The effect of safety behaviour on the acceptability of exposure therapy

for contamination fear

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ABSTRACT

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Compulsive washing and contamination fear are among the most common symptoms of obsessive-compulsive disorder (OCD). Research suggests that exposure and response prevention (ERP) is effective for OCD; however, ERP is prone to dropouts and refusals, and a substantial proportion of clients do not receive the care they need. A proposed solution involves the judicious use of safety behaviour to enhance the acceptability of ERP. The current study aimed to test this proposed solution. Participants were 70 undergraduate students who completed two brief exposure-based treatment sessions for contamination fear, one with safety behaviour and one without. Following each session, participants rated the acceptability of the treatment in which they had just engaged. Exposure with safety behaviour (ESB) was rated as significantly more acceptable than exposure and response prevention (ERP). Furthermore, subjective fear ratings were significantly lower and behavioural approach to a series of contaminants was significantly greater in the ESB condition. Results are discussed in terms of the conceptualization of safety behaviour as a maintaining factor of anxiety symptomatology and the potential benefits of safety behaviour in cognitive-behavioural therapy (CBT).

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Obsessive-compulsive disorder (OCD) is a debilitating psychiatric disorder, affecting approximately 1-2.5% of the population (APA, 2000). The disorder is heterogeneous in nature (Radomsky & Taylor, 2005), encompassing a wide variety of obsessions (i.e., intrusive thoughts, images, or impulses) and compulsions (i.e., behaviour aimed at preventing negative outcomes and/or decreasing anxiety). Among the most common symptoms of OCD are compulsive washing and contamination-related OCD (Rachman, 2004). For example, in a sample of 560 individuals with OCD, 50% had contamination fears (Rasmussen & Eisen, 1992). In addition to their prevalence, contamination fears are persistent and unrelenting. Once the threat of contamination has been realized, individuals may engage in compulsive washing until they achieve adequate cleanliness, which can be difficult to attain (Wahl, Salkovskis, & Cotter, 2008).

Due to its widespread and debilitating nature, it is important to develop effective treatments for contamination-related OCD. A controlled trial found that clients with compulsive cleaning rituals responded worse to treatment than did clients with other forms of OCD (Coelho & Whittal, 2001). Exposure and response prevention (ERP) is frequently used in evidence-based treatment for OCD (Cognitive-Behavioural Therapy, CBT). ERP for contamination fear involves repeatedly exposing the client to feared contaminants while preventing engagement in compulsive behaviour (e.g., washing), which gradually degrades the fear response to the contaminants (Meyer, 1966; Barlow, 2002; Clark, 2004). While ERP is effective for OCD (e.g., Foa et al., 2005), too many clients refuse the treatment entirely or drop out due to exhaustion and/or symptom

exacerbation (Rachman, 2004). For example, in a randomized-controlled trial of ERP for OCD with and without clomipramine, Foa and colleagues (2005) reported that 14% of participants declined study participation altogether due to unwillingness to receive ERP, 22% withdrew upon randomization into the ERP condition, and an additional 22% dropped out during ERP. Other randomized-controlled trials with similar designs have reported comparable rates of refusals and dropouts from CBT (e.g., Barlow, Gorman, Shear, & Woods, 2000). This means that a substantial proportion of clients do not receive effective treatment for their OCD.

How can ERP be modified to enhance its acceptability without detracting from its efficacy? Some suggest that the *judicious* use of safety behaviour, especially in the early stages of treatment when dropouts and refusals are most likely (Rachman, 2004), may be the answer (Parrish, Radomsky, & Dugas, 2008; Rachman, Radomsky, & Shafran, 2008). Safety behaviour is defined as overt or covert avoidance strategies carried out in feared situations to minimize perceived threat (Salkovskis, Clark, & Gelder, 1996). Within the context of contamination-related OCD, some examples of safety behaviour include overt behaviour such as washing or covert strategies such as avoiding eye contact with perceived contaminants. Many cognitive-behavioural theorists assert that safety behaviour interferes with exposure therapy such that it facilitates the avoidance of feared outcomes and leads to misattributions of safety in threatening situations (Salkovskis, 1991). For example, individuals with panic disorder may carry safety aids like water bottles or cellular phones. By relying on these safety aids, these individuals may falsely believe that the safety aids themselves prevented their panic attacks or other feared catastrophes.

Several empirical studies have shown that safety behaviour indeed interferes with the benefits of exposure therapy (e.g., Salkovskis, Clark, Hackmann, Wells, & Gelder, 1999; Kim, 2005; for a review, see Helbig-Lang & Petermann, 2010). Findings have generally shown that participants who are discouraged from using safety behaviour during exposure therapy fare significantly better than participants permitted to use it. For example, Olatunji, Etzel, Tomarken, Ciesielski, and Deacon (2011) found that participants who were instructed to engage in health-related safety behaviour (e.g., taking two or more showers daily) reported greater increases in health anxiety, hypochondriacal beliefs, contamination fear, and avoidance than participants who monitored their normal use of safety behaviour. Additionally, research suggests that even the perceived availability of safety behaviour may impact the benefits of exposure. Powers, Smits, and Telch (2004) randomized individuals with claustrophobia to exposure, exposure plus safety behaviour, and exposure plus the availability of safety behaviour (i.e., use it "only if you must") and found that participants in the exposure condition reported less suffocation fears and more clinically-significant change at follow-up than participants in both safety behaviour conditions. However, it should be noted that a recent study failed to replicate these results (see Sy, Dixon, Lickel, Nelson, & Deacon, 2011).

Despite convincing evidence for the detrimental effects of safety behaviour on treatment outcome, some theorize that the *judicious* use of safety behaviour may actually enhance the benefits and acceptability of exposure therapy (Parrish et al., 2008; Rachman et al., 2008). There is growing empirical support for this claim, with recent studies suggesting that exposure with safety behaviour (ESB) is comparably effective to exposure therapy. In a recent pilot study, Rachman, Shafran, Radomsky, and Zysk (2011)

found that nonclinical participants who used safety behaviour (i.e., hygienic wipes) during exposures to a feared contaminant reported comparable if not greater reductions in contamination, fear, danger, and disgust as compared to participants who refrained from using safety behaviour. These findings have been replicated by an independent team of investigators in a subclinical sample (van den Hout, Engelhard, Toffolo, & van Uijen, 2011). In another study, Milosevic and Radomsky (2008) compared exposure to a live snake with and without safety gear (e.g., gloves, goggles) and found that participants using safety gear approached the snake more rapidly and reported comparable fear reductions and cognitive change at post-treatment. A related study found that participants with spider phobia randomized to ESB reported similar reductions in subjective distress and negative beliefs about spiders compared to participants in the exposure-only condition (Hood, Antony, Koerner, & Monson, 2010).

Of course, these findings are in direct opposition to current cognitive-behavioural conceptualizations of anxiety disorders. However, a closer look at the literature reveals that safety behaviour may not actually prevent the acquisition of threat-relevant information that ultimately leads to cognitive change. Earlier work by Rachman, Craske, Tallman, and Solymon (1986) compared the effects of exposure therapy and exposure plus instructions to escape the feared situation among individuals with agoraphobia. No group differences on any measures of agoraphobia were found, including perceived control and estimates of danger. Coupled with more recent findings demonstrating no differences between exposure therapy and ESB on measures of cognitive change (Milosevic & Radomsky, 2008; Hood et al., 2010), safety behaviour may benefit from reconceptualization. Furthermore, the ability to approach the feared stimulus is a

necessary component of the acquisition of threat-relevant information during exposure (Mowrer, 1960). Because recent studies have shown that safety gear is associated with closer (Milosevic & Radomsky, 2012) and more rapid (Milosevic & Radomsky, 2008; Hood et al., 2010) approach to feared stimuli, it could be that safety behaviour actually facilitates essential learning processes during exposure therapy.

While controversial, the *judicious* use of safety behaviour in the early stages of exposure treatment may enhance its acceptability (Rachman et al., 2008). Of course, empirical research to support this claim is warranted (and is likely only meaningful if outcome research shows that the *judicious* use of safety behaviour does not negatively impact treatment effectiveness). Treatment acceptability has been described as the degree to which an individual perceives a treatment procedure to be fair, reasonable, appropriate, and un-intrusive for a given clinical problem (Kazdin, 1980; O'Brien & Karsh, 1991). For anxiety disorders, the literature suggests that cognitive-behavioural therapy (CBT) may be more acceptable than pharmacotherapy (Hofmann et al., 1998; Huppert, Franklin, and Foa, 2003). For example, in a sample of clinically anxious individuals, participants rated CBT as more acceptable than pharmacotherapy and more participants ranked CBT as their first choice even though a large percentage of the sample had a recent history of pharmacotherapy, not psychotherapy (Deacon & Abramowitz, 2005). Similarly, another study found that among 14 treatments available for PTSD, cognitive therapy, cognitive therapy with exposure, imaginal exposure, psychoeducation, and *in vivo* exposure were ranked the highest (all of which are elements of CBT; Tarrier, Liversidge, & Gregg, 2006). Finally, in a recent investigation comparing vignette descriptions of CBT with and

without safety behaviour, participants rated CBT with safety behaviour as more acceptable than CBT alone (Milosevic & Radomsky, 2012).

Taken together, the empirical evidence suggests that CBT may be the preferred treatment for a variety of anxiety disorders. If this is the case, why are so many clients refusing the treatment entirely or dropping out after a few sessions? Clearly more work is needed to improve the acceptability of CBT and exposure therapy. Using safety behaviour to enhance treatment acceptability is a sensible solution on a theoretical level; however, it must be empirically tested. To this end, the first goal of the current study was to assess the acceptability of exposure therapy for contamination fear with and without the use of safety behaviour. First, it was hypothesized that exposure with safety behaviour (ESB) would be rated as more acceptable than exposure and response prevention (ERP). It was further hypothesized that subjective fear ratings would be lower and behavioural approach to a series of contaminants would be greater in the ESB condition compared to the ERP condition.

The second goal of the proposed study was to assess the acceptability of ESB and ERP among individuals with varying levels of contamination fear. Here, it was hypothesized that individuals reporting high levels of contamination fear would rate ESB as significantly more acceptable than ERP compared to individuals low on contamination fear. In other words, it was hypothesized that the difference in acceptability ratings between ESB and ERP would be predicted by level of contamination fear.

Of course, before credible research can be conducted, valid and reliable measures that assess treatment acceptability and adherence are needed. There is a paucity of measures available to assess this construct, and most (if not all) do not inquire

specifically about treatment adherence. Therefore, the third goal of the proposed study was to validate a measure called the Treatment Acceptability Scale (TXA; Milosevic & Radomsky, 2012), which assesses treatment acceptability and adherence. This measure was administered along with a published scale of treatment acceptability (the Endorsement and Discomfort Scale, EDS; Tarrier et al., 2006). Here, it was hypothesized that the TXA would have acceptable to excellent psychometric properties as assessed by Cronbach's alpha, convergent validity with the EDS and the Credibility/Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000), and divergent validity with the State-Trait Anger Expression Inventory-2 (STAXI-2; Spielberger, 1999).

Method

Participants

Participants were 81 undergraduate students at Concordia University who participated in this study in exchange for course credit or entry into a draw for cash prizes. The only inclusion/exclusion criteria were ability to understand, read, and communicate in English and no prior cognitive-behavioural therapy (CBT). The majority of participants were female (84%) and ranged in age from 17 to 63 ($M = 23.85$, $SD = 7.72$) years. Forty of the participants identified English as their first language (49%) and 48 reported speaking English at home (59%), either as the only spoken language or in combination with other languages. All participants completed both treatment conditions (i.e., ESB and ERP).

Measures

*Behavioural Approach Test (*BAT*).* The BAT is a commonly used behavioural index of fear. In the current study, it consisted of presenting participants with two

contaminants during each exposure session: one was moderately contaminated (i.e., dirty laundry, a dirt mixture; see Materials) and one was extremely contaminated (i.e., a dirty toilet, a dirty bedpan; see Materials). After each stimulus presentation and accompanied description (see Materials), participants were asked to approach the contaminant as close as they were able. The distance was coded on a 6-point hierarchy, ranging from approaching the contaminant and smelling it from within three feet to touching the contaminant and then rubbing hands together (see Appendix C for a detailed description of the BAT). This BAT has been used in research on compulsive washing (see Cougle, Wolitzy-Taylor, Lee, & Telch, 2007). The number of steps completed served as the measure of behavioural approach for each contaminant.

Beck Anxiety Inventory (BAI; Beck & Steer, 1990) is a 21-item questionnaire that assesses general symptoms of anxiety. Participants are asked to rate the degree to which their anxious symptoms bother them on a 4-point Likert scale (*0 = Not at all*; *3 = Severely, I could barely stand it*). The BAI has high internal consistency (α = .92) and test-retest reliability (*r* = .75) and shows high convergent and discriminant validity in clinical and non-clinical samples (Beck, Epstein, Brown, & Steer, 1988). The BAI showed excellent internal consistency in the current sample (α = .92).

Contamination Rating. The contamination rating served as the manipulation check for this study. Participants were asked to rate the perceived level of contamination of each contaminant after completing the BAT for that particular contaminant. The contamination rating went as follows: "On a scale of 0-100, 0 being not at all contaminated and 100 being the most you can imagine, how contaminated is the object you just touched?"

Credibility/Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000) is a 6-item questionnaire that assesses perceived credibility and expectancy of a given treatment. The credibility items are rated on a 9-point Likert scale (*1 = Not at all useful/logical*; *9 = Very useful/logical*), while the expectancy items are rated on an 11-point percentage scale (*0% - 100%* improvement in symptoms). The authors reported adequate internal consistency (α = .84) and test-retest reliability (*r* = .83). The CEQ was administered with the TXA to assess convergent validity of the TXA. The CEQ showed adequate internal consistency in the current sample (α = .71 for ESB and α = .69 for ERP).

Endorsement and Discomfort Scale (EDS; Tarrier et al., 2006) is a 10-item questionnaire developed for research on treatment acceptability. It assesses treatment preference and acceptability on a variety of dimensions, including suitability, tolerability, and reasonableness, among others. Participants are asked to rate the degree to which they agree with each of the statements about a given treatment on a 9-point Likert scale (*1 = Disagree strongly*; *9 = Agree strongly*). The authors reported that the first 9 items of the EDS loaded onto a single factor they termed treatment "endorsement," and the last item loaded onto a factor they conceptualized as treatment "discomfort." The EDS was administered with the TXA to assess convergent validity of the TXA. The EDS showed excellent internal consistency in the current sample (α = .92 for ESB and α = .93 for ERP).

OCD Treatment History Questionnaire (OC-THQ; Stobie, Taylor, Quigley, Ewing, & Salkovskis, 2007) is a 10-item questionnaire that assesses previous psychotherapy for OCD, including duration, focus, and specific techniques (e.g.,

exposure) to verify previous cognitive-behavioural therapy (CBT). For the purposes of the current study, this questionnaire was adapted to make it more general (i.e., not exclusively for previous OCD treatment). To meet minimum criteria for previous CBT, the therapy had to be 6 or more sessions with at least 40 minutes per session and had to include exposure, homework, a focus on the problem and not on childhood, and a therapist who was not silent for most of the sessions. The authors reported that the OC-THQ effectively discriminated individuals who had previously received CBT from those who had received other therapeutic interventions.

State-Trait Anger Expression Inventory-2 (STAXI-2; Spielberger, 1999) is a 57-item questionnaire that assesses the intensity of anger as an emotional state (State Anger) and as a personality trait (Trait Anger). For the purposes of the current study, only the State Anger subscale was administered along with the TXA for analyses of divergent validity. The State Anger subscale consists of 15 items and participants are asked to rate how angry they feel right now on a 4-point Likert scale (*1 = Not at all*; *4 = Very much so*). The STAXI-2 has shown excellent convergent and divergent validity, as well as high internal consistency when administered in research contexts ($\alpha = .94$; e.g., Patterson, Kerrin, Wileyto, & Lerman, 2008). The State Anger subscale showed adequate internal consistency in the current sample ($\alpha = .83$ for ESB and $\alpha = .85$ for ERP).

*Subjective Units of Distress Scale (*SUDS; Wolpe, 1958) is a widely-used measure of subjective fear during behaviour therapy. For the current study, participants were asked to rate how fearful they felt on a scale from 0 to 100, 0 being neutral and 100 being the worst distress they can imagine. The SUDS was administered at four time points during each exposure session: before approaching the two types of contaminants (i.e.,

moderately and extremely contaminated; the Anticipatory SUDS rating) and while touching the contaminants (i.e., after reaching the last step in the BAT they could attain; the Peak SUDS rating).

Treatment Acceptability Scale (TXA; Milosevic & Radomsky, 2012) is a 10-item questionnaire designed to assess treatment acceptability on a variety of dimensions, including adherence, perceived intrusiveness, and tolerability, among others. Items are rated on a 7-point Likert-type scale (*1 = Disagree strongly*; *7 = Agree strongly*) to assess if participants agree with a variety of statements about the treatment about which they have just read a descriptive vignette. For the purposes of the current study, the TXA was administered along with the EDS to assess the psychometric properties of the TXA, but the descriptive vignettes were not provided. Rather, participants were asked to respond to each item with regards to the exposure session in which they had just engaged (i.e., ESB or ERP). The authors have reported excellent internal consistency for the TXA (α = .87; Milosevic & Radomsky, 2010). The TXA showed excellent internal consistency in the current sample (α = .88 for ESB and α = .86 for ERP).

Vancouver Obsessional Compulsive Inventory (VOCI; Thordarson et al., 2004) is a 55-item questionnaire that assesses a variety of OCD symptoms, including contamination fear. Participants are asked to rate the degree to which the statements are true of them on a 5-point Likert scale (*0 = Not at all*; *4 = Very much*). The VOCI has shown excellent internal consistency in student (α = .96) and clinical samples (α = .94), as well as convergent and divergent validity (Radomsky et al., 2006; Thordarson et al., 2004). For the purposes of the current study, only the contamination subscale of the

VOCI was administered, and it demonstrated excellent internal consistency in the current sample (α = .91).

Materials

Bedpan. A bedpan filled with dilute apple juice was used as one of the extremely contaminated objects. When presented with the bedpan, participants were told, "This is a dirty bedpan." The apple juice was diluted to decrease the juice's smell, and one spray of all-purpose cleaner was added to eliminate any residual odor. This stimulus has been used in previous research on contamination-related OCD (see Olatunji, Lohr, Sawchuck, & Tolin, 2007).

Dirt mixture. A mixture of potting soil, dead crickets, and cat hair was placed in a shallow plastic box and used as one of the moderately contaminated objects. When presented with the dirt mixture, participants were told, "This is a mixture of dirt, dead insects, and animal hair." This stimulus has been used in previous research on compulsive washing (see Cougle et al., 2007).

Dirty laundry. A pile of dirty underwear, socks, t-shirts, and rags was placed in a laundry basket and used as one of the moderately contaminated objects. When presented with the laundry, participants were told, "This is a box of dirty laundry. It includes socks, underwear, old t-shirts, and rags. Some of these items may have been touched with bodily fluids." This stimulus has been used in previous research on compulsive washing (see Cougle et al., 2007).

Toilet. A porcelain toilet was smeared with potting soil and chocolate and used as one of the extremely contaminated objects. When presented with the toilet, participants

were told, "This is a dirty toilet." This stimulus has been used in previous research on compulsive washing (see Cougle et al., 2007).

Safety gear. If completing the ESB session, participants were offered a pair of latex-free rubber gloves before they began the BAT.

Procedure

Participants were told they were participating in a study evaluating two versions of an existing treatment for contamination fear. Following the informed consent process, participants began their first exposure session, either with or without safety gear. The order in which the participants engaged in each condition was counterbalanced, so that an equal number of participants began with exposure with safety behaviour (ESB) as exposure and response prevention (ERP). The contaminants were also counterbalanced, so that an equal number of participants began with the dirty laundry as the dirt mixture and the bedpan as the toilet. Before beginning the first BAT, the experimenter presented the first object (moderately contaminated; either dirty laundry or a dirt mixture) and provided a description for it (see Materials). If this was an ESB session, participants were offered a pair of latex-free rubber gloves (right after they heard the object's description) to wear while approaching the contaminant. To avoid implying the absolute necessity of safety gear, the gloves were offered as follows: "Here is a pair of latex-free gloves that might be helpful to you while approaching the [name of contaminant]." Participants were then asked to provide their Anticipatory SUDS rating. Following the Anticipatory SUDS rating, the BAT was introduced as follows: "Now I will ask you to approach this contaminant in a stepwise fashion. The first step is..." (see Appendix C for detailed BAT). Participants then began the BAT and provided their Peak SUDS rating when they

reached the last step they could attain. Participants then provided the contamination rating as a manipulation check.

If this was an ESB session, participants were told to leave their gloves on for the next BAT. The same procedure then ensued with the extremely contaminated object (dirty toilet or dirty bedpan) once the participants were provided with the object's description and indicated their Anticipatory SUDS rating. Once the participants reached the last step in the BAT they could attain, they provided their Peak SUDS rating and the contamination rating. Following exposure to the second object, participants completed the EDS, TXA, CEQ, and STAXI-2.

Following completion of these measures, participants began the second exposure session, again with or without safety gear. The experimenter presented the first contaminant (moderately contaminated; whichever object was not used during the first exposure session) and provided a description for it. If this was an ESB session, the participant was offered a pair of latex-free rubber gloves to wear while approaching the contaminant. The participant then provided their Anticipatory SUDS rating and began approaching the contaminant. Once they reached the last step in the BAT they could attain, they provided their Peak SUDS rating and the contamination rating.

If this was an ESB session, participants were asked to leave their gloves on for the next BAT. The same procedure then ensued for the extremely contaminated object (whichever one was not used during the first exposure session) once the experimenter provided a description of the object and obtained the Anticipatory SUDS rating. Once the participants reached the last step in the BAT they could attain, they provided their Peak

SUDS and contamination ratings. Following exposure to the second object, participants again completed the EDS, TXA, CEQ, and STAXI-2.

Lastly, participants completed a questionnaire package which included the BAI, the contamination subscale of the VOCI, a demographics questionnaire, and a revised version of the OC-THQ. Following completion of the questionnaire battery, participants were fully debriefed.

Results

Data Screening

All data were collected on an online survey site that prevented participants from moving forward with additional survey items before completing all the previous items. For this reason, there were no missing data points or data entry errors.

Data screening procedures were carried out as recommended by Kline (2009). First, data were checked for out-of-range values (outliers). Individual scores were converted to Z-scores based on mean values, and these Z-scores were inspected for values exceeding +/- 3 (i.e., 3 standard deviations above or below the mean; Kline, 2009). This procedure revealed several outliers, so these values were re-entered as the next-lowest or next-highest score which did not exceed +/- 3 standard deviations. Next, indexes of skew and kurtosis were calculated for each of the dependent variables, which revealed one skewed variable. The number of BAT steps completed for the moderately contaminated object in ESB had a skew index of -5.00 and a kurtosis index of 23.54, indicating negative skew (i.e., most participants completed all 6 steps of this BAT). Given the relevancy of this result to the current study's hypotheses, it was decided not to apply a transformation method to this variable other than the replacement of outliers described above.

Inclusion/Exclusion Criteria

Only one participant met criteria for previous cognitive-behavioural therapy (CBT), as assessed by a revised version of the OC-THQ (Stobie et al., 2007; see Measures). This participant was excluded from the analyses that follow.

Manipulation Check

The toilet had the highest contamination rating ($M = 71.34$, $SD = 28.80$), followed by the bedpan ($M = 67.81$, $SD = 31.42$), the dirt mixture ($M = 52.74$, $SD = 30.67$), and the laundry ($M = 48.45$, $SD = 28.73$). The extremely contaminated objects were rated as significantly more contaminated than the moderately contaminated objects (all t's > 4.47, all p's < .001). Ten participants (13%) provided a contamination rating of *0* (i.e., *not at all contaminated*) for at least one contaminant. Of these *0* contamination ratings, five (33%) were for the dirt mixture, four (27%) were for the bedpan, three (20%) were for the laundry, and three (20%) were for the toilet. These 10 participants were excluded from the analyses that follow, leaving a final sample of 70 participants.

Treatment Acceptability

To assess the acceptability of each treatment condition (i.e., ESB and ERP), a one-way repeated-measures analysis of variance (ANOVA) was conducted. There was a significant difference in EDS scores, $F(1, 69) = 7.22$, $p = .009$, $\eta^2 = .10$, such that the ESB condition was rated as significantly more acceptable than the ERP condition (see Table 1 below).

Table 1

Means and Standard Deviations of Dependent Measures

	Condition	
	Exposure with safety behaviour (ESB)	Exposure and response prevention (ERP)
Acceptability*	57.27 (17.65)	51.30 (19.78)
Subjective fear (Moderately)		
Anticipatory SUDS*	19.03 (22.59)	28.84 (27.40)
Peak SUDS**	19.51 (25.02)	36.87 (30.69)
Subjective fear (Extremely)		
Anticipatory SUDS**	34.76 (29.40)	45.79 (31.25)
Peak SUDS**	42.59 (31.47)	55.66 (30.13)
Behavioural approach		
Moderately*	5.91 (.41)	5.39 (1.34)
Extremely**	5.43 (1.34)	4.46 (1.93)

Note. $N = 70$. Moderately = Moderately contaminated object. Extremely = Extremely contaminated object. SUDS = Subjective Units of Distress Scale. Adjacent means are significantly different from each other.

*$p < .01$. **$p < .001$.

Subjective Fear

To assess subjective fear in each treatment condition (i.e., ESB and ERP), two 2 (condition) x 2 (stimulus type) x 4 (time) repeated-measures ANOVAs were conducted, the first for Anticipatory SUDS ratings and the second for Peak SUDS ratings. There was

a significant difference in Anticipatory SUDS ratings by condition, $F(1, 69) = 20.05$, $p <$ .001, partial $\eta^2 = .23$, and by stimulus type, $F(1, 69) = 43.15$, $p < .001$, partial $\eta^2 = .39$, such that Anticipatory SUDS ratings were significantly lower in the ESB condition compared to the ERP condition for both the moderately and extremely contaminated objects (see Table 1 above). There was no interaction, $F(1, 69) = .12$, $p = .73$.

There was a significant difference in Peak SUDS ratings by condition, $F(1, 69) =$ 38.30, $p < .001$, partial $\eta^2 = .36$, and by stimulus type, $F(1, 69) = 80.51$, $p < .001$, partial $\eta^2 = .54$, such that Peak SUDS ratings were significantly lower in the ESB condition compared to the ERP condition for both the moderately and extremely contaminated objects (see Table 1 above). There was no interaction, $F(1, 69) = .83$, $p = .37$.

Behavioural Approach

To assess behavioural approach in each treatment condition (i.e., ESB and ERP), a 2 (condition) by 2 (stimulus type) by 4 (time) repeated-measures ANOVA was conducted. There was a significant difference in behavioural approach by condition, $F(1, 69) = 28.49$, $p < .001$, partial $\eta^2 = .29$, and by stimulus type, $F(1, 69) = 27.84$, $p < .001$, partial $\eta^2 = .29$, such that the number of BAT steps completed was significantly higher in the ESB condition compared to the ERP condition for both the moderately and extremely contaminated objects (see Table 1 above). There was also an interaction between condition and stimulus type, $F(1, 69) = 4.90$, $p = .03$, partial $\eta^2 = .07$, such that the effect of condition was greater for the extremely contaminated objects than for the moderately contaminated objects (see Figure 1 below).
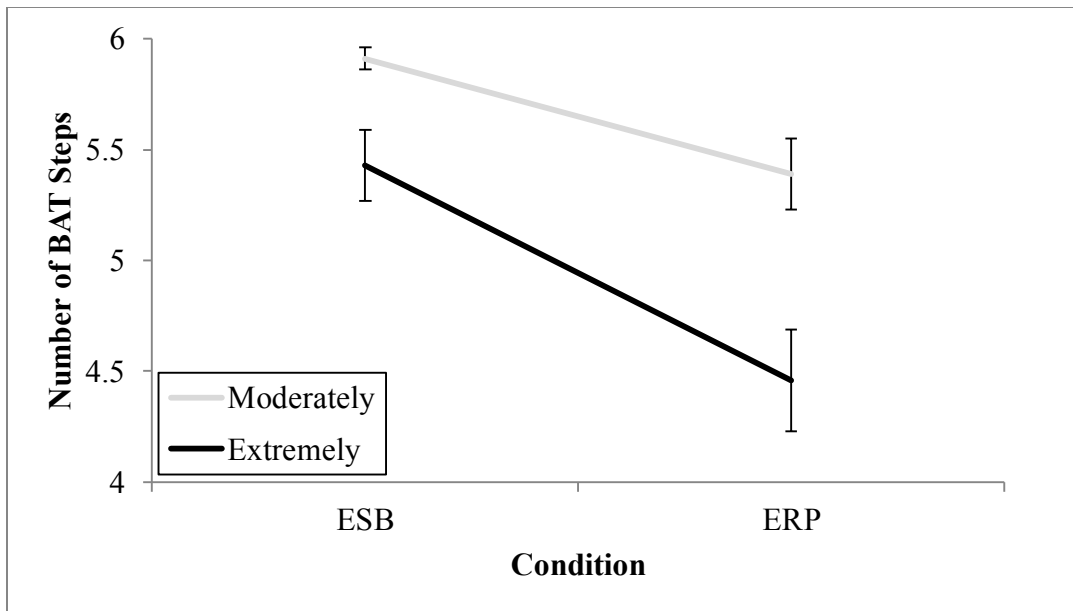
Figure 1. Mean number of BAT steps completed. $N = 70$. BAT = Behavioural approach test. ESB = Exposure with safety behaviour. ERP = Exposure and response prevention. Moderately = Moderately contaminated object. Extremely = Extremely contaminated object. Error bars represent standard errors.

Contamination Scores and Treatment Acceptability

Scores on the contamination subscale of the VOCI ranged from 3 to 41 ($M = 14.19$, $SD = 8.67$). To assess the predictive utility of contamination scores on treatment acceptability, a simple linear regression was conducted. Scores on the contamination subscale of the VOCI were entered as the independent variable and the difference in EDS scores between ESB and ERP was entered as the dependent variable. Contamination scores did not predict the difference in acceptability ratings between ESB and ERP ($\beta = -.18$, $p = .129$, $R^2 = .03$).

Validation of the Treatment Acceptability Scale (TXA)

Two participants (3%) were excluded from the analyses that follow as they did not complete the CEQ, leaving a final sample of 68 participants for the validation study.

To assess internal consistency of the TXA, Cronbach's alpha was calculated for both administrations of the TXA (i.e., after ESB and after ERP) which revealed excellent internal consistency ($\alpha = .88$ for ESB and $\alpha = .86$ for ERP).

To assess convergent validity of the TXA, Pearson correlations were employed. There was a significant positive correlation between the TXA and the EDS and between the TXA and the CEQ for both administrations of these measures (i.e., after ESB and after ERP; see Table 2 below).

To assess divergent validity of the TXA, Pearson correlations were employed. There was a significant negative correlation between the TXA and the STAXI-2 (see Table 2 below) for both administrations of these measures (i.e., after ESB and after ERP).

Table 2

Correlations between Treatment Acceptability, Endorsement and Discomfort,

Credibility/Expectancy, and State Anger

	Condition							
	ESB				ERP			
	TXA	EDS	CEQ	STAXI	TXA	EDS	CEQ	STAXI
TXA	--	.78***	.66***	-.61***	--	.76***	.52***	-.43***
EDS		--	.78***	-.57***		--	.64***	-.28*
CEQ			--	-.44***			--	-.32**

Note. $N = 68$. TXA = Treatment Acceptability Scale. EDS = Endorsement and

Discomfort Scale. CEQ = Credibility/Expectancy Questionnaire. STAXI = State Anger

Expression Inventory-2.

*p < .05. **p < .01. ***p < .001.

To compare the magnitude of the correlations between the TXA and EDS

(convergent measures) and the TXA and STAXI-2 (divergent measures) for both

administrations of these measures, two *t*-tests for dependent correlations were employed,

the first for the administration following ESB and the second for the administration

following ERP. These analyses revealed significant differences in the correlations, such

that the correlations between the TXA and EDS were higher in magnitude than the

correlations between the TXA and STAXI-2 ($t = 10.81, p < .01$ for ESB and $t = 9.81, p <$

.01 for ERP).

Finally, partial Pearson correlations were conducted between the TXA and EDS, controlling for scores on the BAI. These analyses revealed that the associations between the TXA and EDS were not due to general symptoms of anxiety for either administration of these measures ($r = .77$, $p < .001$ for ESB and $r = .78$, $p < .001$ for ERP).

Discussion

It has been proposed that safety behaviour may enhance the acceptability of exposure therapy (Rachman et al., 2008), an evidence-based treatment for anxiety disorders that is prone to dropouts and refusals. The current study tested this proposal by comparing the acceptability of exposure with safety behaviour (ESB) and exposure and response prevention (ERP) for contamination fear. Overall, the results of this study indicate that ESB is more acceptable than ERP. These findings support the notion that safety behaviour may be used to increase the acceptability of exposure-based treatments.

Safety Behaviour and Treatment Acceptability

It was predicted that ESB would be rated as more acceptable than ERP. This hypothesis was supported, as the acceptability rating of the ESB condition was significantly higher than that of the ERP condition. Additionally, condition (i.e., ESB or ERP) explained 10% of the total variance in acceptability scores, lending further support for this hypothesis.

In addition to self-reported acceptability, we hypothesized that subjective fear ratings would be lower in ESB compared to ERP. This hypothesis was supported, as both Anticipatory and Peak SUDS ratings were significantly lower in the ESB condition compared to the ERP condition for both the moderately and extremely contaminated objects. Additionally, condition (i.e., ESB or ERP) explained 23% of the residual

variance in Anticipatory SUDS ratings and 36% of the residual variance in Peak SUDS ratings, further supporting this hypothesis.

We also predicted that behavioural approach to the contaminants would be greater in ESB compared to ERP as measured by a series of behavioural approach tests (BATs). This hypothesis was supported, as participants completed significantly more steps in the BATs during the ESB condition than during the ERP condition. Condition (i.e., ESB or ERP) explained 29% of the residual variance in behavioural approach. Interestingly, there was an interaction between condition and stimulus type (i.e., moderately or extremely contaminated object), such that the effect of condition was greater for the extremely contaminated objects. This is a noteworthy finding, as it suggests that safety behaviour may be particularly helpful during exposure to highly distressing situations or objects. Given that dropouts typically occur in the beginning stages of treatment when exposure may seem especially threatening or unacceptable (Rachman, 2004), perhaps safety behaviour should be implemented for the most difficult exposure sessions to prevent withdrawal from treatment.

Taken together, these findings support the notion that safety behaviour enhances the acceptability of exposure therapy. Given that a substantial proportion of clients drop out of CBT (Hofmann et al., 1998), in particular ERP for OCD (Foa et al., 2005), modification of the treatment is critically needed. As demonstrated by the current study's results, exposure with safety behaviour may be a promising approach to increasing treatment acceptability. In addition to self-reported acceptability, participants in this study reported lower levels of anxiety and were able to approach the contaminants more closely in the safety behaviour condition. Given that close interaction with the feared

stimulus is sometimes necessary for disconfirmation of threat-relevant beliefs to occur, it is encouraging that safety behaviour may actually facilitate behavioural approach during exposure. These results are consistent with previous research documenting closer approach to feared stimuli during exposure sessions with safety gear (Milosevic & Radomsky, 2008, 2012), as well as recent evidence demonstrating substantial reductions in fear and avoidance following exposure with safety behaviour (Rachman et al., 2011; van den Hout et al., 2011). Although treatment outcome was not a primary focus of the current study, overall it appears that safety behaviour may not necessarily interfere with CBT. Therefore, the unqualified rejection of safety behaviour during exposure therapy may be unnecessary at this time (Rachman et al., 2008).

More specifically, the *judicious* use of safety behaviour in exposure therapy may be beneficial. Judicious use has been defined as "the careful use of safety behaviour, with an emphasis on the early stages of treatment" (Rachman et al., 2008, p. 169). In practice, this might consist of introducing safety behaviour in the first few exposure sessions until the client feels comfortable to eliminate it, or implementing safety aids for especially difficult exposures. As mentioned previously, the results of this study indicate that safety gear may be particularly helpful during exposure to highly distressing situations or objects. Additionally, clients could be trained to *seek* safety rather than distance themselves from it, providing enhanced sense of control and mastery over exposure sessions (Rachman et al., 2008). While the results of this study suggest that safety behaviour enhances the acceptability of single-session exposure therapy, the impact of a gradual removal of safety behaviour was not specifically tested and cannot be addressed here.

The mechanism underlying the effect of safety behaviour in exposure therapy is unclear. Some suggest that reliance on safety behaviour maintains anxiety and avoidance (Salkovskis, 1991), while others argue that safety behaviour may be beneficial by increasing self-efficacy and control during exposure, thus facilitating adaptive coping strategies (Parrish et al., 2008; Rachman et al., 2008). Consistent with the latter theory, recent studies have shown that participants who used safety gear during exposure reported increased self-efficacy and confidence to cope with threatening situations (Hood et al., 2010; Milosevic & Radomsky, 2012). In the current study, precautions were taken not to imply that safety gear was *necessary* to complete the exposure sessions (i.e., "reliance" on safety behaviour), but rather *might be helpful* to participants. If safety behaviour is offered in such a way, participants may feel some control over the exposure sessions, thus promoting self-efficacy and self-confidence. Several participants in this study made comments that suggested they felt more comfortable and more in-control while completing the ESB condition (e.g., "I would not do this without gloves" or "With gloves on? I'm fine"). These comments were generally absent or reversed in the ERP condition (e.g., "I feel like my hands are all dirty" or "I want to throw up"). Based on these results and recent empirical investigations, it could be that enhanced self-efficacy may be a key mechanism underlying the impact of safety behaviour in exposure therapy. Of course, this is an empirical question.

Contamination Fear and Treatment Acceptability

Although the main focus of this study was to compare the acceptability of ESB and ERP, we were also interested in the association between contamination fear and treatment preference. It was hypothesized that contamination fear would predict the

difference in acceptability ratings between ESB and ERP. This hypothesis was not supported. In fact, scores on the VOCI contamination subscale were virtually unrelated to the difference in acceptability ratings between the two treatment conditions. This was an unexpected result for several reasons. First, Rachman et al. (2008) have proposed the judicious use of safety behaviour for severely distressed or fearful clients that may find exposure particularly unacceptable. Second, Rachman and colleagues (2011) recently introduced safety behaviour for severe cases of contamination-related OCD that were unresponsive to or unwilling to receive ERP. Given the nature of the current sample (i.e., undergraduate students rather than individuals with clinically-significant contamination fear), it is likely that a restricted range in contamination scores affected these results. Alternatively, it could be that severity of contamination fear is indeed unrelated to treatment acceptability, in which case the use of safety behaviour may be beneficial regardless of symptom profile. Previous research investigating the association between OCD symptom severity and dropout from CBT has yielded mixed findings, with some authors reporting no association (Rector, Cassin, & Richter, 2009) and others finding higher symptom levels only among early drop-outs (i.e., before session 6; Aderka et al., 2011). Future research is needed to clarify the relationship between symptoms of anxiety and treatment preference, particularly among clinical populations.

Treatment Acceptability Scale (TXA)

The last objective of this study was to validate a new measure of treatment acceptability and adherence called the Treatment Acceptability Scale (TXA). It was hypothesized that the TXA would show acceptable to excellent psychometric properties. This hypothesis was supported. Internal consistency was excellent for both

administrations of the TXA (i.e., after ESB and after ERP). The TXA also demonstrated convergent validity, as it was highly correlated with the EDS and CEQ, two related measures of treatment acceptability and credibility, respectively. Somewhat unexpectedly, the TXA was moderately negatively correlated with the STAXI-2 for both administrations of these measures, but the magnitude of these correlations was significantly lower than the correlations between the TXA and EDS. This provides evidence for divergent validity of the TXA. Furthermore, the relationship between the TXA and EDS could not be explained by general symptoms of anxiety, as this relationship remained significant after controlling for scores on the BAI. Given the paucity of self-report questionnaires available to assess treatment acceptability and adherence, these are encouraging preliminary findings for the reliability and validity of the TXA.

Limitations and Future Directions

This study aimed to investigate the acceptability of exposure with safety behaviour (ESB), a novel alternate approach to traditional exposure and response prevention (ERP) for OCD. While the results are promising, the current study is not without its limitations. First, this study used a non-clinical sample of undergraduate students, limiting the generalizeability of the results to treatment-seeking clinical populations with contamination-related OCD or other anxiety problems. As suggested previously, future research should aim to replicate and extend these findings with clinically-anxious participants. Second, treatment acceptability was measured only once for each treatment session, which included two contaminants. This may call into question the validity of the acceptability ratings, as it is possible that participants were unable to

recall or did not consider the details of each behavioural approach when completing the EDS. We attempted to counteract this limitation by counterbalancing the contaminants, but we cannot verify whether participants equally considered all four BATs when providing their acceptability ratings. Future studies should measure acceptability following each behavioural approach to ensure adequate consideration of each one.

An additional limitation is the absence of a no-exposure control condition in this study. Although the aim of the current study was to compare the acceptability of ESB and ERP, a control condition would have been useful to verify that the main effect of condition was not due to a ceiling effect (both conditions were highly acceptable). A control condition would have allowed an additional basis of comparison, thus counteracting the potential ceiling effect. Future research should aim to replicate these findings using a no-exposure control condition.

Finally, the use of covert safety behaviour (e.g., mentally reciting a comforting mantra) was not systematically controlled in this study. Therefore, it is possible that participants relied on covert safety aids to complete the exposures, potentially increasing the acceptability of the treatments. However, it is presumable that the use of a completely within-participants repeated-measures design controlled for the use of covert safety behaviour during the treatment sessions. A related limitation is the use of one safety aid in the ESB condition (i.e., latex-free gloves) rather than allowing participants to choose their own safety gear, as previous investigations have done (Milosevic & Radomsky, 2008). Given that safety behaviour is highly idiosyncratic (Salkovskis et al., 1996), it is possible that some participants did not find the gloves particularly helpful during exposure. To overcome these limitations, future research should measure covert safety

behaviour and/or encourage participants not to use it during the treatment sessions. Additionally, offering participants a selection of safety gear from which to choose would maximize the perceived helpfulness of safety behaviour.

There are several possible future directions for this research. It will be helpful to elucidate the mechanisms underlying the impact of safety behaviour in exposure therapy. To date, these mechanisms are largely unexplored. To this end, increased self-efficacy may be an important potential mechanism to investigate in future research. It will also be necessary to evaluate whether the *judicious* use of safety behaviour indeed enhances treatment acceptability, particularly among clinical populations of individuals with anxiety disorders. The use of a clinical sample in future studies will also allow elucidation of the association between severity of anxiety symptoms and treatment preference. Given the unacceptably high rate of dropout from CBT for anxiety disorders, it is important to clarify potential risk factors for attrition. Finally, it will be useful to conduct additional psychometric studies of the TXA to support its reliability and validity, particularly in clinical samples.

Summary

The current study demonstrated that exposure with safety behaviour (ESB) is more acceptable than exposure and response prevention (ERP) for contamination fear. These results support the notion that safety behaviour may enhance the acceptability of exposure therapy for anxiety disorders, a difficult and demanding treatment that is prone to dropouts and refusals. Although the current study did not focus specifically on treatment efficacy, previous research has demonstrated that safety behaviour does not necessarily interfere with the benefits of exposure therapy. Coupled with the current study's results, safety behaviour may be a promising approach to increasing the acceptability of exposure-based treatments. Further replication and extension of these results is necessary to elucidate the mechanism underlying the impact of safety behaviour in exposure therapy, particularly among clinical populations. However, the current study provides a foundation for the acceptability-enhancing role of safety behaviour in exposure therapy.

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Appendix A

Questionnaires:

Beck Anxiety Inventory

Credibility/Expectancy Questionnaire

Endorsement and Discomfort Scale

Revised version of the OCD Treatment History Questionnaire

State-Trait Anger Expression Inventory-2 – State Anger Subscale

Treatment Acceptability Scale

Vancouver Obsessional Compulsive Inventory – Contamination Subscale

BAI

Below is a list of common symptoms of anxiety. Please read each item in the list carefully. Indicate how much you have been bothered by each symptom during the PAST WEEK, INCLUDING TODAY by placing an X in the corresponding space in the column next to each symptom.

		Not at all	Mildly. It did not bother me much	Moderately. It was very unpleasant but I could stand it	Severely I could barely stand it
1	Numbness or tingling				
2	Feeling hot				
3	Wobbliness in legs				
4	Unable to relax				
5	Fear of worst happening				
6	Dizzy or lightheaded				
7	Heart pounding or racing				
8	Unsteady				
9	Terrified				
10	Nervous				
11	Feelings of choking				
12	Hands trembling				
13	Shaky				
14	Fear of losing control				
15	Difficulty breathing				
16	Fear of dying				
17	Scared				
18	Indigestion or discomfort in abdomen				
19	Faint				
20	Face flushed				
21	Sweating (not due to heat)				

CEQ

Please take a moment to consider the treatment you have just completed. Please respond to the questions below based on their respective scales.

1. How logical does the treatment offered to you seem?

   Not at all logical   Somewhat logical   Very logical
        1   2   3   4   5   6   7   8   9

2. How successful do you think this treatment will be in reducing your symptoms?

   Not at all useful   Somewhat useful   Very useful
        1   2   3   4   5   6   7   8   9

3. How confident would you be in recommending this treatment to a friend who experiences similar problems?

   Not at all confident   Somewhat confident   Very confident
        1   2   3   4   5   6   7   8   9

4. How much improvement in your symptoms do you think will occur?

   0%   10%   20%   30%   40%   50%   60%   70%   80%   90%   100%

5. How much do you really *feel* that treatment will help you to reduce your symptoms?

   Not at all   Somewhat   Very much
        1   2   3   4   5   6   7   8   9

6. How much improvement in your symptoms do you really *feel* will occur?

   0%   10%   20%   30%   40%   50%   60%   70%   80%   90%   100%

EDS

Thinking about the treatment you have just completed, please evaluate your response to the treatment descriptions below. Select the number that best describes your agreement/disagreement with each statement.

1. I would *accept* this treatment for reducing my fear/anxiety.

1	2	3	4	5	6	7	8	9
Disagree strongly								Agree strongly

2. This treatment is *suitable* for reducing my fear/anxiety.

1	2	3	4	5	6	7	8	9
Disagree strongly								Agree strongly

3. If I were to receive this treatment, it would be *tolerable* to me.

1	2	3	4	5	6	7	8	9
Disagree strongly								Agree strongly

4. I expect *positive benefits* if I participate in this treatment.

1	2	3	4	5	6	7	8	9
Disagree strongly								Agree strongly

5. This treatment is a *credible* option for my type of problem.

1	2	3	4	5	6	7	8	9
Disagree strongly								Agree strongly

6. This treatment should prove *effective* in reducing my fear/anxiety.

1	2	3	4	5	6	7	8	9
Disagree strongly								Agree strongly

7. This treatment is *appropriate* for reducing my fear/anxiety.

1	2	3	4	5	6	7	8	9
Disagree strongly								Agree strongly

8. The requirements of this treatment are *reasonable*.

1	2	3	4	5	6	7	8	9
Disagree strongly								Agree strongly

9. This treatment is *justifiable* for application with individuals who are suffering from fear/anxiety.

1	2	3	4	5	6	7	8	9
Disagree strongly								Agree strongly

10. Participating in this treatment would cause me *discomfort*.

1	2	3	4	5	6	7	8	9
Disagree strongly								Agree strongly

Revised version of the *OCD Treatment History Questionnaire*

1. Have you ever had psychotherapy?
    YES   NO

If you answered NO, please skip the remainder of this section.

If you answered YES, when were you in psychotherapy? Please list all.

_____
_____
_____

2. Who did you see? If you've been in psychotherapy more than once, please respond about your MOST RECENT therapy experience.

      Counsellor _____

      Psychologist _____

      Psychiatrist _____

      Nurse therapist _____

      Psychodynamic psychotherapist _____

      Nurse _____

      Family Therapist _____

      Other (please specify) _____

      Not sure _____

3. Was this person a Cognitive Behaviour Therapist?
    YES   NO   UNSURE

4. How many sessions did you see them (approximately)?
_____ sessions

5. How long in minutes did each session last?
_____ minutes

6. Over approximately how many months did the sessions take place?
_____ months

7. What type of therapy was done? Check one.

Supportive Therapy _____

Behaviour Therapy _____

Cognitive Behaviour Therapy _____

Psychodynamic Therapy _____

Group Therapy _____

Family / couples therapy _____

Other (please state) _____

Not sure _____

8. Did you do or your therapist do any of the following in therapy? Please circle yes/no.

Spent most of the sessions talking about my childhood / past experiences   YES   NO

Deliberately expose yourself to frightening thoughts or things in the therapist's office
     YES   NO

Go into situations outside the therapy room where you had to face whatever you were
afraid of on your own   YES   NO

My therapist seemed to imply that the origins of my problem lie in my childhood, and the
past should be explored in order to understand the present better   YES   NO

Looking at links between beliefs, thoughts and feelings   YES   NO

Go into situations outside the therapy room where you had to face whatever you were
afraid of with your therapist present   YES   NO

Concentrated on beliefs about thoughts most sessions   YES   NO

The therapist was silent for most of the sessions and allowed me to talk freely about
whatever was on my mind at the time   YES   NO

Be given or do set reading on the problem   YES   NO

Keep records of your thoughts   YES   NO

The therapy emphasized changing behaviour rather than working directly on thoughts
    YES   NO

Changing the meaning attached to thoughts   YES   NO

Give you homework to do between sessions   YES   NO

STAXI-2

A number of statements that people use to describe themselves are given below. Read each statement and then circle the appropriate number on the rating sheet to indicate how you feel *right now*. There are no right or wrong answers. Do not spend too much time on any one statement. Mark the answer that best describes your *present feelings*.

Fill in 1 for *Not at all*
Fill in 2 for *Somewhat*
Fill in 3 for *Moderately so*
Fill in 4 for *Very much so*

How I Feel Right Now

1.	I am furious	1 2 3 4
2.	I feel irritated	1 2 3 4
3.	I feel angry	1 2 3 4
4.	I feel like yelling at somebody	1 2 3 4
5.	I feel like breaking things	1 2 3 4
6.	I am mad	1 2 3 4
7.	I feel like banging on the table	1 2 3 4
8.	I feel like hitting someone	1 2 3 4
9.	I feel like swearing	1 2 3 4
10.	I feel annoyed	1 2 3 4
11.	I feel like kicking somebody	1 2 3 4
12.	I feel like cursing out loud	1 2 3 4
13.	I feel like screaming	1 2 3 4
14.	I feel like pounding somebody	1 2 3 4
15.	I feel like shouting out loud	1 2 3 4

TXA

Please respond to the treatment that you just completed by indicating your agreement with each of the below statements.

1. If I began this treatment, I would be able to complete it.

1	2	3	4	5	6	7
Disagree strongly			Neither agree nor disagree			Agree strongly

2. If I participated in this treatment, I would be able to adhere to its requirements.

1	2	3	4	5	6	7
Disagree strongly			Neither agree nor disagree			Agree strongly

3. I would find this treatment exhausting.

1	2	3	4	5	6	7
Disagree strongly			Neither agree nor disagree			Agree strongly

4. It would be distressing to me to participate in this treatment.

1	2	3	4	5	6	7
Disagree strongly			Neither agree nor disagree			Agree strongly

5. Overall, I would find this treatment intrusive.

1	2	3	4	5	6	7
Disagree strongly			Neither agree nor disagree			Agree strongly

6. This treatment would provide effective ways to help me cope with my fear/anxiety.

1	2	3	4	5	6	7
Disagree strongly			Neither agree nor disagree			Agree strongly

7. I would prefer to try another type of psychological treatment instead of this one.

1	2	3	4	5	6	7
Disagree strongly			Neither agree nor disagree			Agree strongly

8. I would prefer to receive medication for my fear/anxiety instead of this treatment.

1	2	3	4	5	6	7
Disagree strongly			Neither agree nor disagree			Agree strongly

9. I would recommend this treatment to a friend with a similar problem (i.e. fear/anxiety).

1	2	3	4	5	6	7
Disagree strongly			Neither agree nor disagree			Agree strongly

10. If I began this treatment, I would likely drop out.

1	2	3	4	5	6	7
Disagree strongly			Neither agree nor disagree			Agree strongly

VOCI-C

Please rate each statement by putting a circle around the number that best describes how much the statement is true of you. Please answer every item, without spending too much time on any particular item.

How much is each of the following statements true of you?

> 0 = Not at all
> 1 = A little
> 2 = Some
> 3 = Much
> 4 = Very much

1. I feel very dirty after touching money

2. I use an excessive amount of disinfectants to keep my home or myself safe from germs

3. I spend far too much time washing my hands

4. Touching the bottom of my shoes makes me very anxious

5. I find it very difficult to touch garbage or garbage bins

6. I am excessively concerned about germs and disease

7. I avoid using public telephones because of possible contamination

8. I feel very contaminated if I touch an animal

9. I am very afraid of having even slight contact with bodily secretions (blood, urine, sweat, etc.)

10. One of my major problems is that I am excessively concerned about cleanliness

11. I often experience upsetting and unwanted thoughts about illness

12. I am afraid to use even well kept public toilets because I am so concerned about germs

Appendix B

Experimenter record form for exposure sessions

Session 1: ESB   ERP

Moderately contaminated object:

How likely to touch _____

Anticipatory SUDS _____

BAT steps completed _____

Peak SUDS _____

Behavioural Observations
_____

_____

Contamination rating _____

Disgust rating _____

Asked to wash hands _____

Extremely contaminated object:

How likely to touch _____

Anticipatory SUDS _____

BAT steps completed _____

Peak SUDS _____

Behavioural Observations:
_____

_____

Contamination rating _____

Disgust rating _____

Asked to wash hands _____

Used sanitizer _____

Session 2: ESB   ERP

Moderately contaminated object:

How likely to touch _____

Anticipatory SUDS _____

BAT steps completed _____

Peak SUDS _____

Behavioural Observations
_____

_____

Contamination rating _____

Disgust rating _____

Asked to wash hands _____

Extremely contaminated object:

How likely to touch _____

Anticipatory SUDS _____

BAT steps completed _____

Peak SUDS _____

Behavioural Observations
_____

_____

Contamination rating _____

Disgust rating _____

Asked to wash hands _____

Used sanitizer _____

Appendix C

Complete behavioural approach test (BAT)

Behavioural Approach Test (BAT)

Step 1	Approach contaminant and smell from within 3 ft.
Step 2	Touch contaminant with a sheet of tissue
Step 3	Touch contaminant with right index finger
Step 4	Touch contaminant with right hand
Step 5	Touch contaminant with both hands
Step 6	Touch contaminant with both hands, then rub hands together

Reproduced from Cougle, Wolitzky-Taylor, Lee, & Telch, 2007.

Appendix D

Informed Consent Forms:

First Consent Form

Second Consent Form

CONSENT FORM TO PARTICIPATE IN RESEARCH

This is to state that I agree to participate in a program of research being conducted by Hannah Levy (ha_levy@live.concordia.ca; 514-848-2424 ext 5965) under the supervision of Dr. Adam Radomsky (adam.radomsky@concordia.ca; 514-848-2424 ext 2202) in the Psychology Department of Concordia University.

A. PURPOSE
I have been informed that the purpose of this study is to evaluate different components of treatment for contamination fear. Contamination fear is intense fear of objects that are perceived as dirty, disgusting, or illness-causing. Individuals with contamination fear experience severe anxiety and distress when confronted with these objects.

B. PROCEDURES
If I agree to participate in this study, I will be asked to approach a variety of contaminants, as close as I am able, and then provide my anxiety rating. After approaching these contaminants, I will complete three questionnaires that evaluate the treatment sessions I have just completed. I will then be asked to complete a questionnaire package. The package should take approximately 40 minutes to complete. These questionnaires ask no questions regarding my name and they will not be connected in any way with my contact details. Finally, I will be fully debriefed about the purpose of the study as well as the hypotheses. For my participation, I will receive the opportunity to submit my name in a draw for cash prizes, OR course credit if I am part of the undergraduate participant pool at Concordia University. I am aware that this study employs a standardized protocol for which anxious and depressive symptoms are assessed. I will be provided access to a treatment resource manual containing information about self-help books and local treatment services.

C. CONDITIONS OF PARTICIPATION
I understand that the study will take approximately 60 minutes to complete. I understand that I am free to withdraw my consent and discontinue my participation in this study at any time, without any negative consequences whatsoever. I understand that all information obtained will be kept strictly confidential and will be stored under lock and key for a period of seven years after which it will be shredded. Access to this information will be made available only to restricted members of Dr. Radomsky's research team. I understand that to ensure my confidentiality all data will be coded by number only and will be kept separate from my name. I understand that data from this study may be published, but that no identifying information will be released.

If you have any questions concerning the study, please feel free to ask the experimenter now. If other questions or concerns come up following the study, please feel free to contact our lab at (514) 848-2424, ext. 5965.

Adam S. Radomsky, Ph.D., Associate Professor
Hannah Levy, B.A., Master's Student

I HAVE CAREFULLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY.

NAME (please print) _____

SIGNATURE _____

DATE _____

WITNESS SIGNATURE _____

Please contact the Research Ethics and Compliance Advisor of Concordia University, at 514.848.2424.x 7481 or ethics@alcor.concordia.ca

CONSENT FORM TO PARTICIPATE IN RESEARCH

As you have just been informed, the use of deceptive information was essential in this study in order to simulate a real treatment session for contamination fear. During these real treatment sessions, individuals are exposed to the contaminants that they fear.

By signing below you indicate that you have been informed of this minor deception and allow us to include your results in our analyses. Given the nature of this deception, we ask that you refrain from talking about the specific details of this study with your friends and/or classmates.

Signature _____

Witness _____

Date _____

If you have any questions concerning this study, please feel free to ask the researcher or call the lab at 848-2424, ext. 5965.

Adam Radomsky, Ph.D., Associate Professor
Hannah Levy, B.A., Graduate Student

Appendix E

Scripts:

Initial information and consent

Treatment sessions

Final questionnaire battery

Debriefing

Initial Information and consent

Thank you for coming in to participate in this study. My name is Hannah and I am a Master's student here in the lab. Before we begin the consenting process, I will ask you to please turn off your cell phone. Thank you.

This study aims to evaluate two versions of an existing treatment for contamination fear, which is fear of objects that are perceived as dirty, disgusting, illness-causing, et cetera. You will be asked to approach two contaminants in each version of the treatment, as close as you are able, and then provide an anxiety rating. After approaching the two contaminants in each version of the treatment, you will be asked to complete several questionnaires that evaluate the version of treatment you have just completed. At the conclusion of the study, you will be fully debriefed about the purposes of the study as well as the hypotheses. The study will take approximately 45 minutes, and you will be offered one participant pool credit for your participation. If you are not in a pool class, we will offer you entry into a draw for one of four cash prizes.

Please note that the information you will provide will be kept strictly confidential. Any identifying information will be kept under lock and key for seven years, at which time it will be shredded. We will separate any identifying information from your data so it cannot be linked back to you.

As a voluntary participant, you are free to withdraw your participation in this study at any time without negative consequence.

Before we begin, I'm going to ask that you read through and sign this consent form indicating that you are willing to participate and understand what your participation entails. Please sign and date at the bottom of the consent form if you agree to the conditions.

Any other questions before we begin?

Treatment sessions and questionnaires

Now we will begin with the [first/second] version of treatment, which includes two contaminants. Please wait here while I get the materials.

FOR LAUNDRY: This is a box of dirty laundry. It includes socks, underwear, old t-shirts, and rags. Some of these items may have been touched with bodily fluids.

FOR DIRT: This is a mixture of dirt, dead insects, and animal hair.

IF ESB SESSION: Here is a pair of latex-free gloves that might be helpful to you while you're approaching the [dirt, laundry]. Please put them on.

Now tell me, how likely are you to touch this contaminant on a scale from 0-100, 0 being not at all likely and 100 being extremely likely, I will most certainly touch it?

ANTICIPATORY SUDS: Please indicate on a scale from 0 to 100, 0 being neutral and 100 being the worst distress you can imagine, how anxious you feel right now.

Now I will ask you to approach this contaminant in a stepwise fashion. The first step is to start here [indicate tape on floor, furthest from the table] and walk as close to the [dirt, laundry] as you are able.

Great. The next step is to take a tissue and touch the [dirt, laundry] with it.

Good. The next step is to touch the [dirt, laundry] with your right index finger.

Good. The next step is to touch the [dirt, laundry] with your right hand.

Great. The next step is to touch the [dirt, laundry] with both hands.

Good. The last step is to touch the [dirt, laundry] with both hands, then rub your hands together.

PEAK SUDS RATING: Please indicate on a scale from 0 to 100, 0 being neutral and 100 being the worst distress you can imagine, how anxious you feel right now.

MANIPULATION CHECK: On a scale from 0-100, 0 being not at all contaminated and 100 being the most you can imagine, how contaminated is the object you just touched?

Thank you.

Now you will begin approaching the second contaminant. Please wait here while I get the materials. [If ESB session] You can leave your gloves on.

FOR BEDPAN: This is a dirty bedpan.

FOR TOILET: This is a dirty toilet.

Now tell me, how likely are you to touch [the inside of the toilet bowl, the inside rim of the bedpan] on a scale from 0-100, 0 being not at all likely and 100 being extremely likely, I will most certainly touch it?

ANTICIPATORY SUDS: Please indicate on a scale from 0 to 100, 0 being neutral and 100 being the worst distress you can imagine, how anxious you feel right now.

Now I will ask you to approach this contaminant in a stepwise fashion. The first step is to start here [indicate tape on floor, furthest from the table or toilet] and walk as close to the [toilet, bedpan] as you are able.

Great. The next step is to take a tissue and touch the [inside of the toilet bowl, inside rim of the bedpan] with it.

Good. The next step is to touch the [inside of the toilet bowl, inside rim of the bedpan] with your right index finger.

Good. The next step is to touch the [inside of the toilet bowl, inside rim of the bedpan] with your right hand.

Great. The next step is to touch the [inside of the toilet bowl, inside rim of the bedpan] with both hands.

Good. The last step is to touch the [inside of the toilet bowl, inside rim of the bedpan] with both hands, then rub your hands together.

PEAK SUDS RATING: Please indicate on a scale from 0 to 100, 0 being neutral and 100 being the worst distress you can imagine, how anxious you feel right now.

MANIPULATION CHECK: On a scale from 0-100, 0 being not at all contaminated and 100 being the most you can imagine, how contaminated is the object you just touched?

Thank you. Now, I'll ask you to complete four questionnaires on this computer that evaluate the version of treatment you've just completed, which includes both of the contaminants. By treatment I mean what we've just done, approaching the contaminants in a stepwise fashion [if ESB session: with gloves on]. Remember there are no right or wrong answers. Please don't worry too much about any one item. Usually your first instinct is the best answer. When you've finished the four questionnaires, the screen will say "Please stop here and wait for the experimenter." If I'm not back by that point, you can just sit quietly and wait.

Final Questionnaire Battery

Now I'll ask you to complete some more questionnaires on this computer. Remember there are no right or wrong answers. Please don't worry too much about any one item. Usually your first instinct is the best answer. I'm going to leave you alone to complete these. Please ring the bell to let me know when you have finished.

Debriefing

Okay, that concludes the experiment. We just have a few things to go through before you leave. First, let's discuss this consent form. As the form indicates, this study did not use real contaminants. The clothing you approached was not actually touched by bodily fluids. The toilet you approached was bought new and smeared with wet potting soil. The bedpan you approached was filled with dilute apple juice.

We needed to use some deception in this study in order to simulate a real treatment session for contamination fear. During real treatment sessions, patients are exposed to the contaminants that they fear the most, similar to the way you were exposed to various objects during this study. Because we used deception, we are required to ask you to fill out this form indicating that you understand why deception was used, and that you agree to let us use your data. Please read through the form and sign if you agree to the terms.

Please do not discuss this study with anyone, so as not to give away the true nature of the study.

I would also like to review our debriefing form with you. As I mentioned at the beginning of the study, this study aims to evaluate various components of a treatment for contamination fear. This treatment can be very difficult for people that have significant contamination fears, as it involves exposing them to the contaminants they are most afraid of. Our intention is to modify this treatment to make it less difficult for people, which is why you were offered a pair of gloves before approaching some of the contaminants. Please take a minute to review this debriefing form. Also, there is a section of the form that provides you access to our online treatment manual, in case you or someone you know is having problems with anxiety and depression.

Please do not leave this form lying around in case someone should find it. Any last questions?

IF THIS IS A POOL PARTICIPANT: You will be credited for your participation using the online system, and you will receive a confirmation email once the credit has been given. Please be sure to keep this email for your records.

IF THIS IS A CASH DRAW PARTICIPANT: If you win one of the four cash prizes, you will be contacted via email to receive your prize.

Thank you again for participating. Have a great day!

Appendix F

Debriefing Form

Debriefing

Thank you for your time and cooperation. The purpose of this study is to evaluate different components of cognitive-behavioural treatment for contamination fear. This treatment can be particularly difficult for individuals with significant contamination fear, because it often involves exposure to contaminants they are very afraid of. For this reason, many people refuse the treatment entirely, or drop out before the treatment has a chance to help them. In conducting this study, our intention is to modify this treatment to make it more tolerable for people with significant fears. This is why you were offered a pair of latex-free gloves before approaching some of the contaminants, because we thought the gloves might make the approach easier for you. We hypothesize that participants will rate the condition in which they were offered gloves as more tolerable than the condition in which they did not have gloves. We also hypothesize that individuals with significant contamination fears will rate the gloves condition as even more tolerable than the no-gloves condition compared to people without significant fears.

If you have any questions or comments about this study or to contact the laboratory for your compensation, please contact Hannah Levy (ha_levy@live.concordia.ca; 514-848-2424, ext. 5965) or Dr. Adam Radomsky (adam.radomsky@concordia.ca). If you are interested in the results of this study, you may contact Hannah Levy at the completion of the study. Note that only global results, not individual results, will be released.

In our research, we ask you many questions about feelings related to anxiety and sadness. If at any time you feel that you need help related to these feelings or other problems, please go to the treatment manual on our website for information on local resources (see below). Also, please don't hesitate to contact us at the lab with any questions or concerns you might have.

http://www-psychology.concordia.ca/fac/radomsky/TSI%202010.pdf

Further reading:

Foa, E. B., Liebowitz, M. R., Kozak, M. J., Davies, S., Campeas, R., Franklin, M. E., et al. (2005). Randomized, placebo-controlled trial of exposure and response prevention, clomipramine, and their combination in the treatment of obsessive-compulsive disorder. *The American Journal of Psychiatry*, *162*, 151-161.

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