged from 19 to 64 ($M = 32.81$, $SD = 9.98$). Equal numbers of men and women were represented (105 male, 105 females, 1 missing). Seventy-nine percent self-identified as White/Caucasian, 7% as Black/African American, 6% as Asian, 6% as Hispanic/Latino, 1% as Native American, and 2% as “other”. Ninety-nine percent of participants had at least a GED. The sample size was estimated using G*power (Faul et al., 2007), expecting a moderate effect of each scenario on mental contamination and accounting for potential exclusion of cases as outliers or incomplete data ($\beta = .80$).

Measures

Imagined scenarios. Scenarios containing imagery high in the emotion of disgust were used to evoke mental contamination. A scenario with physically disgusting imagery, a scenario with high morally disgusting imagery, and a neutral scenario with no disgusting imagery, were used. Respondents were instructed to relax and fully imagine themselves in the scenario (see Appendix A).

State mental contamination. The State Mental Contamination Scale (SMCS) was previously developed using the VOICI-MC (Radomsky et al., 2014) and was used to measure state mental contamination (see appendix B). Items were rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*), where a higher score indicated more

state mental contamination. The SMCS was found to have good internal consistency ($\alpha = .97$).

State disgust. A single item measure was used to assess state disgust (Elliott & Radomsky, 2009). This item was rated on a scale from 0 to 100 such that a higher score indicated more state disgust.

Neuroticism. The 20-item neuroticism subscale of the International Personality Item Pool (IPIP) version of the NEO Personality Inventory (originally from Costa & McCrae, 1992) was used to measure trait neuroticism. Responses to the self-report items ranged from 1 (*strongly disagree*) to 5 (*strongly agree*) such that higher scores indicated higher neuroticism, or emotionality. The IPIP versions of personality scales have been found to have similar or better reliability and validity as their original forms (Goldberg et al., 2006). The items in the current study were found to have excellent reliability ($\alpha = .95$).

Desirable responding. The Balanced Inventory for Desirable Responding (BIDR; Paulhus, 1984) contains 40 items measuring two facets of desirable responding. The first subscale is a 20-item measure of self-deceptive positivity, which is one's overconfidence in personal thoughts and attributes (e.g. "It would be hard for me to break any of my bad habits" and "I always know why I like things"). The second subscale is a 20-item measure of impression management, which is one's deliberate attempt to create a more positive social image (e.g. "I never swear" and "When I hear people talking privately, I avoid listening."). All items are rated on a scale from 1 (*not true*) to 7 (*very true*), and respondents received 1 point if they responded with a 6 or 7 in the desirable way. All

other responses are given a 0, such that a high score indicated more social desirability. The self-deceptive positivity scale and impression management scale showed good reliability in the current study ($\alpha = .86$ and $.82$, respectively). Both scales are associated with other lie scales and scales of social desirability among forensic and normal populations (Lanyon & Carle, 2007).

Social distance. The social distance items were originally developed by Bogardus (1925), but an adapted version from Norman, Windell, and Manchanda (2010) was used in the current study. This 12-item adapted version was created to measure behavioral intentions to interact with an outgroup member, with items such as “I would take a job where I would be working with that person” and “I would rent a room to the person”. Response options ranged from 1 (*I certainly would*) to 5 (*I certainly would not*), such that a high score indicated more social distance. Each of the five outgroups used the same 12 items, except for the homeless group, where the items “I would go to a party at the person’s house” and “I would move into a home next door” were removed. Cronbach’s alpha ranged from $.92$ to $.96$ for the five outgroup measures.

Procedure

Participants were recruited from MTurk in the same way as in the previous study. Additionally, people who participated in the previous study were not able to participate in the current study. After consenting to participate, subjects were directed to relax in their chairs and vividly imagine one of the three randomly assigned scenarios. After visualizing the scenario, participants took the SMCS, followed by three of the five social distance surveys, which were randomly assigned. Participants then took the BIDR and

measure of neuroticism. Lastly, participants were debriefed about the specific purpose of the study. Upon completion of the study, participants were paid a small amount (\$2.00 USD).

Results

Upon preliminary inspection of the data, less than 1% of data were missing and were found to be missing completely at random ($\chi^2(3548) = 3436.71, p = .908$) and so were imputed using estimation maximization (EM). No outliers were detected, leaving 211 usable cases. The pattern of results was consistent when cases with missing data were excluded listwise.

Mental contamination significantly differed across conditions ($F(2, 208) = 36.83, p < .001$). Variances were unequal ($F(2, 208) = 13.57, p < .001$), so Dunnett's C control for comparisons was used for post hoc tests. The physically disgusting scenario ($M = 37.81, SD = 16.16$) and morally disgusting scenario ($M = 40.34, SD = 17.81$) evoked significantly more mental contamination than the neutral scenario ($M = 20.49, SD = 11.18, p < .001$). Similarly, state disgust differed across conditions ($F(2, 208) = 237.621, p < .001$). Variances were unequal ($F(2, 208) = 11.46, p < .001$), so Dunnett's C control for comparisons was used. The morally disgusting condition ($M = 88.92, SD = 21.23$) evoked significantly more disgust than the physically disgusting scenario ($M = 72.44, SD = 30.15, p = .001$), and both evoked significantly more disgust than the neutral scenario ($M = 8.14, SD = 17.38, p < .001$).

Effects on Social Distance

Mean scores for social distance across groups are shown in Figure 4.1. When controlling for self-deceptive positivity, impression management, and neuroticism, state mental contamination was not a predictor of social distance toward any social group (see Table 4.1). Analyses were performed on the experimental groups only, and because of the theoretical dependence of state mental contamination on disgust, state disgust was not controlled in the analyses. Analyses showed that state disgust was a predictor of social distance toward the homeless and poor groups, but not the mental illness, wealthy, or African American groups (see Table 4.2). It is also important to note that there were no differences in social distance toward African Americans across racial groups, nor was there a difference in social distance toward wealthy individuals across income brackets.

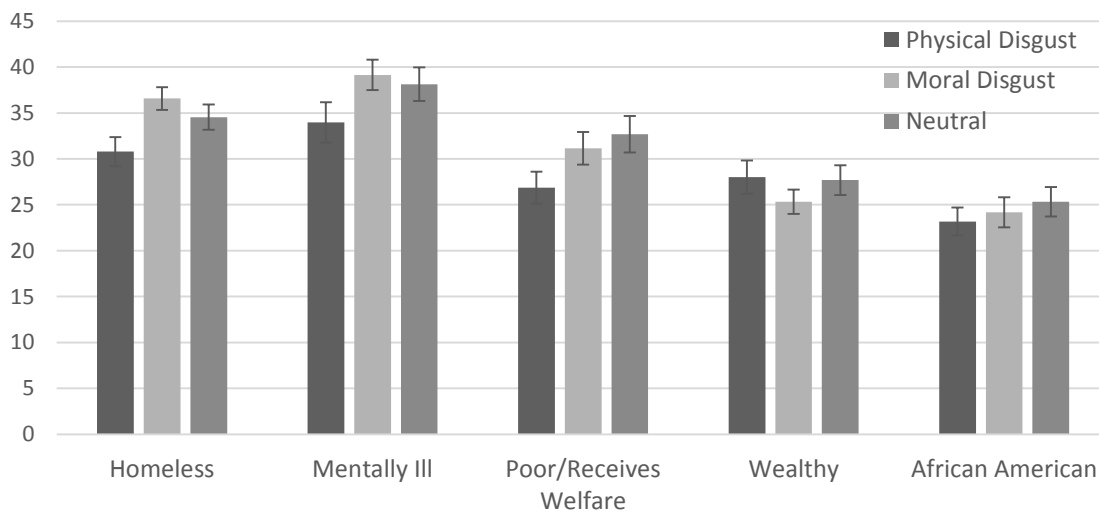


Figure 4.1. Mean of social distance toward groups across conditions. Social distance scores for the homeless group ranged from 10-50 (midpoint = 30), all other groups had a potential range from 12-60 (midpoint = 36). A higher score indicates more social distance. Error bars denote standard errors.

Table 4.1

Standardized Beta Weights Predicting Social Distance, with Covariates

Predictor	Outgroup Member				
	Homeless	Mentally Ill	Poor/Receives Welfare	Wealthy	African American
State Mental Contamination	.13	.04	.20†	-.13	-.06
Impression Management	-.15	-.44***	-.33**	.02	.05
Self-Deceptive Positivity	-.32*	.02	-.10	-.13	-.25†
Neuroticism	-.19	-.25*	.03	.25*	.20

Note. $N = 139$

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$, † $p \leq .10$

Table 4.2

Standardized Beta Weights Predicting Social Distance with Inclusion of State Disgust and Covariates

Predictor	Outgroup Member				
	Homeless	Mentally Ill	Poor/Receives Welfare	Wealthy	African American
State Disgust	.34**	.10	.26*	-.13	.00
State Mental Contamination	.00	.00	.11	-.09	-.06
Impression Management	-.17	-.45***	-.34**	.03	.05
Self-Deceptive Positivity	-.34*	.01	-.12	-.12	-.25†
Neuroticism	-.20	-.25*	.02	.26*	.20

Note. $N = 139$

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$, † $p \leq .10$

To see if state mental contamination differentially predicted social distance between the experimental conditions, regression analyses using one dummy coded variable comparing the experimental scenarios was used, as well as the interaction between scenario and mean centered state mental contamination (Table 4.3) and mean centered state disgust (Table 4.4). There is evidence that the experimental scenarios differentially impacted social distance toward the homeless outgroup, suggesting that

social distance may be greater after experiencing moral disgust than physical disgust; however there is no evidence to suggest that the experimental scenarios or interactions with the experimental scenarios were influential factors in social distance toward other outgroup members.

Table 4.3

Standardized Beta Weights of Mental Contamination Predicting Social Distance Across Moral and Physical Conditions, with Inclusion of Scenario and Covariates

Predictor	Outgroup Member				
	Homeless	Mentally Ill	Poor/Receives Welfare	Wealthy	African American
State Mental Contamination	.03	.01	.00	-.10	-.22
Impression Management	-.11	-.44***	-.33**	.01	.06
Self-Deceptive Positivity	-.25	.08	-.02	-.15	-.23
Neuroticism	-.11	-.21	.06	.22	.22
Scenario	-.26*	-.11	-.16	.17	-.03
Scenario*Mental Contamination	.08	.05	.16	-.04	.17

Note. $N = 139$

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$, † $p \leq .10$

Table 4.4

Standardized Beta Weights of Disgust Predicting Social Distance Across Moral and Physical Conditions, with Inclusion of Scenario and Covariates

Predictor	Outgroup Member				
	Homeless	Mentally Ill	Poor/Receives Welfare	Wealthy	African American
State Disgust	.31	.18	.04†	-.06	-.16
Impression Management	-.13	-.45***	-.37**	.00	.08
Self-Deceptive Positivity	-.30†	.06	-.05	-.18	-.25
Neuroticism	-.13	-.24	.01	.19	.20
Scenario	-.17	-.08	-.10	.14	-.05
Scenario*Disgust	-.05	-.12	.20	-.06	.15

Note. $N = 139$

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$, † $p \leq .10$

Discussion

The hypothesis that mental contamination would predict social distance toward outgroups was not supported. Of the five outgroups explored, mental contamination and disgust had the highest predictive influence on the homeless and very poor outgroups. This pattern could be due to these groups' more direct relationship to disgust prejudice, which is supported in other literature (Fiske et al., 2002). Prejudice toward those who have a mental illness or who are very wealthy may not be as related to disgust, and therefore not related to mental contamination. There may also be confounds in that mental illness and being wealthy are broad categories without a consistent schema in all participants. When a participant imagines someone with mental illness, the person imagined may be very different than the person another subject imagines, and these schemas may be driven by other emotions, such as fear or anger. Likewise, a person who is wealthy may not be assumed to be greedy or selfish unless that information is offered. However, the effects in the African American condition were consistent with what was expected.

Overall, the respondents' levels of social distance appeared to be attributable to social desirability and neuroticism. Specifically, social distance toward those who are homeless and African American was predicted by self-deceptive positivity, meaning that subjects may have an inflated view of the self and believe that they would not act differentially toward these groups; social distance toward those who are poor and who have mental illness was predicted by impression management, meaning that subjects may have been purposefully trying to create a positive social image by being dishonest about their prejudices; and social distance toward those who are wealthy was predicted by

neuroticism, meaning that more emotionally liable people may want more distance from the wealthy. While these effects were not expected, they are interesting, especially because little research has explored the two facets of social distance and neuroticism as they relate to specific types of prejudice. The current findings in social desirability are novel in that social desirability is split into two facets; most previous research has used a single-faceted measure of social desirability, finding small to moderate relationships with prejudice (e.g., Aosved, Long, & Voller, 2009; Batson et al., 1978), so the current study's results could be attributable to measurement specificity. The current study's measurement of various outgroups provide results that could also give insight into why the neuroticism-prejudice relationship varies among studies (Sibley & Duckitt, 2008). These relationships between social desirability, neuroticism, and social distance deserve further exploration before clear conclusions can be made.

CHAPTER FIVE

Conclusion

Overall, the hypothesis that state mental contamination could be manipulated and quantitatively measured was supported, but the hypothesis that mental contamination would predict social distance toward outgroups was not supported. The experimental manipulations showed the ability to evoke high amounts of both state mental contamination and state disgust, although the physical and morally disgusting scenarios did not show consistent differences across both studies. The morally disgusting condition evoked significantly more disgust in the second study, but not significantly more mental contamination in either study. Because it evoked *slightly* more mental contamination and state disgust in both studies, researchers who wish to use only one experimental condition in future research may be best served by the morally disgusting scenario. With these scenarios, it is interesting to note that a visualization of moral disgust can produce high amounts of mental contamination. This finding highlights the indirect contaminant aspect of mental contamination and affirms that mental contamination has moral and emotional elements (Fairbrother & Rachman, 2004). It also emphasizes that mental contamination is not simply the product of a memory of physical contamination.

The state measure developed, the SMCS, displayed adequate reliability and validity as a measure of “feeling dirty.” While this measured aspect of mental contamination does not capture all of the cognitive and emotional aspects of mental contamination, the SMCS did strongly correlate with outcome variables of mental

contamination. Compared to a single item measuring feelings of dirtiness, the SMCS was not necessarily a better predictor of places endorsed as dirty, but it was a better predictor for feelings of violations and urges to compensate. Furthermore, because scores for feelings of dirtiness had predictive qualities for other aspects of mental contamination, it may be useful for future research to use the SMCS as a shorter, quantitative measure of state mental contamination. Because of the merit shown for the SMCS, researchers who are interested in any outcome of state mental contamination may find the developed manipulation and measurement useful. In the future, the SMCS by itself could also be used in order to look at other causes and precursors to state mental contamination. The information gained through these types of studies would be useful to clinicians to understand patients' experiences with mental contamination, and could also shape research relating to contamination fears, avoidance, and disgust-related phenomena.

The application of state mental contamination did not predict social distance as expected; however, the second study did show promise for the study of mental contamination in relationship to prejudice toward certain social groups, such as those who are homeless and those who are very poor. These groups have been previously associated with prejudice in forms of disgust and contempt (Fiske et al., 2002), and mental contamination may be more relevant in evaluations of these groups. As the first application of state mental contamination to prejudice, the current study offers some insight into how mental contamination can be studied in the future and what adjustments may be needed.

Limitations and Directions for Future Research

The current studies had multiple limitations to consider. One limitation is the dependence of mental contamination on disgust. Although the dependence was expected based on theory (Fairbrother & Rachman, 2004), it makes disentangling the two constructs difficult. Because the scenarios used in these studies were based on disgust, it must be assumed that mental contamination has a meaningful distinction in disgust outcomes. However, measuring both disgust and mental contamination does allow for some comparison between these two constructs and should always be done in future studies involving mental contamination.

Another limitation is possible redundancy in the SMCS. The exceptionally high reliability could be due to repetition in the items. Inter-item correlations ranged from .51 to .86 in the first study and .52 to .84 in the second study. Future research should examine the items and potentially create a shorter version for increased efficiency and ease of use. Also, it is a limitation that the SMCS does not assess multiple aspects of mental contamination, such as feelings of violation, state emotions related to mental contamination, and current urges to compensate. Researchers or clinicians who are interested in these specific facets of mental contamination in order to diagnose or develop treatment plans for those affected by mental contamination may find other measurements of mental contamination more useful. While the specific facets of mental contamination are important, measuring the intensity of feelings of dirtiness showed it may be enough to be an adequate instrument for researchers needing a self-report measure in experimental research.

Using social distance as an indicator of prejudice is also a limitation due to the influence of social desirability. Participants may not have realistic expectations for their behavioral intentions, and so social distance may have been too explicit of a concept to use. Future research should explore mental contamination in other types of prejudice, especially implicit prejudice, which targets more covert prejudices and associations. Implicit prejudice may be less influenced by social desirability, and so may be influenced more by mental contamination in an experimental setting.

Overall, mental contamination deserves further study within prejudice and may also have relevance to other disgust-related concepts. Studying mental contamination offers some specificity to the study of disgust in social psychology, but also offers a unique way to examine how individuals' internal thoughts and feelings can influence attitudes and behavior. With an effective paradigm and measurement, research in this area can be more standardized and applied to various contexts.

APPENDICES

APPENDIX A

Experimental Materials

Instructions: Please take a moment to make yourself comfortable in your seat. Close your eyes, relax, and take a few slow deep breaths. Slowly breathe in and out. As you exhale, allow yourself to become more and more relaxed. On the following page, you will read a story. As you read it, try to imagine it as clearly and in as much detail as you are able to. Fully picture it in your mind. Try to imagine that you are the person in the scenario and that the events that are being described are happening right now. Try not to picture yourself in the scene. Instead, try to imagine you are seeing it through your own eyes.

Physical Disgust Scenario (Van Overveld et al., 2009)

You work as an assistant in home care. You enter the home of an old man. You hear from the sounds coming from the chamber that something is wrong. Concentrate yourself on what you hear. You open the door. The man appears sick and has vomited. Apparently he was not able to reach the bathroom in time. Concentrate yourself on what you smell. Which fragrances can you distinguish? Concentrate yourself on what you see. What does the man look like? How does he sit? You walk up to the man. Concentrate yourself on the fragrance. Pay attention to the details which you see now. What does his shirt look like? See how fresh vomit mixes with the dried-up remains of vomit from an hour ago. Concentrate on the face of the man, what does this look like? Observe the lumps of vomit that drip down along his chin. The man vomits again. Concentrate yourself on his body. What do you see happening? Concentrate yourself on his face. Concentrate on the sounds of vomiting. Take in the sourish fragrance. What does the goo look like that the man spits out? You are gagging. Concentrate yourself on what you feel happening in your stomach, throat and mouth. Incorporate the sourish taste in your mouth. Some splashes of vomit spatter on your hands and your face. How do you feel? While you help the man out of his clothing, you notice that he is defecating himself. Concentrate yourself on what you see, what you smell and what you hear. You are helping the man. Concentrate on your physical feelings. You are washing the man. What does this look like? Which operations do you have to perform? What does this do to you?

Moral Disgust Scenario (modeled after Haidt et al., 1993 to match formatting of other scenarios)

You go to your parents' house one day to find them eating dinner. You ask what they are eating and they inform you that it was the family dog, which had been hit by a car that morning. The dog was cleaned, cooked, and served whole. Concentrate on how the dog

looks on the plate. How do you feel, seeing your parents eating your dog? Concentrate on the way your parents are eating the dog and the expressions of satisfaction on their faces. Your parents admit that the meat tastes very good and that they have been looking forward to this meal because the meat smelled so good while it was cooking in the oven. You can still sense the smell coming from the kitchen. You look in the kitchen and notice a clump of dog hair on the floor. Concentrate on the hair and how you used to love to pet your dog's fur. Your parents invite you to come to the table, so you sit down next to them. You look at the dishes on the table and at the face of your dog. What do you see? What does this do to you? Concentrate on how your dog looks now and how pieces of your dog are on your parent's plates and forks. You choose not to eat any part of dog, but sit with your parents during the meal. Previously, you had told your parents that if the dog ever died, you would want to bury the dog in the yard, since you loved it so much. Concentrate on the feelings you have, knowing that you can no longer give your dog a proper burial. How do you feel since your parents decided to eat the dog, even though they knew you wanted to bury it?

Neutral Scenario (Van Overveld et al., 2009)

You are about to look up a friend who has moved to another city. You are standing at the platform of the station, waiting for the right train. Concentrate on what you see on the station. Pay attention to all the sounds which you hear. A man comes by with strong aftershave. Concentrate yourself on the fragrance. Gradually it becomes busier at the platform. Concentrate yourself on what you observe when the train approaches the platform. You are standing at the door with two other people. You get in the train. You are searching for a seat. Pay attention to what you see. You have found a seat. You lay down your stuff and will sit down. Concentrate yourself on your surroundings. Look around the train car to see what kind of people sit there. How do they look? What are they doing? Concentrate on what you hear. You look outside. What do you see if you look outside? The conductor comes in and asks for the tickets. What does he look like? What happens when he enters the train car? You look in your pockets to grab your ticket. You show your ticket to the conductor. On your watch you notice that in some minutes, you will arrive at the station of your destination. The train decreases in speed. Concentrate yourself on what you feel in your body when the train slows down. You have arrived at your end destination. Consider what it looks like when the train drives in the station. Concentrate on what you hear. Concentrate yourself on what happens in the train car. You take your case and get up. You are walking through the station in search of the exit. What does the station look like? Concentrate yourself on what you hear. You follow the stream of people towards the exit. Concentrate yourself on how you feel. From your friend you obtained a route description. Following the route description, you walk through the streets of the city. What do you see around you? Which people are walking there? Concentrate on the sounds of the city. You reach the street where you must be. Halfway down the street you discover the house number where you must be. You ring and your friend opens the door.

APPENDIX B

The State Mental Contamination Scale

Instructions: Please rate the extent to which you agree with the following statements:

Scale: 1 (*strongly disagree*) to 5 (*strongly agree*)

1. I look clean but feel dirty.
2. I have an unpleasant image or memory that makes me feel dirty inside.
3. I probably will not get clean no matter how thoroughly I wash myself.
4. I feel dirty under my skin.
5. I feel dirty or contaminated even though I haven't touched anything dirty.
6. Because of my feelings of dirtiness, I feel guilty or ashamed.
7. I am experiencing unwanted and upsetting thoughts about dirtiness.
8. I feel dirty or contaminated without knowing why.
9. Because of my feelings of dirtiness, I feel angry.
10. My unwanted and repugnant thoughts make me feel contaminated or dirty.
11. I feel dirty inside my body.
12. My thoughts make me feel like I need to wash myself.
13. I feel dirty or contaminated, but anyone else would be completely unaffected.
14. My worries about contamination make me very anxious.
15. I feel the need to cleanse my mind.

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