Published in final edited form as:

J Anxiety Disord. 2013 January ; 27(1): 155–162. doi:10.1016/j.janxdis.2012.11.002.

Disgust, Mental Contamination, and Posttraumatic Stress: Unique Relations following Sexual versus Non-Sexual Assault

Christal L. Badour^a, Matthew T. Feldner^{a,b}, Kimberly A. Babson^{c,d}, Heidemarie Blumenthal^a, and Courtney E. Dutton^a

^aUniversity of Arkansas, 216 Memorial Hall, Department of Psychology, Fayetteville, AR 72701, USA

^bLaureate Institute for Brain Research, 6655 S Yale Ave Tulsa, OK 74136; USA

^cCenter for Health Care Evaluation/VA Palo Alto Health Care System, 795 Willow Road (152-MPD), Menlo Park, CA 94025, USA

^dDepartment of Psychiatry and Behavioral Sciences, Stanford School of Medicine, 795 Willow Road (152-MPD), Menlo Park, CA 94025, USA

Abstract

Disgust and mental contamination (or feelings of dirtiness and urges to wash in the absence of a physical contaminant) are increasingly being linked to traumatic event exposure and posttraumatic stress (PTS) symptomatology. Evidence suggests disgust and mental contamination are particularly relevant to sexual assault experiences; however, there has been relatively little direct examination of these relations. The primary aim of the current study was to assess disgust and mental contamination-based reactivity to an individualized interpersonal assault-related script-driven imagery procedure. Participants included 22 women with a history of traumatic sexual assault and 19 women with a history of traumatic non-sexual assault. Sexual assault and PTS symptom severity predicted greater increases in disgust, feelings of dirtiness, and urges to wash in response to the traumatic event script. Finally, assault type affected the association between PTS symptom severity and increases in feelings of dirtiness and urges to wash in response to the traumatic event script such that these associations were only significant among sexually assaulted individuals. These findings highlight the need for future research focused on elucidating the nature of the relation between disgust and mental contamination and PTS reactions following various traumatic events.

Keywords

PTSD; Posttraumatic Stress; Sexual Assault; Disgust; Mental Contamination

---

© 2012 Elsevier Ltd. All rights reserved.

Corresponding Author: All correspondence should be directed to Christal L. Badour, M.A., cbadour@uark.edu; Phone: (479) 575-5811; Fax: (479) 575-3219 or Matthew T. Feldner, Ph.D., mfeldne@uark.edu; Phone: (479) 575-5817; Fax: (479) 575-3219.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1. Introduction

Emerging research supports a role for disgust, defined as a rejection or revulsion response aimed at removing oneself from the presence of a potential contaminant (Davey, 1994), in posttraumatic stress (PTS) symptomatology that may be unique from other affective experiences. For example, persistent feelings of disgust differentiate individuals with posttraumatic stress disorder (PTSD) from those with depression, chronic pain, or non-disordered individuals as well as, or better than, other affective reactions such as fear, anxiety, anger, or sadness (Finucane, Dima, Ferreira, & Halvorsen, 2012; Foy, Sippelle, Rueger, & Carroll, 1984). In addition, intensity of disgust experienced during a traumatic event (i.e., peritraumatically) predicts PTS symptom severity after accounting for the effect of peritraumatic fear responses (Engelhard, Olatunji, & de Jong, 2010) and other types of psychopathology (e.g., obsessive-compulsive [OC] symptoms; Badour, Bown, Adams, Bunaciu, & Feldner, 2012). However, little empirical investigation has focused on advancing our limited understanding of this relation.

Traumatic events involving sexual victimization may be particularly likely to elicit disgust responses. For example, sexual assault victims frequently report ongoing distress related to feelings of self-focused disgust (Petrak, Doyle, Williams, Buchan, & Forster, 1997), and one study found that sexually assaulted adolescents were six times more likely to retrospectively endorse the presence of peritraumatic disgust as well as report significantly greater intensity of peritraumatic disgust compared to non-sexually (physically) assaulted adolescents (Feldner et al., 2010). Furthermore, those with histories of both assault types rated the sexual assaults as significantly more disgusting than the physical assaults. Conversely, no differences emerged in terms of presence or intensity of peritraumatic fear or helplessness.

Sexual assault also may be particularly likely to lead to the belief that one has been contaminated by the experience. Feelings of disgust, contact with bodily products (e.g., saliva, semen, blood) and perceptions of violation, debasement, immorality, or impurity during a sexual assault may result in perceived contamination (Rachman, 2004, 2006). For example, Fairbrother and Rachman (2004) demonstrated that 70% of women reported having an urge to wash following a sexual assault, with more than one quarter of these individuals continuing to experience such urges for up to a year post-assault. Contamination concerns in the context of sexual victimization may center around persistent perceptions of internal dirtiness and an inability to remove the source of pollution even when one is no longer in contact with the perpetrator (Fairbrother & Rachman, 2004; Rachman, 2004, 2006). These characteristic internal feelings of dirtiness may result, at least in part, from an internalization of feelings of disgust experienced in relation to the sexual assault experience (Olatunji, Elwood, Williams, & Lohr, 2008). Further, it has been postulated that this phenomenon, termed mental contamination (or mental pollution; Rachman, 2006), can be elicited by internal experiences such as thoughts, images, or memories in the absence of a physical contaminant (Fairbrother & Rachman, 2004; Herba & Rachman, 2007). Consistent with this idea, Fairbrother and Rachman (2004) documented greater feelings of dirtiness, urges to wash, anxiety, and distress in response to an idiographic assault script as compared to a pleasant script among sexual assault victims.

Despite growing recognition that experiences of sexual assault may lead to both feelings of disgust and mental contamination, there has been a relative dearth of empirical research examining associations between these two factors and how they may relate to PTS symptomatology. Preliminary work suggests women with PTSD report elevated disgust and guilt (but not fear) in response to idiographic reminders of childhood sexual abuse as compared to those without PTSD (Shin et al., 1999). Moreover, positive correlations have been observed between sexual assault-related feelings of mental contamination and PTS

symptom severity among sexually assaulted women (Fairbrother & Rachman, 2004) even after accounting for symptoms of depression and general elevations in anxiety (Olatunji et al., 2008). Theory suggests feelings of mental contamination should involve disgust as well as other emotions such as shame, humiliation, contempt, and anxiety (Herba & Rachman, 2007; Rachman, 2004, 2006). However, extant research has been limited by examining these constructs separately.

In addition to simultaneously examining disgust, mental contamination, and PTS symptomatology, two additional gaps in this literature further constrain our understanding of this area. First, although disgust and mental contamination may relate to PTS symptoms following sexual assault, it is important to examine whether these phenomena are relatively unique to traumatic experiences that are sexual in nature or if they play an important role following other traumatic events (similar to anxiety and fear). Non-sexual assaults may be ideal comparisons given that both sexual and non-sexual assaults involve aspects of interpersonal violation. While research on mental contamination in particular has been limited to considering situations involving sexual violation, Rachman (2004, 2006) suggests mental contamination may also emerge following other types of experiences involving violations of morality, betrayal and contact with individuals perceived to be impure or morally “untouchable.” Empirical evidence also suggests reminders of interpersonal assault (collapsed across sexual and non-sexual) result in greater elicitation of disgust as compared to reminders of non-interpersonal traumatic events (e.g., accidents, natural disasters; Badour et al., 2011). Therefore a timely, significant, and unique extension to this research is to compare linkages among disgust, mental contamination, and PTS symptoms among sexual versus physical assault survivors.

Second, given disgust and mental contamination have been most extensively researched within the context of obsessive-compulsive disorder (OCD; Cogle, Lee, Horowitz, Wolitzky-Taylor, & Telch, 2008; Elliott & Radomsky, 2009; McKay, 2006; Radomsky & Elliott, 2009; Stein, Liu, Shapira, & Goodman, 2001) it is important to examine if disgust, mental contamination, and PTS symptomatology are uniquely related above and beyond the presence of OC symptoms. This is a particularly important specificity test in light of a growing literature documenting the co-occurrence of PTS and OC symptoms among traumatic event-exposed individuals (Boudreaux, Kilpatrick, Resnick, Best, & Saunders, 1998; Brown, Campbell, Lehman, Grisham, & Mancill, 2001; Huppert et al., 2005; Solomon et al., 1991).

With this background, the current study sought to begin addressing several gaps in this literature. First, this study utilized the well-established script-driven imagery paradigm to examine how PTS symptom severity relates to a range of affective reactions including feelings of mental contamination, disgust, and anxiety in response to cues of traumatic sexual or non-sexual assault. This approach is a significant strength over questionnaire-based measures in that it allows for an examination of real-time affective reactivity to traumatic event cues that is characteristic of the hallmark PTS symptomatology (Hopper, Frewen, Sack, Lanius, & van der Kolk, 2007; Orr & Roth, 2000). It was hypothesized that PTS symptom severity would relate to greater increases in 1) mental contamination (i.e., feelings of dirtiness, urges to wash), 2) disgust, and 3) anxiety in response to an individualized traumatic event script. It was further hypothesized that individualized sexual assault cues, compared to non-sexual assault cues would elicit greater increases in 1) mental contamination and 2) disgust. Similar increases in anxiety were expected across groups. Next, as feelings of disgust and mental contamination are theorized to be relatively unique correlates of sexual assault and related PTS reactions, it was hypothesized that the associations between PTS symptom severity and increases in 1) mental contamination and 2) disgust elicited by the traumatic event script would be greater among individuals with a

history of sexual assault than those with a history of non-sexual assault. It was anticipated that the association between PTS symptom severity and increases in anxiety would be elevated among individuals with both traumatic event types. Finally, it was hypothesized that these relations with PTS symptoms would remain significant even after accounting for severity of OC symptomatology, suggesting unique associations with PTS symptomatology.

2. Method

2.1. Participants

The sample consisted of 40 female adults ($M_{\text{age}} = 28.18$, $SD = 13.93$) with a positive history of traumatic event exposure as defined by meeting criterion A of the *Diagnostic and Statistical Manual Fourth Edition* (DSM-IV) diagnosis for PTSD (i.e., exposure to an event characterized by perceived threat of death or serious injury that is accompanied by a response of extreme fear, helplessness, or horror; American Psychiatric Association [APA], 1994). Participants were divided into two non-overlapping groups based on self-reported history of traumatic sexual or non-sexual assault (i.e., physical assault). Participants in the sexual assault group denied any history of physical assault and participants in the non-sexual assault group denied any history of sexual assault.

The sexual assault group ($n = 22$) included persons who endorsed an index traumatic sexual assault (and denied a history of non-sexual assault). The non-sexual assault group ($n = 18$) included persons who endorsed an index traumatic assault that was physical in nature (and denied a history of sexual assault). Participants in the sexual assault group endorsed the following range of non-exclusive acts: attempted sexual assault ($n = 1$), vaginal intercourse ($n = 15$), oral intercourse ($n = 4$), anal intercourse ($n = 2$), and other sexual act ($n = 3$). In the sexual assault group, participants' relationship to the assailant included relative ($n = 4$), intimate partner/spouse ($n = 2$), acquaintance ($n = 9$), friend ($n = 4$), coworker ($n = 1$), and stranger ($n = 2$). Participants in the non-sexual assault group endorsed the following: attempted physical assault ($n = 2$), punched, hit, kicked, or choked ($n = 13$), and threatened at gun or knife point ($n = 2$). In the non-sexual assault group, participants' relationship to the assailant included relative ($n = 7$), intimate partner/spouse ($n = 8$), coworker ($n = 1$), other known person ($n = 1$), and stranger ($n = 1$). The ethnic and racial composition of the sample was reflective of the local area. Specifically, 10.0% of participants identified as ethnically Hispanic. Racial composition included 80.0% of individuals identifying as Caucasian, 7.5% as African American, 2.5% as American Indian/Alaska Native, 7.5% as multi-racial, and 2.5% as other. Participants were excluded from the study based on the following criteria: inability to provide written-informed consent, self-reported history of separate instances of both traumatic sexual and non-sexual assault experiences, indication that a non-assault-related traumatic experience was the most upsetting traumatic event, or experience of any traumatic event within one month prior to the study.

2.2. Measures

2.2.1. Assault characteristics—A modified version of the Assault Information and History Interview (AIHI; Foa & Rothbaum, 2001) was administered in questionnaire format to assess the nature of the respondent's relationship to her assailant, and the sexual or non-sexual acts that occurred during the assault.

2.2.2. Posttraumatic stress symptoms—The Clinician-Administered PTSD Scale for DSM-IV (CAPS; Blake et al., 1995) is a well-established semi-structured interview that provides an index of DSM-IV (APA, 1994)-defined traumatic event exposure. The CAPS also provides a measure of frequency and intensity of 17 PTS symptoms, as well as a dichotomous index of PTSD diagnosis. The CAPS has excellent psychometric properties

including both convergent and discriminant validity, adequate test-retest and interrater reliability, and internal consistency (Weathers, Keane, & Davidson, 2001) and is considered a gold standard of PTSD assessment. A trained graduate-level researcher administered all interviews. A second graduate-level researcher trained in administration and scoring of the CAPS who was not involved in this project conducted reliability checks of 20% of the interviews, yielding 100% diagnostic agreement. For the purposes of the current study, PTS symptom severity was measured continuously due to research suggesting a dimensional (as opposed to taxonic) symptom structure, with PTSD at the upper end of the symptom continuum (Ruscio, Ruscio, & Keane, 2002). Accordingly, a PTS symptom severity score was computed by summing the frequency and intensity scores obtained for the 17 symptoms on the CAPS. Additionally, diagnostic status was obtained for descriptive purposes using the 1, 2 scoring rules recommended by Weathers, Ruscio, and Keane (1999).

2.2.3. Obsessive-compulsive symptoms—Severity of OC symptoms was assessed using the well-established Obsessive-Compulsive Inventory-Revised (OCI-R; Foa et al., 2002), which is an 18-item self-report measure that provides an index of the severity of 6 domains of OC symptoms, including washing (i.e., contamination concerns), checking/doubting, obsessing, neutralizing, ordering, and hoarding. Summing each of the subscale scores can also generate a total symptom score. Items are rated on a 5-point Likert-type scale ranging from 0 (*not at all*) to 4 (*extremely*). This measure has evidenced strong psychometric properties (Foa et al., 2002) including good internal consistency (alphas = .81 to .93 across samples) and adequate test-retest reliability (.57 to .91 across samples). The total OCI-R score was included as a covariate in primary analyses due to established relations between OC symptoms and mental contamination (Cougle et al., 2008; Elliott & Radomsky, 2009; Radomsky & Elliott, 2009), disgust (for reviews see Cisler, Olatunji, & Lohr, 2008; Olatunji, Cisler, McKay, & Phillips, 2010), and PTS symptoms (Boudreaux et al., 1998; Brown et al., 2001; Huppert et al., 2005; Solomon et al., 1991).

2.2.4. Script reactivity—An assessment strategy was employed to measure participants' reactions to the script-driven imagery task in terms of change in two primary aspects of mental contamination (i.e., feelings of dirtiness and urges to wash) as well as disgust and anxiety.

2.2.4.1. Mental contamination: Ratings of changes in perceived dirtiness and urges to wash in response to the script-driven imagery procedure were measured using the Mental Contamination Report (MCR; Herba & Rachman, 2007). This measure asks respondents to rate the degree to which they currently feel dirty and have urges to participate in each of five washing behaviors. Perceived dirtiness was measured via a Likert-type scale indicating the degree to which an individual feels dirty or unclean (*not at all* to *very much*). Using the same scale, participants rated the degree to which they experienced an urge to engage in five washing behaviors including 1) *rinse mouth/spit/drink something*, 2) *brush teeth/use mouthwash*, 3) *wash my face*, 4) *wash my hands*, and 5) *take a shower*. An average of ratings on these five items yielded an index of urges to wash. Good internal consistency has been established among the five washing behavior items ($\alpha = .86 - .88$ in the current study). The MCR was administered prior to and following each script, and change scores for feelings of dirtiness and urges to wash in response to each script were calculated by subtracting pre-script ratings from post-script ratings.

2.2.4.2. Disgust and anxiety: Change in ratings of self-reported disgust and anxiety elicited by the script-driven imagery procedure was assessed using ratings on a series of visual analog scales (VAS; Freyd, 1923). The scales consisted of 100 mm lines anchored at either end by *no anxiety/no disgust* and *extreme anxiety/extreme disgust*. Respondents provided

ratings by drawing a single vertical mark on each 100 mm line. The distance between the no anxiety/disgust anchor and the mark generated by the participant was measured to create ratings between 0 and 100 for each emotion. The use of VAS ratings to index emotional responding has been successfully employed in research using script-driven imagery procedures (e.g., Badour et al., 2011; Olatunji et al., 2009). In the current study, participants were asked to report current levels of disgust and anxiety prior to and following the presentation of each of the scripts. Self-reported vividness of each script was also obtained using this method following script presentation (*not at all vivid to extremely vivid*). Change scores for disgust and anxiety in response to each script were created to account for baseline elevations in disgust and anxiety. Change scores were calculated by subtracting pre-script ratings from post-script ratings for each script.

2.3. Procedure

All procedures were approved by the local Institutional Review Board. Participants were recruited via announcements and postings placed throughout a mid-sized community in the south-central United States. Interested individuals were given instructions to contact the laboratory and a preliminary screening for eligibility was conducted over the telephone. Women deemed potentially eligible upon the initial phone screening were invited to attend a laboratory session.

All laboratory procedures were conducted in a 12' × 14' experimental room containing a chair, desk, computer, and audio recorder. The experimenter was located in an adjacent room. An intercom system and closed-circuit surveillance system were in place to allow for monitoring and communication between the experimenter and participant. During the laboratory session, participants were informed of any potential risks associated with the study (e.g., temporary psychological distress associated with the script-driven imagery procedure) and written informed consent was provided. The CAPS was then administered. Individuals identified as ineligible at this time were thanked, debriefed, and compensated \$10 for completing the initial portion of the study.

2.3.1. Script development—Eligible participants were then seated in a quiet room where they were asked to generate two written scripts based on autobiographical experiences. Script content included an individualized description of one emotionally neutral experience (e.g., a trip to the grocery store) as well as the index traumatic experience identified during the CAPS. Specific procedures for script development followed those described in previous work (e.g., Lang, Levin, Miller, & Kozak, 1983; Pitman et al., 1987). Per published procedures (e.g., Pitman et al., 1987), a checklist of specific bodily sensations (e.g., racing heart) was administered to participants during the script generation period to assist in identifying sensations present during the event and incorporating them into the scripts. Upon finishing the written scripts, participants were asked to complete questionnaires that included demographic information, the OCI-R, and other measures not relevant to the current project. During this time, the experimenter left the room to create an audio recording of the scripts to be used during the script-driven imagery procedure.

2.3.2. Script-driven imagery procedure—All participants were presented first with their individualized neutral script, followed by the traumatic event script. Each script presentation included the following: 1) a 2-min pre-script baseline assessment period, which included VAS ratings for anxiety and disgust as well as the MCR, 2) a 30-sec quiet baseline period in which participants were asked to close their eyes and prepare for the script presentation, 3) a 30-sec script presentation, 4) a 30-sec imaginal rehearsal period in which participants were instructed to continue imagining the scene as vividly as possible, 5) a 30-

sec recovery period, and 6) a 2-min post-script assessment period that included anxiety, disgust, and script vividness VAS ratings, and the MCR.

2.3.3. Debriefing and compensation—Participants were then debriefed regarding all study procedures and thanked for their time. Referral information was provided to all participants for local women's shelters, rape crisis centers, and general mental health services. Participants were compensated \$30.

3. Results

3.1. Descriptive Statistics

Thirty-three percent of the total sample met diagnostic criteria for PTSD ($n = 13$), which was slightly higher than rates observed in previous community samples of assaulted women (Kilpatrick & Acierno, 2003). Twenty-five percent of participants ($n = 10$) endorsed a level of OC symptoms above the cutoff recommended by Foa and colleagues (2002) for distinguishing between individuals with OCD and those with either PTSD or generalized social phobia (i.e., anxious controls). Of the total sample, 12.5% ($n = 5$) satisfied diagnostic criteria for PTSD while concurrently meeting the cutoff for a probable diagnosis of OCD, further supporting the importance of the proposed specificity test.

Table 1 lists assault type group comparisons across relevant variables. The sexual assault group demonstrated greater decreases in feelings of dirtiness in response to the neutral script and greater increases in feelings of dirtiness and urges to wash in response to the traumatic event script. Chi-square analyses were used to examine differences between the two assault groups in relation to dichotomous variables. Specifically, groups did not differ in terms of percentage of individuals meeting criteria for a current diagnosis of PTSD (27.2% among sexual assault victims versus 38.9% of physical assault victims; $\chi^2 [1, N = 40] = .61, p = .44$) or probable diagnosis of OCD (22.7% among sexual assault victims versus 27.8% among physical assault victims; $\chi^2 [1, N = 40] = .14, p = .73$).

Table 2 includes zero-order correlations among all variables. Of note, PTS symptom severity was significantly positively correlated with change in feelings of dirtiness, urges to wash, disgust, and anxiety in response to the assault script. Significant negative correlations emerged with change in disgust and anxiety in response to the neutral script, suggesting the possibility of baseline elevations in pre-script ratings of these emotions among individuals higher in PTS symptoms. Correlations between OC symptoms and measures of change in feelings of dirtiness, urges to wash, disgust, and anxiety were not statistically significant. However, examination of the raw responses (cf., change scores) revealed significant positive correlations between OC symptoms and feelings of dirtiness ($r = .33$), urges to wash ($r = .43$), and anxiety ($r = .35$) following the assault script, while the correlation with disgust following the assault script was nonsignificant ($r = .04$).

3.2. Primary Hypothesis Tests

Data were submitted to four separate hierarchical linear regression models to examine predictors of change in 1) feelings of dirtiness, 2) urges to wash, 3) disgust ratings, and 4) anxiety ratings in response to the traumatic event script. Obsessive-compulsive symptoms and change in 1) feelings of dirtiness, 2) urges to wash, 3) disgust ratings, or 4) anxiety ratings in response to the neutral script were entered as covariates in step 1 of each respective model to establish that the pattern of results could not be accounted for by OC symptoms (Badour et al., 2012) or general affective reactivity (Olatunji et al., 2009). Main effects of assault type (sexual, physical) and PTS symptom severity were entered into step 2. Finally, the interaction between assault type and PTS symptom severity was entered into

step 3 of each model. All continuous variables were mean-centered prior to entry into the regression models and post-hoc probing of significant interactions was conducted in accordance with recommendations (Holmbeck, 2002). Table 3 includes an overview of analyses.

3.2.1. Feelings of dirtiness—A significant omnibus regression model emerged in predicting change in feelings of dirtiness in response to the traumatic event script [$F(5,34) = 5.89, p = .001$], accounting for 46.4% of the total variance. Covariates entered into step 1 of the model accounted for 14.9% of the total model variance ($p = .05$). Significant main effects of assault type and PTS symptom severity entered at step 2 accounted for an additional 22.5% of variance ($p = .005$). Finally, the significant interaction between assault type and PTS symptoms accounted for an additional 9.0% of variance in the model ($p = .02$). Post-hoc probing of the interaction revealed that PTS symptoms significantly predicted increases in feelings of dirtiness in response to the traumatic event script among individuals with a history of sexual assault ($\beta = .82, p < .001, sr^2 = .32$), but not among those with a history of non-sexual assault ($\beta = .13, p = .48, sr^2 = .01$).

3.2.2. Urges to wash—A significant omnibus regression model emerged in predicting change in urges to wash in response to the traumatic event script [$F(5,34) = 6.90, p < .001$] with the overall model accounting for 50.4% of the total variance. Covariates entered into step 1 of the model accounted for 19.7% of the total model variance ($p = .02$). Significant main effects of assault type and PTS symptom severity entered at step 2 accounted for an additional 19.7% of variance ($p = .007$). Finally, the significant interaction between assault type and PTS symptom severity accounted for an additional 10.9% of variance in the model ($p = .01$). Post-hoc probing of the interaction revealed that PTS symptom severity significantly predicted increases in urges to wash in response to the traumatic event script among individuals with a history of sexual assault ($\beta = .85, p < .001, sr^2 = .26$), but not among those with a history of non-sexual assault ($\beta = -.02, p = .92, sr^2 = .00$).

3.2.3. Disgust—A significant omnibus regression model emerged in predicting change in disgust in response to the traumatic event script [$F(5,34) = 5.57, p = .001$] with the overall model accounting for 45.0% of the total variance. Covariates entered into step 1 of the model accounted for 15.5% of the total model variance ($p = .04$). Significant main effects of assault type and PTS symptom severity entered at step 2 accounted for an additional 29.3% of variance ($p = .001$). Finally, the interaction between assault type and PTS symptom severity was not significant, accounting for an additional 0.2% of variance in the model ($p = .73$).

3.2.4. Anxiety—The overall model predicting change in feelings of anxiety in response to the traumatic event script accounted for 17.8% of total variance and did not reach significance [$F(5,34) = 1.47, p = .23$]. No individual predictors emerged as statistically significant in this model.¹

4. Discussion

The current study was designed to uniquely expand upon a burgeoning literature linking disgust and related phenomena to the sequelae of sexual assault by examining whether PTS symptom severity predicted real-time elicitation of mental contamination (i.e., feelings of dirtiness, urges to wash) disgust, and anxiety, and whether these associations were affected

¹Consistent with previous research using the script-driven imagery procedure (Pitman et al., 1990; Shin et al., 2004), individuals with PTSD evidenced significantly greater anxious reactivity to the traumatic event script compared to individuals without a diagnosis of PTSD ($\beta = .40, p = .01, sr^2 = .15$).

by the presence of sexual as compared to non-sexual victimization. Results of the study were generally consistent with hypotheses.

First, as expected, both PTS symptom severity and assault type were associated with increased feelings of dirtiness and urges to wash in response to the traumatic event script. These patterns were qualified by significant interactions such that severity of PTS symptoms predicted increases in feelings of dirtiness and urges to wash among sexually assaulted individuals, but no such relation emerged for those in the non-sexual assault group. These findings suggest PTS symptom severity is likely related to mental contamination, but that this relation may be relatively specific to sexual assault. Epidemiological research suggests that victims of sexual assault are more likely to develop PTSD than those exposed to any other traumatic event type, including non-sexual assault (Breslau et al., 1991; Norris et al., 1992). Research is now needed that examines mental contamination as a factor that may account for the particularly toxic effects of sexual assault.

While PTS symptom severity was positively associated with increased disgust in response to the traumatic event script when collapsed across assault type (even after controlling for OC symptoms and general emotional reactivity), the interaction between assault type and PTS symptom severity was not significant. This suggests that although individuals are likely to respond to reminders of sexual assault with greater increases in disgust overall, elevated PTS symptoms predict greater traumatic event-related disgust reactivity following both types of assault experiences. This is consistent with previous findings documenting increased traumatic event-related disgust reactivity among women with PTSD following a variety of traumatic events (Olatunji et al., 2009). Although it has been proposed that mental contamination may emerge following sexual assault as a result of an internalization of feelings of disgust associated with the event (Olatunji et al., 2008), the combination of weak correlations between disgust and urges to wash and the unique pattern of associations with PTS symptom severity highlight that while related, these unique constructs warrant individual attention.

As expected, PTS symptom severity was significantly positively correlated with change in anxiety in response to the assault script (see Table 2). However, associations with PTS symptom severity became non-significant after controlling for covariates. It is possible that the significant relation between PTS symptom severity and change in anxiety in response to the assault script may have largely been driven by general elevations in anxiety reactivity (i.e., change in anxiety to the neutral script) as opposed to traumatic event-specific reactivity. However, examination of the effect size for PTS symptom severity ($sr^2 = .08$) suggests that the current sample was likely underpowered to detect this significant main effect after the inclusion of covariates. In contrast, the nonsignificance and near-zero effect sizes for the assault type by PTS symptom severity interaction and main effect of assault type are not surprising as similar levels of traumatic event-related anxious reactivity have been documented following a range of traumatic experiences (Badour et al., 2011).

A number of limitations to the current study need to be considered. First, this study included a relatively small sample, increasing the possibility that nonsignificant relations were due to inflated type II error. However, observation of near-zero effect sizes for the main effects of assault type and the interactions between assault type and PTS symptom severity in predicting change in feelings of disgust and anxiety in response to the assault script increase confidence regarding appropriate retention of the null hypotheses in these cases. Replication of these findings in a larger sample is now needed. Moreover, exclusion of participants with a history of both sexual and non-sexual assault limits the generalizability of these findings. Although deemed necessary to parse apart affective differences associated with sexual and non-sexual assault, polyvictimization is common (Kilpatrick & Acierno, 2003). The current

selection criteria likely reduced the chronicity and severity of assault and abuse histories (Acierno, Resnick, & Kilpatrick, 1997) as well as severity of psychopathology (Kilpatrick & Acierno, 2003). Generalization also is limited by the homogeneity of the sample, which was comprised primarily of Caucasian women. Additionally, although the real-time laboratory-based assessment of affective reactivity overcomes limitations inherent to retrospective self-report, it will be important to assess peritraumatic or immediate posttraumatic affective reactions and follow participants in a longitudinal design in order to understand the temporal trajectory of peritraumatically-conditioned affective responses. Finally, more detailed assessment of disgust is now warranted. Measurement of different domains of disgust reactivity (e.g., interpersonal and sociomoral disgust; Olatunji & Sawchuk, 2005; Rozin et al., 2000) and the focus of disgust (i.e., self versus perpetrator-focused; Badour et al., 2012; Barret, Zahn-Waxler, & Cole, 1993; Power & Dalgleish, 1997) will advance understanding of links between disgust and the sequelae of various types of traumatic events.

These limitations notwithstanding, the present results provide preliminary evidence for a degree of specificity in the association between PTS symptoms and traumatic event-related affective reactivity. The magnitude of the associations between PTS symptom severity and indices of mental contamination and disgust reactions were substantially greater than that of anxious reactions, a finding consistent with research suggesting in addition to (and independent of) anxiety, disgust (Badour et al., 2012; Engelhard et al., 2010; Finucane et al., 2012) and mental contamination (Fairbrother & Rachman, 2004; Olatunji et al., 2008) may be important affective correlates of PTS reactions. Research is now needed to determine the specific role of traumatic event-related mental contamination and disgust in the etiology and/or maintenance of PTS symptomatology. Examination of affective reactivity as a function of traumatic event type also is needed. The current findings suggest examining affective reactivity among samples selected for only one type of traumatic event, or collapsing across multiple traumatic event types, may miss important variability in affective reactivity attributable to characteristics of the traumatic event.

Given the need to replicate the current findings, particularly in light of the small sample, clinical implications of the current results are, at most, tentative. Results of the current study suggest individuals with elevated PTS symptom levels secondary to sexual assault may be particularly likely to experience persistent elevations in disgust and feelings of mental contamination in response to reminders of the experience. Preliminary evidence suggests that as compared to fear, disgust reactions may be relatively resistant to extinction among individuals with other anxiety disorders (McKay, 2006; Olatunji, Smits, Connolly, Willems, & Lohr, 2007; Smits, Telch, & Randall, 2002). However, change in disgust and mental contamination in response to empirically-supported treatments for PTSD have not yet been examined. Research on the potential impact of persistent feelings of disgust and mental contamination in terms of PTSD treatment response is now needed.

Taken as a whole, the results of this study advance our currently limited understanding of the nature of elevated disgust and mental contamination reactions following experiences of traumatic sexual and non-sexual assault experiences. Additional research is needed to further elucidate the nature of the relation between disgust, mental contamination, and psychopathological processes including PTSD.

Acknowledgments

This research was supported, in part, by a National Institute of Mental Health (NIMH) National Research Service Award (F31 MH092994-01) as well as a grant from the Marie Wilson Howells Foundation in the Department of Psychological Science at the University of Arkansas, both awarded to the first author. Additional support for this manuscript was provided by Health Services Research and Development (HSR&D) funds provided to Dr. Babson. The expressed views do not necessarily represent those of NIMH or the Department of Veterans Affairs.

References

- Acierio R, Resnick HS, Kilpatrick DG. Health impact of interpersonal violence 1: Prevalence rates, case identification, and risk factors for sexual assault, physical assault, and domestic violence in men and women. *Behavioral Medicine*. 1997; 23:53–64.10.1080/08964289709596729 [PubMed: 9309345]
- American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 4. Washington, D.C: Author; 1994.
- Badour CL, Bown S, Adams TG, Bunaciu L, Feldner MT. Specificity of fear and disgust experienced during traumatic interpersonal victimization in predicting posttraumatic stress and contamination-based obsessive-compulsive symptoms. *Journal of Anxiety Disorders*. 2012; 26:590–598.10.1016/j.janxdis.2012.03.001 [PubMed: 22465821]
- Badour CL, Feldner MT, Babson KA, Smith RC, Blumenthal H, Trainor CD, Bunaciu L, Olatunji BO. Differential emotional responding to ideographic cues of traumatic interpersonal violence compared to non-interpersonal traumatic experiences. *Journal of Experimental Psychopathology*. 2011; 2:400–417.10.5127/jep.014711
- Barret KC, Zahn-Waxler C, Cole PM. Avoiders versus amenders: Implications for the investigation of guilt and shame during toddlerhood? *Cognition and Emotion*. 1993; 7:481–505.10.1080/02699939308409201
- Blake DD, Weathers FW, Nagy LM, Kaloupek DG, Gusman FD, Charney DS, Keane TM. The development of a clinician-administered PTSD scale. *Journal of Traumatic Stress*. 1995; 8:75–90.10.1002/jts.2490080106 [PubMed: 7712061]
- Boudreaux E, Kilpatrick DG, Resnick HS, Best CL, Saunders BE. Criminal victimization, posttraumatic stress disorder, and comorbid psychopathology among a community sample of women. *Journal of Traumatic Stress*. 1998; 11:665–678.10.1023/A:10244372150444 [PubMed: 9870220]
- Breslau N, Davis GC, Andreski P, Peterson E. Traumatic events and posttraumatic stress disorder in an urban population of young adults. *Archives of General Psychiatry*. 1991; 48(3):216–222. [PubMed: 1996917]
- Brown TA, Campbell LA, Lehman CL, Grisham GR, Mancill RB. Current and lifetime comorbidity of the *DSM-IV* anxiety and mood disorders in a large clinical sample. *Journal of Abnormal Psychology*. 2001; 110:585–599.10.1037//0021-843X.110.4.585 [PubMed: 11727948]
- Cisler JM, Olatunji BO, Lohr JM. Disgust, fear, and the anxiety disorders: A critical review. *Clinical Psychology Review*. 2008; 29:34–46.10.1016/j.cpr.2008.09.007 [PubMed: 18977061]
- Cohen, J. *Statistical power analysis for behavioral sciences*. 2. Hillsdale NJ: Lawrence Erlbaum; 1988.
- Davey, GCL. Disgust. In: Ramachandran, VS., editor. *Encyclopedia of Human Behavior*. San Diego, CA: San Diego Press; 1994.
- Elliott CM, Radomsky AS. Analyses of mental contamination: Part I, experimental manipulations of morality. *Behavior Research and Therapy*. 2009; 47:995–1003.10.1016/j.brat.2009.03.004
- Engelhard IM, Olatunji BO, de Jong PJ. Disgust and the development of posttraumatic stress among soldiers deployed to Afghanistan. *Journal of Anxiety Disorders*. 2011; 25:58–63.10.1016/j.janxdis.2010.08.003 [PubMed: 20800428]
- Fairbrother N, Rachman S. Feelings of mental pollution subsequent to sexual assault. *Behaviour Research and Therapy*. 2004; 42:173–189.10.1016/S0005-7967(03)00108-6 [PubMed: 14975779]
- Feldner MT, Frala J, Badour C, Leen-Feldner EW, Olatunji BO. An empirical test of the association between disgust and sexual assault. *International Journal of Cognitive Therapy*. 2010; 3:11–22.10.1521/ijct.2010.3.1.11
- Finucane AM, Dima A, Ferreira N, Halvorsen M. Basic emotion profiles in healthy, chronic pain, depressed and PTSD individuals. *Clinical Psychology & Psychotherapy*. 2012; 19:14–24.10.1002/cpp.733 [PubMed: 21243706]
- Foa EB, Huppert JD, Leiberg S, Langner R, Kichic R, Hajcak G, Salkovskis PM. The Obsessive-Compulsive Inventory: Development and validation of a short version. *Psychotherapy Research*. 2002; 16:12–25.10.1037/1040-3590.14.4.485

- Foa, EB.; Rothbaum, BO. Treating the trauma of rape: Cognitive behavioral therapy for PTSD. New York: Guilford Press; 2001.
- Foy DW, Sippel RC, Rueger DB, Carroll EM. Etiology of posttraumatic stress disorder in Vietnam veterans: Analysis of premilitary, military, and combat exposure influences. *Journal of Consulting and Clinical Psychology*. 1984; 52:79–87.10.1037/0022-006X.52.1.79 [PubMed: 6699251]
- Freyd M. The graphic rating scale. *Journal of Educational Psychology*. 1923; 14:83–102.10.1037/h0074329
- Herba JK, Rachman S. Vulnerability to mental contamination. *Behaviour Research and Therapy*. 2007; 45:2804–2812.10.1016/j.brat.2007.07.010 [PubMed: 17765866]
- Holmbeck GN. Post-hoc probing of significant moderational and mediational effects in studies of pediatric populations. *Journal of Pediatric Psychology*. 2002; 27:87–96.10.1093/jpepsy/27.1.87 [PubMed: 11726683]
- Hopper JW, Frewen PA, Sack M, Lanius RA, van der Kolk BA. The Responses to Script-Driven Imagery Scale (RSDI): Assessment of state posttraumatic symptoms for psychobiological and treatment research. *Journal of Psychopathology and Behavioral Assessment*. 2007; 29:249–268.10.1007/s10862-007-9046-0
- Huppert JD, Moser JS, Gershuny BS, Riggs DS, Spokas M, Filip J, Foa EB. The relationship between obsessive-compulsive and posttraumatic stress symptoms in clinical and non-clinical samples. *Journal of Anxiety Disorders*. 2005; 19:127–136.10.1016/j.janxdis.2004.01.001 [PubMed: 15488372]
- Kilpatrick DG, Acierno R. Mental health needs of crime victims: Epidemiology and outcomes. *Journal of Traumatic Stress*. 2003; 16:119–132.10.1023/A:1022891005388 [PubMed: 12699200]
- Kirk RE. Practical significance: A concept whose time has come. *Educational and Psychological Measurement*. 1996; 56:746–759.10.1177/001316449056005002
- Lang A, Kennedy JCM, Stein MB. Anxiety sensitivity and PTSD among female victims of intimate partner violence. *Depression and Anxiety*. 2002; 16:77–83.10.1002/da.10062 [PubMed: 12219339]
- Lang PJ, Levin DN, Miller GA, Kozak MJ. Fear behavior, fear imagery, and the psychophysiology of emotion: the problem of affective response integration. *Journal of Abnormal Psychology*. 1983; 92:276–306.10.1037/0021-843X.92.3.276 [PubMed: 6619405]
- McKay D. Treating disgust reactions in contamination-based obsessive-compulsive disorder. *Journal of Behavior Therapy and Experimental Psychiatry*. 2006; 37:53–59.10.1016/j.jbtep.2005.09.005 [PubMed: 16253206]
- Mohlman J, Zinbarg RE. The structure and correlates of anxiety sensitivity in older adults. *Psychological Assessment*. 2000; 12:440–446.10.1037//1040-3590.12.4.440 [PubMed: 11147114]
- Norris F. Epidemiology of trauma: Frequency and impact of different potentially traumatic events on different demographic groups. *Journal of Consulting and Clinical Psychology*. 1992; 60:409–418.10.1037/0022-006X.60.3.409 [PubMed: 1619095]
- Olatunji BO, Babson KA, Smith RC, Feldner MT, Connolly KM. Gender as a moderator of the relation between PTSD and disgust: A laboratory test employing individualized script-driven imagery. *Journal of Anxiety Disorders*. 2009; 23:1091–1097.10.1016/j.janxdis.2009.07.012 [PubMed: 19647980]
- Olatunji BO, Cisler JM, Deacon BJ, Connolly K, Lohr JM. The Disgust Propensity and Sensitivity Scale-Revised: Psychometric properties and specificity in relation to anxiety disorder symptoms. *Journal of Anxiety Disorders*. 2007; 21:917–930.10.1016/j.anxdis.2006.12.005
- Olatunji BO, Cisler J, McKay D, Phillips ML. Is disgust associated with psychopathology? Emerging research in anxiety disorders. *Psychiatry Research*. 2010; 175:1–10.10.1016/j.psychres.2009.04.007 [PubMed: 19969378]
- Olatunji BO, Elwood L, Williams N, Lohr JM. Feelings of mental pollution and PTSD symptoms in victims of sexual assault. The mediating role of trauma-related cognitions. *Journal of Cognitive Psychotherapy*. 2008; 22:37–47.10.1891/0889.8391.22.1.37
- Olatunji BO, Sawchuk CN. Disgust: Characteristic features, social manifestations, and clinical implications. *Journal of Social and Clinical Psychology*. 2005; 27:932–962.10.1521/jscp.2005.24.7.932

- Olatunji BO, Smits JA, Connolly KM, Willems J, Lohr JM. Examination of the rate of decline in fear and disgust during exposure to threat-relevant stimuli in blood-injection-injury phobia. *Journal of Anxiety Disorders*. 2007; 21:445–455.10.1016/j.janxdis.2006.05.001 [PubMed: 16806801]
- Orr SP, Roth WT. Psychophysiological assessment: Clinical applications for PTSD. *Journal of Affective Disorder*. 2000; 61:225–240.10.1016/S0165-0327(00)00340-2
- Osman A, Gutierrez PM, Smith K, Fang Q, Lozano G, Devine A. The Anxiety Sensitivity Index-3: Analyses of dimensions, reliability estimates, and correlates in nonclinical samples. *Journal of Personality Assessment*. 2010; 92:45–52.10.1080/00223890903379332 [PubMed: 20013455]
- Petrak J, Doyle A-M, Williams L, Buchan L, Forster G. The psychological impact of sexual assault: A study of female attenders of a sexual health psychology service. *Sexual and Marital Therapy*. 1997; 12:339–345.10.1080/02674659808408177
- Pitman RK, Orr SP, Forgue DF, Altman B, Je Jong JB, Herz LR. Psychophysiological responses to combat imagery of Vietnam veterans with posttraumatic stress disorder versus other anxiety disorders. *Journal of Abnormal Psychology*. 1990; 99:49–54. [PubMed: 2307766]
- Pitman R, Orr S, Forgue D, de Jong J, Claiborn J. Psychophysiological assessment of posttraumatic stress disorder imagery in Vietnam combat veterans. *Archives of General Psychiatry*. 1987; 44:970–975.10.1037/0021-843X.99.1.49 [PubMed: 3675137]
- Power, M.; Dalgleish, T. *Cognition and emotion: From order to disorder*. East Sussex, UK: Psychology Press; 1997.
- Rachman S. Fear of contamination. *Behaviour Research and Therapy*. 2004; 42:1227–1255.10.1016/j.brat.2003.10.009 [PubMed: 15381436]
- Rachman, S. *Fear of contamination: Assessment and treatment*. Oxford University Press; Oxford, UK: 2006.
- Radomsky AS, Elliott CM. Analyses of mental contamination: Part II, individual differences. *Behaviour Research and Therapy*. 2009; 47:1004–1011.10.1016/j.brat.2009.08.004 [PubMed: 19748072]
- Rozin, P.; Haidt, J.; McCauley, CR. Disgust. In: Lewis, M.; Haviland-Jones, JM., editors. *Handbook of Emotions*. 2. New York: Guilford Press; 2000. p. 637–653.
- Rüsch N, Schulz D, Valerius G, Steil R, Bohus M, Schmahl C. Disgust and implicit self-concept in women with borderline personality disorder and posttraumatic stress disorder. *European Archives of Clinical Neuroscience*. 2011; 261:369–376.10.1007/s00406-010-0174-2
- Ruscio AM, Ruscio J, Keane TM. The latent structure of posttraumatic stress disorder. A taxometric investigation of reactions to extreme stress. *Journal of Abnormal psychology*. 2002; 111:290–301.10.1037//001-843X.111.2.290 [PubMed: 12003450]
- Shin LM, McNally RJ, Kosslyn SM, Thompson WL, Rauch SL, Alpert NM, Metzger LJ, Lasko NB, Orr SP, Pitman RK. Regional cerebral blood flow during script-driven imagery in childhood sexual abuse-related PTSD: A PET investigation. *American Journal of Psychiatry*. 1999; 156:575–584. [PubMed: 10200737]
- Shin LM, Orr SP, Carson MA, Rauch SL, Macklin ML, Lasko NB, Pitman RK. Regional cerebral blood flow in the amygdala and medial prefrontal cortex during traumatic imagery in male and female Vietnam veterans with PTSD. *Archives of General Psychiatry*. 2004; 61:168–176.10.1001/archpsyc.61.2.168 [PubMed: 14757593]
- Smits JAJ, Telch MJ, Randall PK. An examination of the decline in fear and disgust during exposure-based treatment. *Behaviour Research & Therapy*. 2002; 40:1243–1253.10.1016/S0005-7967(01)00094-8 [PubMed: 12384321]
- Solomon Z, Bleich A, Koslowsky M, Kron S, Lerer B, Waysman M. Post-traumatic stress disorder: Issues of co-morbidity. *Journal of Psychiatric Research*. 1991; 25:89–94.10.1016/0022-3956(91)90002-R [PubMed: 1941712]
- Stein DJ, Liu Y, Shapira NA, Goodman WK. The psychobiology of obsessive-compulsive disorder: How important is the role of disgust? *Current Psychiatry Reports*. 2001; 3:281–287.10.1007/s11920-001-0020-3 [PubMed: 11470034]
- Taylor S. Anxiety sensitivity and its implications for understanding and treating PTSD. *Journal of Cognitive Psychotherapy*. 2003; 17:179–186.10.1891/jcop.17.2.179.57431

- Taylor S, Zvolensky MJ, Cox BJ, Deacon B, Heimberg RG, Ledley DR, Cardenas SJ. Robust dimensions of anxiety sensitivity: Development and initial validation of the Anxiety Sensitivity-3. *Psychological Assessment*. 2007; 19:176–188.10.1037/1040-3590.19.2.176 [PubMed: 17563199]
- van Overveld WJM, de Jong PJ, Peters ML, Cavanagh K, Davey GCL. Disgust propensity and disgust sensitivity: Separate constructs that are differentially related to specific fears. *Personality and Individual Differences*. 2006; 41:1241–1252.10.1016/j.paid.2006.04.021
- Weathers FW, Keane TM, Davidson JR. Clinician-Administered PTSD Scale: A review of the first ten years of research. *Depression and Anxiety*. 2001; 13:132–156.10.1002/da.1029 [PubMed: 11387733]
- Weathers FW, Ruscio AM, Keane TM. Psychometric properties of nine scoring rules for the Clinician-Administered Posttraumatic Stress Disorder Scale. *Psychological Assessment*. 1999; 11:124–133.10.1037/1040-3590.11.2.124

Highlights

- We assessed real-time assault-related feelings of mental contamination, disgust, and anxiety.
- Sexually or physically assaulted women completed a script-driven imagery procedure.
- Sexual assault and posttraumatic stress predicted increased disgust.
- Posttraumatic stress related to mental contamination only among sexually assaulted women.
- Assault type was not associated with differences in anxiety reactivity.

Table 1

Descriptive Information for Primary Variables Examined as a Function of Group

	<u>Sexual Assault</u>		<u>Non Sexual Assault</u>		<i>t</i>
	Group (<i>n</i> =22)		Group (<i>n</i> = 18)		
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	
Age	29.86	15.93	26.11	11.12	0.84
Posttraumatic Stress Symptoms	28.00	19.26	35.11	21.91	-1.09
Obsessive-Compulsive Symptoms	11.77	14.72	14.72	13.47	-0.81
Script Vividness: Neutral	74.05	16.64	76.53	20.64	-0.41
Script Vividness: Assault	82.82	13.92	78.94	25.58	0.61
Feelings of Dirtiness					
Pre-Neutral Script	1.36	0.58	1.22	0.43	0.86
Post-Neutral Script	1.23	0.43	1.61	1.04	-1.47
Δ Feelings of Dirtiness: Neutral	-0.14	0.35	0.39	0.78	-2.65*
Pre-Assault Script	1.32	0.58	1.56	1.04	-0.92
Post-Assault Script	2.27	1.42	1.83	1.04	1.09
Δ Feelings of Dirtiness: Assault	0.95	1.09	0.28	0.57	2.52*
Urges to Wash					
Pre-Neutral Script	1.29	0.56	1.56	0.93	-1.11
Post-Neutral Script	1.12	0.34	1.48	0.85	-1.69
Δ Urges to Wash: Neutral	-0.17	0.33	-0.08	0.31	-0.94
Pre-Assault Script	1.17	0.43	1.53	0.92	-1.52
Post-Assault Script	1.66	1.09	1.53	0.97	0.40
Δ Urges to Wash: Assault	0.49	0.86	0.00	0.24	2.56*
Disgust					
Pre-Neutral Script	6.41	11.55	10.28	24.02	-0.67
Post-Neutral Script	3.00	5.52	3.17	9.30	-0.70
Δ Disgust: Neutral	-3.41	7.61	-7.11	22.21	0.73
Pre-Assault Script	6.00	13.84	5.00	9.98	0.26
Post-Assault Script	45.36	30.30	26.44	34.13	1.86 ⁺
Δ Disgust: Assault	39.37	25.90	21.44	31.95	1.96 ⁺

	<u>Sexual Assault</u>		<u>Non Sexual Assault</u>		<i>t</i>
	Group (<i>n</i> =22)		Group (<i>n</i> = 18)		
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	
Anxiety					
Pre-Neutral Script	27.41	28.27	24.94	25.30	0.29
Post-Neutral Script	16.27	23.17	13.56	18.48	0.40
Δ Anxiety: Neutral	-11.14	14.75	-11.39	22.30	0.04
Pre-Assault Script	22.91	27.13	14.06	19.86	1.15
Post-Assault Script	43.82	29.40	34.33	34.24	0.94
Δ Anxiety: Assault	20.91	18.38	20.28	25.32	0.09

Note: Δ = Change (post-script–pre-script).

*
p < .05,

+
p < .10.

Table 2

Zero-Order Correlations among Primary Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	-	-.15	-.15	.08	.07	.20	-.22	.09	-.11	.14	-.01	.01	.08
2. PTS Symptoms	-	-	.30 ⁺	-.04	.05	-.05	.39 [*]	-.20	.34 [*]	-.50 ^{**}	.46 ^{**}	-.41 ^{**}	.37 [*]
3. OC Symptoms	-	-	-	-.18	-.37 [*]	.08	.24	-.16	.30 ⁺	-.05	-.14	-.11	.12
4. Vividness: Neutral	-	-	-	-	.52 ^{**}	.09	-.28	.25	-.18	-.15	-.03	.08	.05
5. Vividness: Assault	-	-	-	-	-	-.05	-.02	-.05	-.01	-.16	.22	-.07	.10
6. Δ - Dirtiness: Neutral	-	-	-	-	-	-	-.28	.27	-.18	.06	-.14	.07	.00
7. Δ - Dirtiness: Assault	-	-	-	-	-	-	-	-.43 ^{**}	.80 ^{**}	-.42 ^{**}	.80 ^{**}	-.08	.27
8. Δ - Urges to Wash: Neutral	-	-	-	-	-	-	-	-	-.37 [*]	.13	-.01	.04	.22
9. Δ - Urges to Wash: Assault	-	-	-	-	-	-	-	-	-	-.17	.22	-.20	.15
10. Δ - Disgust: Neutral	-	-	-	-	-	-	-	-	-	-	-.36 [*]	-.08	.10
11. Δ - Disgust: Assault	-	-	-	-	-	-	-	-	-	-	-	.03	.21
12. Δ - Anxiety: Neutral	-	-	-	-	-	-	-	-	-	-	-	-	-.31 [*]
13. Δ - Anxiety: Assault	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: Δ = Change (post script – pre-script); PTS = posttraumatic stress; OC = obsessive-compulsive.

**
 $p < .01$,*
 $p < .05$,+
 $p < .10$.

Table 3

Assault Type and Posttraumatic Stress Symptoms as Predictors of Changes in Traumatic Event-Related Feelings of Dirtiness, Urges to Wash, Disgust, and Anxiety

	ΔR^2	t	β	sr^2
Model 1: Predicting Change in Feelings of Dirtiness to the Assault Script				
<i>Step 1</i>	0.15 ⁺			
OC Symptoms		1.74	0.26	0.07 ⁺
Δ - Dirtiness: Neutral		-1.99	-0.30	0.09 ⁺
<i>Step 2</i>	0.23 ^{**}			
PTS Symptoms		2.78	0.40	0.14 ^{**}
Assault Type		-2.71	-0.41	0.13 [*]
<i>Step 3</i>	0.09 [*]			
Assault Type by PTS Symptoms		-2.39	-1.01	0.09 [*]
Model 2: Predicting Change in Urges to Wash to the Assault Script				
<i>Step 1</i>	0.20 [*]			
OC Symptoms		1.67	0.25	0.06
Δ - Urges to Wash: Neutral		-2.21	-0.18	0.11 [*]
<i>Step 2</i>	0.20 ^{**}			
PTS Symptoms		2.10	0.30	0.08 [*]
Assault Type		-2.97	-0.41	0.15 ^{**}
<i>Step 3</i>	0.11 [*]			
Assault Type by PTS Symptoms		-2.74	-1.26	0.11 [*]
Model 3: Predicting Change in Disgust to the Assault Script				
<i>Step 1</i>	0.16 [*]			
OC Symptoms		-1.07	-0.16	0.03
Δ - Disgust: Neutral		-2.43	-0.37	0.13 [*]
<i>Step 2</i>	0.29 ^{**}			
PTS Symptoms		3.42	0.53	0.18 ^{**}
Assault Type		-2.96	-0.38	0.14 ^{**}
<i>Step 3</i>	0.00			
Assault Type by PTS Symptoms		0.35	0.15	0.00
Model 4: Predicting Change in Anxiety to the Assault Script				
<i>Step 1</i>	0.11			
OC Symptoms		0.55	0.09	0.01
Δ - Anxiety: Neutral		-1.94	-0.30	0.09 ⁺
<i>Step 2</i>	0.07			
PTS Symptoms		1.92	0.36	0.08 ⁺
Assault Type		-0.45	-0.07	0.00

	ΔR^2	t	β	sr^2
<i>Step 3</i>	0.00			
Assault Type by PTS Symptoms		0.37	0.19	0.00

Note: $N = 40$; OC = obsessive-compulsive PTS = posttraumatic stress; Δ = Change (post-script – pre-script).

**
 $p < .01$;

*
 $p < .05$;

+
 $p < .10$.