Experimental Investigations of the Judicious Use of Safety Behaviour in Exposure Therapy for Contamination Fear

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ABSTRACT

Experimental investigations of the judicious use of safety behaviour in exposure therapy for contamination fear

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Compulsive washing and contamination fear are among the most common symptoms of obsessive-compulsive disorder (OCD). Exposure and response prevention (ERP) is an effective treatment for OCD, but a substantial proportion of clients/patients refuse this treatment entirely or drop out prematurely. A proposed solution involves the judicious use of safety behaviour to enhance the acceptability of ERP. However, to this author's knowledge, there are currently no published guidelines for the judicious use of safety behaviour in exposure, and questions remain about how best to incorporate safety behaviour into existing treatments. For instance, which kinds of safety behaviour may be beneficial in treatment, and which may be harmful? Who decides when to eliminate the safety behaviour during treatment, the client/patient or the therapist? The present studies made a first attempt at addressing these questions. In the first study, a clinical sample of individuals with contamination-related OCD ($N = 60$) was randomized to receive an exposure session with no safety aid (ERP), a routinely-used safety aid (RU), or a never-used safety aid (NU). Significant reductions in contamination fear severity were observed in all conditions. However, participants in the NU condition demonstrated the lowest self-reported contamination fear severity at post-treatment. Further, the NU condition received the highest acceptability and anticipated adherence ratings. In the second study, a subclinical sample of undergraduate students ($N = 100$) was assigned to complete an exposure session for contamination fear under one of three fading conditions: participant-initiated, experimenter-initiated (based on time), or experimenter-initiated (based on participant-reported distress levels). Compared to the experimenter initiated time-based condition, the participant-initiated condition demonstrated significantly greater reductions in obsessive beliefs and peak fear, as well as marginally higher treatment expectancy ratings. There were no differences in outcome or acceptability between the participant-initiated and experimenter initiated distress-based

conditions. The results of these studies are discussed in terms of the cognitive-behavioural theory and treatment of anxiety and related disorders, and of the potential benefits of judiciously incorporating safety behaviour into effective treatments.

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I am most fortunate to have been supervised by Dr. Adam Radomsky, a supportive, funny, caring, understanding, humble, and above all, inspiring mentor. Adam embodies all of the best qualities of a supervisor, and I can only hope to emulate these qualities in my own career. Among his many attributes, I admire him most for his genuine caring for those who suffer from anxiety problems, and his unwavering determination to improve current treatments to better serve these individuals. I have no doubt that he will make a positive and lasting impact on mental health care in Canada and beyond.

I gratefully acknowledge committee members Drs. Michel Dugas and Roisin O'Connor. Their helpful comments and suggestions undoubtedly improved the quality of this dissertation, and I very much appreciate their support and input.

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CONTRIBUTION OF AUTHORS

The following thesis is comprised of two manuscripts:

Study 1 (Chapter 2)

Levy, H. C., & Radomsky, A. S. (under review). *Are all safety behaviors created equal? A comparison of novel and routinely-used safety behaviors in obsessive-compulsive disorder.* Manuscript submitted for publication.

Study 2 (Chapter 4)

Levy, H. C., & Radomsky, A. S. (under review). *It's the who not the when: An investigation of safety behavior fading in exposure to contamination.* Manuscript submitted for publication.

I was responsible for the conceptualization of the program of research that is presented in this dissertation, as well as for the two specific studies that are reported therein. I chose the research questions, study designs, hypotheses, and statistical plans. I primarily recruited, scheduled, and tested participants (in conjunction with student volunteers, see below). I conducted all the statistical analyses, interpreted the results, and wrote this dissertation. My supervisor, Dr. Adam Radomsky, met with me regularly throughout all stages of this research and consulted on the development, interpretation, and writing of this document, as well as on the components that were submitted for review and publication (see above). My committee members, Drs. Michel Dugas and Roisin O'Connor, recommended methodological changes and approved my design and statistical analyses at my dissertation proposal meeting in March, 2013.

For Study 1, I was assisted by two undergraduate volunteers (Marisa Mercuri and Lisa Serravalle). These individuals assisted with data collection and entry, as well as recruitment procedures. They conducted telephone screens to determine eligibility for the study, and conducted the behavioural approach tests. I provided supervision and training for all of these activities. I served as the study experimenter, and conducted all diagnostic interviewing and participant testing. A laboratory research assistant (Stefanie Lavoie) scored a portion of the diagnostic assessments in order to assess for inter-rater reliability. I was responsible for data cleaning and analyses, and I wrote the first draft of the manuscript. In collaboration with my supervisor Dr. Adam Radomsky, the manuscript was subsequently revised and re-submitted for publication.

For Study 2, I was assisted by an honours thesis student (Sarah McIlwaine) and by three undergraduate volunteers (Marisa Mercuri, Lisa Serravalle, and Edmine Serulien). These individuals assisted with data collection and entry, as well as with recruitment procedures. I provided training and supervision of these tasks. I served as the primary study experimenter, in conjunction with the honours thesis student who also served as an experimenter. I completed all data cleaning and analyses, and wrote the first draft of the manuscript. The manuscript was subsequently revised based on input and suggestions from my supervisor, Dr. Adam Radomsky, and the final version was submitted for publication.

I also wrote all other components of this dissertation, with recommendations from Dr. Adam Radomsky on the drafts. Both studies have been submitted for publication, and as such, are written in the third person, exactly as they appear in the submitted manuscripts.

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CHAPTER 1
GENERAL INTRODUCTION

Obsessive-compulsive disorder, contamination fear, and evidence-based treatment

Obsessive-compulsive disorder (OCD) is characterized by obsessions, or unwanted, intrusive, and distressing thoughts, images, or impulses, and/or compulsions, which are repetitive behaviours aimed at decreasing anxiety and/or preventing feared outcomes (APA, 2013). OCD affects 1-2% of the population (Kessler et al., 2005), and individuals with OCD experience significant functional impairment and poor quality of life as compared to healthy individuals (Huppert, Simpson, Nissenson, Liebowitz, & Foa, 2009; Norberg, Calamari, Cohen, & Riemann, 2008). OCD is a heterogeneous disorder, encompassing a wide variety of obsessions and compulsions (McKay et al., 2004; Rachman & Hodgson, 1980; Radomsky & Taylor, 2005). One of the most common symptoms of OCD is contamination fear, which is often accompanied by compulsive washing and cleaning rituals (Rachman, 2004; Rasmussen & Eisen, 1992; Rachman & Hodgson, 1980). For instance, Ball, Baer, and Otto (1996) reported that 75% of participants in OCD treatment studies endorsed washing and/or checking rituals. Furthermore, there is some evidence to suggest that individuals with compulsive washing rituals respond less well to cognitive-behavioural therapy (CBT) than individuals with other kinds of compulsions (Coelho & Whittal, 2001; McLean et al., 2001). This may be because contamination fears are persistent and unrelenting, and generally do not decay over time (Rachman, 2004; Tolin, Worhunsky, & Maltby, 2004). The complex and multi-faceted nature of contamination fear may also make this symptom more difficult to target in treatment. For example, a growing body of literature suggests that mental contamination, defined as feelings of contamination that arise without direct contact with a contaminant (Rachman, 2004), is commonly endorsed by individuals with contamination-related OCD (Coughtrey, Shafran, Lee, & Rachman, 2012; Radomsky, Rachman, Shafran, Coughtrey, & Barber, 2014). Disgust, which is a basic emotion that is characterized by a revulsion response and subsequent avoidance of perceived contaminants (Rozin & Fallon, 1987), has also been implicated in the onset and maintenance of contamination fear. For instance, Cisler, Brady, Olatunji, and Lohr (2010) found that disgust propensity interacted with certain domains of obsessive beliefs (e.g., the tendency to overestimate the likelihood of threat) to predict the severity of contamination fear, even after controlling for negative affect. Furthermore, disgust has been shown to habituate more slowly

than anxiety during exposure to threatening stimuli (e.g., Olatunji, Smits, Connolly, Willems, & Lohr, 2007), which may lead to poorer treatment response among anxious individuals with elevated disgust propensity (Olatunji, Wolitzky-Taylor, Willems, Lohr, & Armstrong, 2009). For all of these reasons, it is important to develop effective and acceptable treatments for contamination-related OCD.

Fortunately, there are several evidence-based treatments for OCD, including cognitive therapy (e.g., Freeston, Léger, & Ladouceur, 2001; McLean et al., 2001; Wilhem et al., 2005, 2009), pharmacotherapy consisting of selective serotonin reuptake inhibitors (e.g., Franklin & Foa, 2011; Greist et al., 1995; Zohar & Judge, 1996), and exposure and response prevention (ERP; e.g., Deacon & Abramowitz, 2004; Foa et al., 2005; Franklin & Foa, 2008, 2011; for a review, see McKay et al., 2015). ERP is arguably the most widely studied psychological treatment for OCD, perhaps due to its longstanding history. In 1966, Victor Meyer published the first case report of ERP in the treatment of OCD. As described by Meyer, the treatment consisted of preventing patients with OCD from engaging in compulsive behaviour, which eventually resulted in a "modification of expectations" regarding the necessity of these rituals. This "modification of expectations" method of treatment laid the foundation for what is now referred to as ERP, involving the gradual and systematic exposure to feared stimuli while preventing compulsive behaviour. Since 1966, the findings from numerous clinical trials support the efficacy of ERP (e.g., Abramowitz, Foa, & Franklin, 2003; Foa et al., 2005, 2013), and as such it is considered by some to be the "gold standard" treatment for OCD (March, Frances, Carpenter, & Kahn, 1997).

Despite the efficacy of ERP, 20-40% of treatment-seeking individuals decline to participate in ERP or drop out prematurely (Foa et al., 2005; Stanley & Turner, 1995; Whittal, Thordarson, & McLean, 2005). This means that a significant number of OCD sufferers are not receiving effective treatment for their OCD. Reasons for these problematic dropout rates are largely unknown, as there is a paucity of literature investigating predictors of refusal and dropout in OCD. Some research indicates that individuals with more severe OCD symptoms may be more likely to drop out of treatment (Aderka et al., 2011), whereas other research has not found differences in symptom severity between those who drop out of and those who complete OCD treatment (Foa et al., 2005; Rector, Cassin, & Richter, 2009; Whittal et al., 2005). Similarly, comorbid depression has been associated with premature dropout in individuals with OCD

(Aderka et al., 2011; Rector et al., 2009; Whittal et al., 2005), although other investigators have failed to replicate this effect (Mancebo, Eisen, Sibrava, Dyck, & Rasmussen, 2011). Given these mixed findings, it may be more informative to investigate client/patient *perceptions* of exposure therapy as a potential predictor of dropout, rather than baseline symptom severity. Indeed, in a longitudinal study of CBT utilization, Mancebo et al. (2011) found that fear of CBT was a commonly endorsed reason for refusal and/or dropout in individuals with OCD, perhaps due to the fact that exposure to feared stimuli often causes (albeit temporary) severe anxiety and distress. Consistent with these findings, Richard and Gloster (2007) found that vignette-based descriptions of exposure therapy, including ERP for OCD, were rated as unacceptable and/or unlikely to be helpful in a sample of individuals seeking treatment at a university-based clinic. In another study conducted at a university-based CBT clinic, Bados, Balaguer, and Saldaña (2007) reported that dissatisfaction with the treatment or therapist was a commonly reported reason for premature termination. As such, perceptions of treatment acceptability are likely to play a role in determining who drops out of ERP and other exposure-based treatments for anxiety disorders.

Furthermore, there is growing evidence to suggest that practitioners as well as clients may hold negative beliefs about exposure therapy for anxiety. For instance, Deacon, Lickel, Farrell, Kemp, and Hipol (2013) surveyed a sample of practitioners who were recruited from the website of the Anxiety Disorders Association of America (ADAA). In this study, respondents were asked to imagine a clinician delivering interoceptive exposure to a client with panic disorder, and then to rate the likelihood of certain negative outcomes (e.g., "the client would pass out/lose consciousness"). Results showed that the majority of participants rated all negative outcomes as at least somewhat likely to occur, with premature termination of the exposure session being the outcome that was rated as most likely to occur. It should be noted that only practitioners who reported that they were currently using exposure in the treatment of their anxious clients were included in the study, suggesting that even clinicians who are trained in exposure may have negative perceptions of the treatment. Given these findings, perhaps it is unsurprising that not all clinicians actually use exposure therapy in their practice. In a survey of licensed psychologists from three states, Becker, Zayfert, and Anderson (2004) found that only 17% of survey respondents reported that they were currently delivering exposure therapy to their

anxious clients. Taken together, these results indicate that exposure is effective but generally underutilized, both by clients/patients and by trained clinicians.

Consistent with these findings, Rachman, Radomsky, and Shafran (2008) theorized that exposure therapy can be unnecessarily demanding and threatening, thus increasing the likelihood of dropout from this treatment. To address this problem, the authors suggested that the judicious use of safety behaviour, defined as the careful and strategic incorporation of safety behaviour into the early and/or most challenging stages of treatment, may enhance the acceptability of exposure. Consistent with this theory, some research suggests that safety behaviour enhances the acceptability of CBT (Levy & Radomsky, 2014; Levy, Senn, & Radomsky, 2014; Milosevic & Radomsky, 2013a), whereas at least one other study did not find differences in perceptions of acceptability between traditional exposure and exposure with safety behaviour (ESB; Deacon, Sy, Lickel, & Nelson, 2010). Given the mixed findings, more research is needed to clarify the impact of safety behaviour on treatment acceptability, dropout, and outcome in CBT.

Safety behaviour

Safety behaviour has been defined as overt/observable (e.g., cleaning, washing) or covert/subtle (e.g., distraction, avoiding eye contact with feared stimuli) avoidance strategies that are carried out in feared situations to decrease anxiety and/or minimize the likelihood of perceived threat (Salkovskis, 1991; Salkovskis, Clark, & Gelder, 1996; Thwaites & Freeston, 2005). According to traditional cognitive-behavioural models of anxiety and related disorders, safety behaviour is proposed to prevent disconfirmatory experiences via a misattribution of safety in threatening situations. Due to this misattribution, anxious individuals are thought to fail to disconfirm the likelihood and/or relative dangerousness of their feared outcome(s) (Salkovskis, 1991; Salkovskis et al., 1996; Thwaites & Freeston, 2005). From this theory, it follows that safety behaviour may interfere with the efficacy of exposure-based treatments, as clients/patients who employ safety behaviour during treatment may falsely attribute the success of the exposure and/or the non-occurrence of feared outcomes to the presence of the safety behaviour. Consistent with this theory, numerous studies have shown that safety behaviour interferes with the efficacy of exposure, such that participants who used safety behaviour during exposure demonstrated poorer outcomes in terms of anxiety reduction and cognitive change than participants who refrained from using safety behaviour (Kim, 2005; McManus, Sacadura, & Clark, 2008; Salkovskis, Clark, Hackmann, Wells, & Gelder, 1999; Sloan & Telch, 2002; Taylor

& Alden, 2010). As demonstrated by Powers, Smits, and Telch (2004), even the *availability* of safety behaviour can undermine treatment success. In this study, participants who were given access to safety behaviour and told to use it "only if they must" demonstrated poorer outcomes as compared to participants who did not use safety behaviour during exposure. Based on these findings, many cognitive-behavioural treatment manuals and books advise against the use of safety behaviour during exposure, or recommend that it be eliminated as soon as possible (e.g., Abramowitz, Deacon, & Whiteside, 2011; Antony & Swinson, 2000; Foa, Yadin, & Lichner, 2012). In fact, a novel transdiagnostic treatment that emphasizes safety behaviour elimination has been developed, and it showed initial promise as compared to wait-list control (Schmidt et al., 2012). Taken together, these findings support the notion that safety behaviour is counter-therapeutic, and thus should be discouraged in treatment.

In contrast, numerous other studies have failed to find a deleterious effect of safety behaviour on treatment outcome in exposure therapy (Hood, Antony, Koerner, & Monson, 2010; van den Hout, Engelhard, Toffolo, & van Uijen, 2011; Milosevic & Radomsky, 2008, 2013b; Rachman, Shafran, Radomsky, & Zysk, 2011; Sy, Dixon, Lickel, Nelson, & Deacon, 2011). In these investigations, participants using safety behaviour during exposure demonstrated comparable improvement in terms of fear reduction and cognitive change as participants who did not use safety behaviour. In fact, some studies have even found more favourable outcomes among participants receiving ESB than those receiving traditional exposure. For instance, Milosevic and Radomsky (2013b) found that spider-fearful participants who used safety gear (e.g., gloves, face masks) during a behavioural experiment with a spider demonstrated greater change in targeted threat beliefs about spiders than participants who did not use safety gear. Importantly, these studies do not support the theory that safety behaviour is counter-therapeutic, and instead suggest that safety behaviour may actually *facilitate* disconfirmation in some cases. Consistent with these contradictory findings, some theoretical work has questioned the necessity of eliminating safety behaviour in treatment (Parrish, Radomsky, & Dugas, 2008; Rachman et al., 2008), while others have called for more accurate categorization of safety behaviour as adaptive (e.g., used to facilitate approach behaviour and/or the acquisition of disconfirmatory information) versus maladaptive (e.g., used to prevent unlikely or imagined feared catastrophes) coping strategies (Thwaites & Freeston, 2005). Proper categorization of safety behaviour is indeed needed in order to clarify the mixed findings and elucidate the conditions under which

safety behaviour may be detrimental versus beneficial to treatment outcome. Nevertheless, it is clear that the *unqualified* rejection of safety behaviour is unnecessary and unfounded (Rachman et al., 2008).

In addition to Salkovskis' (1991) initial formulation, several other theories have been proposed to explain the effect of safety behaviour in CBT, either in terms of being counter-therapeutic or potentially facilitative. Traditional behavioural theory suggests that safety behaviour interferes with initial fear activation (IFA), such that individuals who employ safety behaviour during exposure fail to achieve an adequate level of anxious arousal for corrective learning to occur. According to emotional processing theory, greater IFA corresponds to better outcomes in exposure-based treatments. As such, any activities which reduce IFA (e.g., employing safety behaviour to reduce anxiety) will interfere with the success of treatment (Foa & Kozak, 1986). In a more cognitively-based theory, Sloan and Telch (2002) proposed that safety behaviour prevents the processing of disconfirmatory experiences, as individuals who employ safety behaviour have less attentional resources available to process threat-relevant information. In a neurobehavioural approach, inhibitory learning theory posits that safety behaviour has the potential to interfere with the development of inhibitory (non-threat) associations during exposure (Craske, Treanor, Conway, Zbozinek, & Vervliet, 2014). However, these authors noted that the degree to which safety behaviour interferes with inhibitory learning depends on the strength of the safety behaviour in reducing anxiety, as well as the strength of the feared stimulus in provoking anxiety. As such, the use of safety behaviour may not *necessarily* be counter-therapeutic so long as the exposure is potent enough to elicit the fear response and thus, make it possible to acquire accurate threat-relevant information.

To explain the potentially facilitative effects of safety behaviour, Rachman et al. (2008) suggested that safety behaviour may enhance the efficacy and acceptability of CBT by increasing perceptions of self-efficacy and control during treatment. According to Bandura's (1977) self-efficacy theory, activities which diminish anxiety and promote a sense of mastery and control in threatening situations will reduce fear. Based on this theory, it could be that safety behaviour enhances treatment efficacy by reducing anxiety and promoting perceptions of confidence and control during exposure. Of course, it should be noted that these theories generally do not address the categorization of safety behaviour as adaptive versus maladaptive to treatment, and instead refer to all safety behaviour as belonging in a single category. This is problematic, as

both theory and research support the notion that safety behaviour is highly idiosyncratic (e.g., Salkovkis et al., 1996), and thus cannot be considered a unitary construct. As mentioned previously and discussed by Thwaites and Freeston (2005), efforts to properly categorize these behaviours are critical in order to inform cognitive-behavioural theory and research on safety behaviour.

Treatment acceptability

According to Rachman et al. (2008), the judicious use of safety behaviour may enhance the acceptability of CBT. Treatment acceptability has been defined 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 and related disorders, previous research has shown that CBT is more acceptable than a variety of other treatments, including pharmacotherapy (Deacon & Abramowitz, 2005; Hofmann et al., 1998; Huppert, Franklin, & Foa, 2003), psychodynamic therapy (Becker, Darius, & Schaumberg, 2007), and Gestalt therapy (Ertl & McNamara, 2000). For instance, in a sample of individuals seeking treatment for anxiety disorders, vignette descriptions of CBT received higher acceptability ratings than vignette descriptions of pharmacotherapy (Deacon & Abramowitz, 2005), even though a large number of participants in this study had a recent history of pharmacotherapy, not psychotherapy. In a randomized-controlled trial comparing the efficacy of imipramine and CBT for panic disorder, Hofmann et al. (1998) reported that 103 (34%) participants declined to participate in the trial due to unwillingness to receive medication, as compared to only one (.3%) participant who declined due to unwillingness to receive CBT. Taken together, these findings suggest that CBT is the preferred treatment for anxiety and related disorders. As such, it is surprising and unfortunate that so many treatment-seeking individuals refuse or drop out of CBT for anxiety problems, including ERP for OCD (e.g., Foa et al., 2005). As reviewed previously, the reasons for these high dropout rates are generally unknown, although preliminary evidence suggests that negative perceptions of exposure therapy may be one explanation. Clearly more work is needed to enhance the acceptability of ERP and other exposure-based treatments, and the judicious use of safety behaviour may be a promising solution.

Indeed, recent research has shown that vignette descriptions of CBT with the judicious use of safety behaviour received higher acceptability and anticipated adherence ratings than

descriptions of traditional CBT (Levy et al., 2014; Milosevic & Radomsky, 2013a). To expand upon this work, Levy and Radomsky (2014) compared the acceptability of *in vivo* exposure to various contaminants with and without the use of safety behaviour and found higher acceptability and anticipated adherence ratings for the safety behaviour condition. By contrast, Deacon et al. (2010) did not find differences in acceptability between traditional *in vivo* exposure and ESB for claustrophobic fear. Overall, the findings support the acceptability-enhancing potential of safety behaviour in CBT, although more research is needed to clarify the mixed findings. It could be that safety behaviour may enhance acceptability and promote treatment retention under certain conditions, such as among individuals with more severe anxiety problems (Rachman et al., 2008) or among clients/patients who failed to respond to ERP (Rachman et al., 2011). These are important questions that await future empirical attention. For now, the initial promise that safety behaviour has shown in enhancing treatment acceptability warrants further investigation of its possible utility in CBT.

Rationale and implications for the current program of research

In summary, most cognitive-behavioural models of anxiety disorders suggest that safety behaviour maintains anxiety by preventing disconfirmatory experiences. However, empirical research on the effect of safety behaviour in CBT is inconclusive, suggesting that its use is not *always* counter-therapeutic. Furthermore, recent studies support the notion that safety behaviour may be beneficial in treatment, both in terms of promoting cognitive change and enhancing treatment acceptability. Unfortunately, to this author's knowledge, there are currently no published guidelines for the judicious use of safety behaviour in CBT, and many questions remain about if, when, and/or how best to incorporate safety behaviour into existing treatments. For example, which kinds of safety behaviour may be beneficial in treatment, and which may be harmful? Who should decide when to eliminate the safety behaviour during treatment, the client/patient or the therapist? The current research program aimed to make a first attempt at addressing these questions. Study 1 compared the efficacy and acceptability of exposure for contamination fear with different kinds of safety behaviours, classified by participants' history of and experience with using them. Study 2 examined the efficacy and acceptability of participant- and experimenter-initiated fading of safety behaviour during exposure to contamination-related stimuli.

This research may have several implications for the cognitive-behavioural theory and treatment of anxiety and related problems. First, the majority of previous studies on safety behaviour have employed undergraduate student samples, which limits the generalizeability of the findings to clinical samples. As such, recruiting clinical and subclinical participants in the current research will address this gap in the literature, and thus may foster more direct implications for the theory and treatment of anxiety disorders. Second, by attempting to elucidate the conditions under which safety behaviour may be beneficial versus detrimental to treatment, this series of studies may clarify mixed findings on the effects of safety behaviour in CBT. Third, investigating the practical aspects of using safety behaviour in exposure bridges the gap between science and practice, and to this end may inform the development of novel cognitive-behavioural interventions for anxiety and related problems.

Design

Both studies were experimental in nature. Study 1 investigated the efficacy and acceptability of exposure with different types of safety behaviour. The design was mixed factorial, with between- and within-participants factors. Clinical participants with contamination-related OCD were randomized to receive an exposure session for contamination fear with no safety aid (ERP), a routinely-used safety aid (RU), or a never-used safety aid (NU). Measures of contamination fear severity were administered before and after the exposure session, and perceptions of acceptability and anticipated adherence were assessed immediately following the session.

Study 2 investigated the efficacy and acceptability of participant- and experimenter-initiated fading of safety behaviour during exposure. Similar to Study 1, the design was mixed factorial, with both between- and within-participants factors. Undergraduate student participants with subclinical levels of contamination fear were assigned to receive an exposure session for contamination fear under one of three fading conditions: 1) participant-initiated, in which the participant decided when to eliminate the safety aid (PI condition); 2) experimenter-initiated, in which the timing of safety behaviour fading was yoked to the timing observed in the PI condition in order to control for time (ET condition); or 3) experimenter-initiated, in which safety behaviour fading was based on decreasing Subjective Units of Distress Scale (SUDS) ratings (ED condition). As in Study 1, measures of contamination fear severity were administered at pre- and post-exposure, and treatment acceptability was assessed after the exposure session.

Hypotheses

Study 1 tested three hypotheses: 1) exposure would be effective in reducing contamination fear severity across conditions; 2) the RU condition would demonstrate poorer treatment outcome as compared to the NU and ERP conditions; and 3) the NU and RU conditions would be rated as more acceptable than ERP.

Study 2 tested two hypotheses: 1) the PI condition would demonstrate superior treatment outcome as compared to both the ET and the ED conditions; and 2) the PI condition would be rated as more acceptable than both the ET and the ED conditions.

CHAPTER 2:
ARE ALL SAFETY BEHAVIORS CREATED EQUAL? A COMPARISON OF NOVEL AND ROUTINELY-USED SAFETY BEHAVIORS IN OBSESSIVE-COMPULSIVE DISORDER

Obsessive-compulsive disorder (OCD) is characterized by obsessions (i.e., recurrent, intrusive, and distressing thoughts) and/or compulsions (i.e., repetitive behaviors aimed at reducing anxiety; APA, 2013). OCD is among the leading causes of disability worldwide (WHO, 2008), and individuals with OCD may often experience severe functional impairment and poor quality of life (Norberg, Calamari, Cohen, & Riemann, 2008). Contamination fears and compulsive washing are common symptoms of OCD (Rachman, 2004; Rachman & Hodgson, 1980), and may be less responsive to cognitive-behavioral therapy (CBT) than other OCD symptoms (Coelho & Whittal, 2001; McLean et al., 2001). Therefore, it is important to foster the development of effective and acceptable treatments for contamination-related OCD. As such, the purpose of the current study was to examine the efficacy and acceptability of a single session of exposure with safety behavior (ESB) for contamination fear. To further the emerging research on ESB, in the present study we aimed to determine which (if any) kinds of safety behaviors may be beneficial versus detrimental to symptom reduction following a single-session experimental intervention.

ESB was initially proposed as a potential solution for reducing problematic dropout rates in exposure-based treatments for anxiety disorders (Parrish, Radomsky, & Dugas, 2008; Rachman, Radomsky, & Shafran, 2008). Although previous research strongly supports the efficacy of exposure and response prevention (ERP) for OCD (Deacon & Abramowitz, 2004; Foa et al., 2005; Franklin & Foa, 2011), 20-40% of individuals refuse the treatment entirely or drop out prematurely (Foa et al., 2005; Stanley & Turner, 1995; Whittal, Thordarson, & McLean, 2005). Despite the fact that this refusal and dropout rate is similar to that of CBT for other anxiety disorders (e.g., Hofmann & Smits, 2008), it suggests that a large number of clients/patients are not receiving effective treatment for their OCD. Reasons for these problematic dropout rates are largely unknown. In a longitudinal study of CBT utilization, Mancebo, Eisen, Sibrava, Dyck, and Rasmussen (2011) found that fear of CBT was a common reason for treatment refusal and/or dropout among individuals with OCD. Thus, it is plausible that perceptions of acceptability play a role in treatment refusal and/or dropout in ERP. Further,

exposure therapy is underutilized among practitioners; Becker, Zayfert, and Anderson (2004) surveyed 852 licensed doctoral level psychologists and found that only a minority were delivering exposure-based treatments to their anxious clients. Commonly reported concerns among exposure therapists include client decompensation, symptom exacerbation, and premature termination (Deacon, Lickel, Farrell, Kemp, & Hipol, 2013). Taken together, these findings suggest that practitioners as well as clients may have negative perceptions about exposure-based treatments for anxiety disorders.

To address the dropout problem, Rachman et al. (2008) proposed that the judicious use of safety behavior, defined as the careful and strategic incorporation of safety behavior in the early and/or more challenging stages of treatment, may enhance the acceptability of exposure therapy and reduce treatment dropout rates. Safety behaviors are overt or covert avoidance strategies used in threatening situations to reduce anxiety and/or prevent feared outcomes (Salkovskis, 1991; Salkovskis, Clark, & Gelder, 1996). Most current cognitive-behavioral models suggest that safety behavior maintains anxiety by interfering with threat disconfirmation, as individuals who use safety behavior in anxiety-provoking situations may falsely attribute the non-occurrence of feared outcomes to the presence of the safety behavior (Salkovskis, 1991; Salkovskis et al., 1996). However, empirical research investigating the effect of safety behavior on treatment outcome is inconclusive. Several studies have shown that both the use (Kim, 2005; McManus, Sacadura, & Clark, 2008; Salkovskis, Clark, Hackmann, Wells, & Gelder, 1999) and availability (Powers, Smits, & Telch, 2004) of safety behavior undermines the efficacy of exposure-based treatments. In contrast, other studies have found comparable outcomes following traditional exposure and ESB (Hood, Antony, Koerner, & Monson, 2010; van den Hout, Engelhard, Toffolo, & van Uijen, 2011; Milosevic & Radomsky, 2008, 2013a; Rachman, Shafran, Radomsky, & Zysk, 2011; Sy, Dixon, Lickel, Nelson, & Deacon, 2011). Given the mixed findings, it is possible that safety behavior does not *necessarily* interfere with the efficacy of exposure.

In fact, there may be some benefits to using safety behavior in CBT. For instance, previous studies have shown that safety behavior enhances behavioral approach to feared stimuli during exposure (Milosevic & Radomsky, 2008, 2013a), which may facilitate the acquisition of disconfirmatory information. Indeed, Milosevic and Radomsky (2013a) reported that spider-fearful participants who used safety gear during a behavioral experiment with a live tarantula

demonstrated greater reductions in their targeted threat beliefs about spiders than participants who did not use safety gear. Further, safety behavior has been shown to increase perceptions of control over distressing emotions (e.g., disgust) during exposure (van den Hout et al., 2011), which may also facilitate cognitive change in treatment. With regard to acceptability, some research comparing the acceptability of CBT with and without safety behavior has found higher acceptability ratings for interventions incorporating safety behavior (Levy & Radomsky, 2014; Levy, Senn, & Radomsky, 2014; Milosevic & Radomsky, 2013b), whereas other studies have found no differences in acceptability ratings between traditional exposure and ESB (Deacon, Sy, Lickel, & Nelson, 2010). Based on these studies, safety behavior may facilitate cognitive change and enhance treatment acceptability, both of which are important for effective treatment. Of course, more research is needed to clarify the impact of safety behavior in CBT, particularly in light of mixed findings regarding treatment outcome and perceptions of acceptability.

To the best of our knowledge, there are currently no published guidelines for the judicious use of safety behavior in CBT, and many questions remain about whether and/or how best to incorporate safety behavior into treatment. For example, which kinds of safety behavior may be beneficial in treatment (e.g., promote behavioral approach), and which may be harmful (e.g., prevent threat disconfirmation)? Several authors have addressed this question, yet there is no consensus about how best to classify safety behaviors as adaptive (e.g., used to facilitate approach behavior and/or the acquisition of helpful information) or maladaptive (e.g., used to prevent imagined catastrophes) coping strategies (Thwaites & Freeston, 2005). For instance, Salkovskis et al. (1999) suggested that safety behaviors which are employed in order to avoid imagined disastrous consequences (e.g., contracting an illness) may be classified as maladaptive coping strategies that will interfere with disconfirmation. Goetz and Lee (2015) recently proposed the classification of safety behavior as preventive (i.e., used to decrease the strength or intensity of exposure to a feared stimulus) or restorative (i.e., used to restore safety following exposure to a feared stimulus). Another approach is to distinguish safety behaviors based on the degree to which they prevent the processing of disconfirmatory information (Telch & Lancaster, 2012; Telch & Plasencia, 2010). Of course, more information about how to appropriately classify these behaviors is critical to inform treatment development and delivery, as safety behaviors which are deemed maladaptive and/or likely to interfere with disconfirmation would not be appropriate for use in treatment.

In the present study, we approached the classification of safety behaviors as beneficial or detrimental to exposure based on their novelty. In a clinical sample of individuals with contamination-related OCD, the efficacy of a single session of traditional exposure (ERP) was compared to a single session of exposure with one of two safety aids: one which the participant routinely uses ("RU" condition), or one which the participant has never used ("NU" condition). Due to their novelty, never-used safety aids may be less likely to interfere with treatment and cognitive change because they have not come to be associated with the prevention or avoidance of feared outcomes. In fact, several studies demonstrating comparable outcomes following traditional exposure and ESB have provided participants with novel safety aids for use during exposure (e.g., "beekeeping equipment" as employed by Milosevic & Radomsky, 2008). By contrast, the frequent use of routinely-used safety aids may have established an (erroneous) association between the presence of the safety aid and the non-occurrence of threatening outcomes, making them detrimental to treatment. Furthermore, routinely-used safety aids employed by individuals with OCD are likely to be maintaining the anxiety problem, as the safety aids continue to be used despite the fact that anxiety persists and OCD symptoms remain. Finally, previous authors have suggested that the failure to find differences in outcome between exposure and ESB may be explained by poor ecological validity regarding safety behaviors provided by study experimenters and those commonly employed by anxious individuals (Hood et al., 2010; Telch & Lancaster, 2012). As such, we felt it was important to examine the impact of routinely-used safety aids (which are, by nature, commonly employed by anxious individuals) on the efficacy of exposure.

Our classification of safety behavior was different from other classification systems that have been proposed (e.g., Goetz & Lee, 2015), because the focus of the classification was on the *novelty* of the safety behavior (i.e., the frequency with which it is used), rather than the *function* of the safety behavior. For example, Goetz and Lee (2015) classified tissues as "preventive" (not "restorative") safety aids because they prevent contact with a feared contaminant; in the current experiment, tissues were classified based on the frequency with which they are used by a given participant in feared situations (i.e., regularly or never), irrespective of their preventive versus restorative properties.

The current study tested three hypotheses: 1a) exposure would be effective in reducing contamination fear severity across conditions; 1b) the RU condition would demonstrate poorer

exposure outcome as compared to the NU and ERP conditions; and 2) the two safety behavior conditions would be rated as more acceptable than ERP.

Method

Participants

After exclusions (see description below), participants were 57 individuals who met DSM-IV diagnostic criteria for OCD and reported clinically-significant contamination fears and/or compulsive washing (i.e., greater than one hour spent thinking about contamination and/or engaging in washing behavior; APA, 2000). Participants were recruited for a study evaluating a new treatment component for contamination fear via internet advertisements, flyers posted at Concordia University, and from a clinical registry of individuals who have previously participated in our research and agreed to be recontacted about future studies.

Of the 61 individuals who completed the diagnostic interview (see Measures), 60 met criteria for OCD and reported clinically-significant contamination fears and/or compulsive washing. These 60 participants were randomized to condition (i.e., NU, RU, or ERP) via random selection of an index card containing the number one, two, or three from an envelope, and then completed the study. Three participants were excluded (see description below), leaving a final sample of 57 participants. The majority of the included participants was female (n = 34), ranging in age from 18 to 80 (M = 33.6, SD = 14.4) years. Most participants identified their ethnic background as Caucasian (n = 34), with the rest identifying as Arab/West Asian (n = 6), South Asian (n = 4), Black (n = 3), Latin-American (n = 3), Other (n = 3), Chinese (n = 2), and South East Asian (n = 2). Twenty-four participants reported that they had taken medication for psychological problems (either currently or in the past), including selective serotonin reuptake inhibitors (SSRIs; n = 16), serotonin norepinephrine reuptake inhibitors (SNRIs; n = 5), atypical antipsychotics (n = 3), benzodiazepines (n = 3), anticonvulsants (n = 3), sleep medication (n = 3), unspecified medication for anxiety and/or depression (n = 3), and psychostimulants (n = 1). Twenty-four participants reported having previously received psychotherapy.

In terms of diagnostic status, most included participants had a primary diagnosis of OCD (n = 41), with the rest endorsing primary diagnoses of major depression (n = 4), generalized anxiety disorder (GAD; n = 4), specific phobia (n = 4), social anxiety disorder (SAD; n = 3), and posttraumatic stress disorder (PTSD; n = 1). The number of comorbid diagnoses ranged from 0

to 6 (*M* = 1.2, *SD* = 1.1), and besides OCD (*n* = 16), the most common comorbid diagnoses were SAD (*n* = 20), GAD (*n* = 8), and specific phobia (*n* = 7).

Measures

Diagnostic interview. Participants' diagnoses were obtained using the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Di Nardo, Brown, & Barlow, 1994), a semi-structured diagnostic interview that assesses the severity of anxiety, mood, substance use, somatoform, and psychotic disorders on a 9-point scale ranging from 0 (*none)* to 8 (*very severe*). The ADIS-IV has demonstrated adequate to excellent inter-rater reliability (*r* = .68-.99; Tsao, Lewin, & Craske, 1998) and retest reliability (Di Nardo, Moras, Barlow, Rapee, & Brown, 1993). In the current study, the ADIS-IV was administered in order to confirm OCD diagnosis and to assess for the presence of contamination fear and/or compulsive washing symptoms. The interview was administered by a well-trained senior doctoral student in clinical psychology, who was blind to condition assignment at the time of the interview. To ensure diagnostic reliability with regard to the primary eligibility criteria for the study (i.e., presence of OCD diagnosis and clinically-significant contamination fears and/or compulsive washing), an independent rater listened to 20% of audio recordings of the diagnostic interview and coded the presence or absence of OCD diagnosis and the severity of contamination fears and/or compulsive washing. This independent rater was a research assistant with a bachelor's degree in psychology and over 10 years of experience administering the ADIS-IV and other semi-structured interviews to clinical participants. There was 100% agreement across raters for the presence of OCD diagnosis and the severity of contamination fear (severity ratings across raters were within one point of each other on the ADIS-IV severity scale).

Behavioral approach test (BAT). The BAT is a commonly used behavioral index of fear. In the current study, participants were asked to approach a "dirty" bedpan (i.e., a bedpan filled with water and yellow food coloring; see Materials) as close as they were able on an 18-point hierarchy, ranging from standing outside the room containing the bedpan with the door closed to touching the inside rim of the bedpan with both hands and then touching one's arms and chest. This BAT was adapted from previous research on compulsive washing behavior (Cougle, Wolitzy-Taylor, Lee, & Telch, 2007; Najmi, Tobin, & Amir, 2012). Participants completed the BAT before and after the exposure session, in order to assess changes in contamination fear severity when in the presence of an independent (i.e., not presented during

the exposure session) stimulus. Participants were not permitted to use safety aids during the BATs. The BAT was administered by a well-trained undergraduate student in psychology who was blind to condition. To ensure that this independent evaluator remained blind to condition assignment for the duration of the study, the experimenter did not speak about the study or provide any details about the exposure session until after the post-exposure BAT was completed.

Self-report measures. The following self-report measures were also administered.

Contamination fear. Participants completed the Vancouver Obsessional Compulsive Inventory (VOCI; Radomsky et al., 2006; Thordarson et al., 2004), which is a 55-item questionnaire that assesses the severity of OCD symptoms. Participants are asked to rate the degree to which the items are true of them on a 5-point Likert scale (0 = *not at all* and 4 = *very much*). The VOCI has demonstrated excellent internal consistency in student ($\alpha = .96$) and clinical ($\alpha = .94$) samples, as well as convergent and divergent validity (Radomsky et al., 2006; Thordarson et al., 2004). For the purposes of the current study, only the 12-item contamination subscale of the VOCI ("VOCI-Contamination") was included in the analyses in order to assess changes in contamination fear severity from pre- to post-exposure, and it demonstrated adequate internal consistency at both time points (pre-exposure $\alpha = .84$; post-exposure $\alpha = .86$).

Subjective distress. The Subjective Units of Distress Scale (SUDS; Wolpe, 1958) is a measure of subjective fear during behavior therapy. Participants are asked to rate their level of subjective distress on a scale from 0 (*neutral*) to 100 (*worst distress you can imagine*). In this study, the SUDS was administered at two time points during the BAT (i.e., before approaching the contaminant, the Anticipatory SUDS rating, and after approaching the contaminant, the Peak SUDS rating), in order to assess pre- to post-exposure changes in subjective distress when in the presence of an independent (i.e., not used during the exposure session) stimulus. The SUDS was administered by the independent evaluator who was blind to condition (see above).

Treatment acceptability. Participants completed the Treatment Acceptability/Adherence Scale (TAAS; Milosevic, Levy, Alcolado, & Radomsky, in press), which is a 10-item scale that assesses acceptability of and anticipated adherence to a given treatment. Participants are asked to rate their agreement with several statements about the treatment on a 7-point Likert scale (1 = *disagree strongly* and 7 = *agree strongly*). For the purposes of the current study, the TAAS was administered following the exposure session, and when completing the TAAS, participants were asked to consider the acceptability of the exposure session as if it were incorporated into a

complete treatment package (i.e., several exposure sessions, instead of just one). The TAAS was chosen as the measure of acceptability in the current study because it assesses acceptability and anticipated adherence, both of which we felt were important to assess given that Rachman et al. (2008) proposed that safety behavior may enhance acceptability and reduce dropout in exposure-based treatments for anxiety disorders. The TAAS showed adequate internal consistency in the current sample ($\alpha = .81$).

Materials

Contaminants. Prior to the exposure session, participants were presented with six contaminants, including rummaging through a partly filled garbage basket containing crumpled paper towels, tissues, and food wrappers; handling old and worn bills and coins; rubbing the bottom of their shoes; handling an old grimy telephone; handling a test tube labeled "PATH 194" containing red food coloring, which was housed inside a sealed biohazard bag; and handling discarded laboratory materials (e.g., a urine cup), contained inside a sealed biohazard bag. Similar contaminants have been used in previous research on exposure-based treatment for contamination fear (van den Hout et al., 2011; Rachman et al., 2011). Participants were asked to touch the six contaminants in random order and to rate their SUDS while touching each contaminant. The object that evoked the highest SUDS level was used in the exposure session.

Safety aids. All participants were asked to bring a routine safety aid to the laboratory (see Participants), and if randomized into the RU condition, they were told to use this safety aid during the exposure session. If participants brought more than one safety aid to the laboratory, they were asked to indicate which one is most important for them to have when feeling anxious about contamination, and told to use this safety aid during the exposure session. If randomized into the NU condition, participants were offered a safety aid that they did not routinely use, that was different from the one they brought in with them. For instance, a participant who brought hand sanitizer to the laboratory may have been offered hygienic wipes to use during the exposure session. To assign this safety aid, several names of safety aids (all of which were different from the one the participant brought in; e.g., gloves, hygienic wipes) were placed in a hat and then one was chosen at random. Preliminary analyses revealed that the assigned safety aids were indeed "never used" (see Manipulation Check, below). If randomized to ERP, participants were not permitted to use any safety aids during the exposure session.

"Dirty" bedpan. A bedpan filled with water and yellow food coloring was used as the contaminant for the pre- and post-exposure BATs. A similar contaminant has been used in previous research on contamination fear (Levy & Radomsky, 2014; Olatunji, Lohr, Sawchuck, & Tolin, 2007). Prior to completing the BAT, participants were told "inside this room [independent evaluator pointed to the testing room] is a dirty bedpan".

Procedure

Prior to participating, interested individuals completed a telephone screen during which they were asked standardized questions about contamination fears and washing behavior, depressive symptoms and suicidal ideation, current mania and psychosis, and current substance abuse. The phone screen also assessed routine use of overt safety behavior with the following question: "When you are feeling anxious or fearful about contamination or germs, is there anything you do to feel more comfortable? For instance, some people like to always have hand sanitizer on them to use in case they feel contaminated. Is there anything like this that you do?" Participants were then asked to describe the nature and use of their overt safety aids. Callers who endorsed clinically-significant contamination fears and/or compulsive washing and routine use of overt safety aids (defined as frequent use of one or more safety aids and/or at least one safety aid is usually or always with them when they go out) and who denied current symptoms of mania and psychosis were invited to participate in the study, and were asked to bring their safety aid(s) along with them to the laboratory.

Following the informed consent process, participants completed the ADIS-IV with the experimenter, and eligible participants (see Participants) were then asked to complete a battery of self-report questionnaires, including a demographics questionnaire and the VOCI-Contamination. They then completed the pre-exposure BAT with the independent evaluator who was blind to condition. After the BAT, participants were randomized to condition and presented with the six contaminants (see Materials). Once the most distressing contaminant was chosen, participants were provided with a description of and rationale for exposure therapy, and were then told that "exposure can be conducted with or without safety aids, or objects that help people to feel more comfortable when they are anxious, like the [name of routinely-used safety aid] you brought in today. Safety aids may or may not be helpful during exposure. Some researchers think that they prevent people from overcoming their fears, and others think that they help people to overcome their fears. We are trying to help find an answer to this question". If this was one

of the safety behavior conditions, the rationale continued as follows: "You have been assigned to the condition where you will use [your own safety aid/a safety aid that we provide] during the exposure session". If this was the ERP condition, the rationale continued with, "You have been assigned to the condition where you will not use any safety aids during the exposure session".

Participants then completed the exposure session, which involved 20 exposure trials to the chosen contaminant. Each trial consisted of touching the contaminant, either with (RU or NU condition) or without (ERP) a safety aid, and then waiting for a 30-second delay prior to the next trial (modeled after previous research; see van den Hout et al., 2011 and Rachman et al., 2011). Following the session, participants completed the TAAS and were then given a short break during which they were told to read magazines in the testing room. After the break, participants completed the VOCI-Contamination and the post-exposure BAT with the independent evaluator. They were then fully debriefed, informed that the "contaminants" were not actually contaminated, and compensated $40 for their participation.

Statistical Analyses

To assess baseline comparability of groups, a series of one-way analyses of variance (ANOVAs) were conducted on the demographic variables and on the following pre-exposure measures: ADIS-IV OCD severity, VOCI-Contamination, BAT, and SUDS ratings. These analyses revealed several baseline differences (see below). To test the first hypothesis concerning overall exposure efficacy, a series of 3 x 2 (condition x time) mixed ANOVAs were conducted on VOCI-Contamination, BAT, and SUDS ratings at pre- and post-exposure. To test the second hypothesis concerning between-condition differences in outcome, a series of one-way analyses of covariance (ANCOVAs) were conducted on each of the dependent variables at post-exposure, controlling for the corresponding pre-exposure variable (i.e., to control for baseline differences, see below). To test the third hypothesis concerning between-condition differences in treatment acceptability, a one-way ANOVA was conducted on TAAS scores.

Results

Exclusions

Three participants were excluded for the following reasons: one participant in the ERP condition refused to complete 20 exposure trials; one participant in the RU condition did not adequately engage with the exposure session (e.g., kept eyes closed to avoid looking at the contaminant); and one participant in the NU condition refused to use the assigned safety aid.

These events occurred during the exposure session (i.e., after randomization to condition). These three participants were excluded from the analyses, leaving a final sample of 57 participants (n = 19 per condition).

Safety Aids

The following safety aids were brought in by participants assigned to the RU condition and used for the duration of the exposure session: hand sanitizer (n = 12), hygienic wipes (n = 4), tissues (n = 2), and gloves (n = 1). The following safety aids were assigned to participants randomized to the NU condition and used for the duration of the exposure session: latex-free gloves (n = 8), hygienic wipes (n = 5), tissues (n = 5), and hand sanitizer (n = 1). Hygienic wipes and hand sanitizer were used after each touch, whereas gloves and tissues were used during each touch (i.e., to prevent contact with the contaminant). All participants in the ERP condition complied with instructions and did not use any safety aids during the exposure session.

Manipulation Check

To ensure that the assigned safety aid was indeed "never used", all participants in the NU condition were asked to indicate how often they used the assigned safety aid when they are feeling anxious about contamination in a typical week. As intended, most participants reported that they never used the assigned aid (n = 15), with the others reporting that they rarely (n = 2) or sometimes (n = 2) used the aid.

Group Comparisons at Pre-Exposure

Groups did not differ with respect to age [$F(2, 54) = .31$, $p = .739$] or sex [$X^2(2) = 1.02$, $p = .600$]. There was a trend for group differences on previous pharmacological treatment [$X^2(2) = 5.61$, $p = .060$], and significant group differences on previous psychotherapy [$X^2(2) = 8.21$, $p = .017$]. Despite random assignment, groups significantly differed on all baseline symptom measures (all Fs > 3.65, all ps < .05), and there was a trend for mean differences on VOCI-Contamination scores, $F(2, 54) = 2.83$, $p = .068$. See Table 1 for means and standard deviations of all symptom measures at pre- and post-exposure, including mean comparisons of baseline symptom severity between groups.

Table 1

Means and Standard Deviations of Symptom Measures at Pre- and Post-Exposure

Measure	Pre-Exposure, *M*(*SD*)			Post-Exposure, *M(SD)*		
	Never (*n* = 19)	Routine (*n* = 19)	ERP (*n* = 19)	Never (*n* = 19)	Routine (*n* = 19)	ERP (*n* = 19)
ADIS-IV	4.63_{a} (.76)	5.37_{b} (.83)	$4.95_{a, b}$ (.62)	---	---	---
VOCI-C*	28.26_{a} (8.75)	33.16_{a} (8.85)	34.21_{a} (6.93)	24.00_{a} (6.68)	$31.11_{b, c}$ (9.29)	31.84_{c} (7.40)
BAT*	13.21_{a} (5.95)	7.63_{b} (6.01)	$10.58_{a, b}$ (6.92)	15.68_{a} (4.44)	9.79_{a} (6.80)	13.89_{a} (5.73)
A. SUDS*	31.53_{a} (24.89)	$52.95_{a, b}$ (30.52)	54.21_{b} (27.15)	20.26_{a} (21.24)	40.00_{a} (31.05)	42.89_{a} (25.66)
P. SUDS*	59.05_{a} (20.96)	$72.47_{a, b}$ (20.55)	75.00_{b} (16.83)	32.00_{a} (26.16)	58.95_{b} (28.31)	$55.00_{a, b}$ (24.15)

Note. ADIS-IV = Severity of Obsessive-Compulsive Disorder as measured by the Anxiety Disorders Interview Schedule for DSM-IV. Comorbid = Number of comorbid diagnoses. VOCI-C = Vancouver Obsessional Compulsive Inventory – contamination subscale. BAT = Behavioral approach test. SUDS = Subjective Units of Distress Scale. ERP = Exposure and response prevention. Post-exposure means are corrected for the corresponding pre-exposure variable. Means with unshared subscripts in each row at a given time point are significantly different from each other at that time point, $p < .05$.

Asterisks denote significant main effects of time on a given variable, $*p < .001$.

Exposure Outcome (Hypothesis 1a and 1b)

Within-participants effects. A series of 3 x 2 (condition x time) mixed ANOVAs revealed significant main effects of time on all measures, including VOCI-Contamination, $F(1, 54) = 13.89$, $p < .001$, $\eta_p^2 = .21$, BAT, $F(1, 54) = 20.05$, $p < .001$, $\eta_p^2 = .27$, and SUDS [Anticipatory, $F(1, 54) = 12.49$, $p = .001$, $\eta_p^2 = .19$; Peak, $F(1, 54) = 45.57$, $p < .001$, $\eta_p^2 = .45$; see Table 1] such that in general, contamination-related symptomatology and behavior significantly improved following the session.

Between-participants effects. Due to baseline differences in symptom severity (see above), the following analyses were conducted while controlling for the corresponding pre-exposure variable. One-way ANCOVA on post-exposure VOCI-Contamination scores while controlling for pre-exposure VOCI-Contamination revealed a trend for a main effect of condition, $F(2, 53) = 2.73$, $p = .075$, $\eta_p^2 = .09$. Similarly, one-way ANCOVA on post-exposure Peak SUDS while controlling for pre-exposure Peak SUDS revealed a trend for a main effect of condition, $F(2, 53) = 2.64$, $p = .081$, $\eta_p^2 = .09$. There were no condition differences on post-exposure Anticipatory SUDS or post-exposure BAT (both Fs < 1.80, both ps > .05, both η_p^2s < .07) while controlling for pre-exposure values.

Follow-up pairwise comparisons on post-exposure VOCI-Contamination scores revealed a significant difference between NU ($M = 24.00$, $SD = 6.68$) and RU [$M = 31.11$, $SD = 9.29$; $F(1, 35) = 4.91$, $p = .033$, $\eta_p^2 = .12$], and between NU and ERP [$M = 31.84$, $SD = 7.40$; $F(1, 35) = 4.56$, $p = .040$, $\eta_p^2 = .12$], but no difference between RU and ERP, $F(1, 35) = .18$, $p = .672$, $\eta_p^2 = .01$. On post-exposure Peak SUDS, there was a significant difference between NU ($M = 32.00$, $SD = 26.16$) and RU [$M = 58.95$, $SD = 28.31$; $F(1, 35) = 4.72$, $p = .037$, $\eta_p^2 = .12$], but no differences between NU and ERP [$M = 55.00$, $SD = 24.15$; $F(1, 35) = 2.55$, $p = .120$, $\eta_p^2 = .07$] or between RU and ERP, $F(1, 35) = .68$, $p = .416$, $\eta_p^2 = .02$. See Table 1 for means and standard deviations of all symptom measures at post-exposure, corrected for pre-exposure scores[1].

Treatment Acceptability (Hypothesis 2)

A one-way ANOVA revealed a marginal condition difference in TAAS scores, $F(2, 54) = 2.70$, $p = .076$, $\eta_p^2 = .09$. Pairwise comparisons showed marginally higher TAAS scores for the NU condition ($M = 53.26$, $SD = 8.32$) as compared to the RU condition [$M = 48.32$, $SD = 6.77$; $F(1, 36) = 4.04$, $p = .052$, $\eta_p^2 = .10$], marginally higher TAAS scores for the NU condition as compared to ERP [$M = 46.79$, $SD = 11.27$; $F(1, 36) = 4.06$, $p = .052$, $\eta_p^2 = .10$], and no difference between RU and ERP, $F(1, 36) = .26$, $p = .616$, $\eta_p^2 = .01$.

Discussion

The purpose of this study was to examine the impact of routinely-used versus never-used safety aids on a single session of exposure to contamination. Participants with OCD and

[1] These analyses were repeated without the covariates as a series of 3 x 2 (condition x time) mixed ANOVAs. These analyses revealed significant main effects of condition on BAT, $F(2, 54) = 5.07$, $p = .010$, $\eta_p^2 = .16$, Anticipatory SUDS, $F(2, 54) = 5.26$, $p = .008$, $\eta_p^2 = .16$, Peak SUDS, $F(2, 54) = 6.11$, $p = .004$, $\eta_p^2 = .18$, and VOCI-Contamination, $F(2, 54) = 4.84$, $p = .012$, $\eta_p^2 = .15$. There were no significant interactions.

contamination fear were randomized to receive an exposure session with no safety aid (ERP), a never-used safety aid (NU), or a routinely-used safety aid (RU). To the best of our knowledge, this is the first study to investigate the efficacy of ESB among clinically-anxious individuals with a diagnosis of (contamination-related) OCD. Consistent with hypotheses, all groups demonstrated improvement in terms of contamination fear severity, behavioral approach to the contaminant, and subjective anxiety ratings. However, participants in the NU condition had the lowest self-reported contamination fear severity at post-exposure, as well as significantly lower peak fear ratings than participants in the RU condition. NU also received marginally higher treatment acceptability and anticipated adherence ratings than RU and ERP. Overall, the findings suggest that there may be subtle yet potentially important differences in outcome and acceptability when incorporating different kinds of safety aids into exposure-based treatments. However, these results should be interpreted with caution due to baseline differences in symptom severity.

It was hypothesized that exposure would be effective in reducing contamination fear severity across conditions. This hypothesis was supported, as all conditions demonstrated improvement on measures of contamination fear severity, behavioral approach to the contaminant, and subjective anxiety ratings. It was further hypothesized that the RU condition would demonstrate poorer exposure outcome as compared to the NU and ERP conditions. This hypothesis was partially supported. Controlling for baseline differences in contamination fear severity, participants in the RU condition demonstrated greater contamination fear severity and peak fear at post-exposure than those in the NU condition. Consistent with hypotheses, these results suggest that a single session of exposure with routinely-used safety aids may be less effective than exposure with novel (i.e., never used) safety aids. Poorer exposure outcome in RU as compared to NU may be explained by the frequency with which routinely-used safety aids are employed in threatening situations. Indeed, repetitive use of these safety aids may lead the individual to falsely conclude that the safety aids themselves prevented a feared outcome from occurring, thus blocking the acquisition of *accurate* threat-relevant information. By contrast, novel safety aids, which have never been employed in threatening situations to manage anxiety and/or prevent feared outcomes, may not have the same potential to prevent disconfirmatory experiences. On the other hand, RU was comparable to NU on other measures of symptom severity at post-exposure, including anticipatory fear ratings and behavioral approach to the

contaminant. As such, it is unclear whether routinely-used safety aids actually interfere with the efficacy of a single session of exposure. These findings contrast with cognitive-behavioral theory on safety behavior, which suggests that *any* safety aid (novel and routinely-used alike) that is employed in feared situations in order to reduce anxiety and/or prevent feared outcomes will undermine cognitive change and treatment efficacy (e.g., Salkovskis et al., 1996). Future research is needed to clarify inconsistent findings regarding the impact of routinely-used safety aids in this study, particularly in the absence of baseline differences.

Contrary to hypotheses, RU was generally comparable to ERP at post-exposure, although the results should be interpreted with caution given the observed baseline differences. Indeed, participants in the RU condition demonstrated similar contamination fear severity, subjective fear ratings, and behavioral approach to the contaminant at post-exposure than participants in ERP. This is a surprising and noteworthy finding, as cognitive-behavioral theory suggests that safety behavior maintains anxiety via misattributions of safety in anxiety-provoking situations. In particular, safety aids which are employed in order to avoid imagined catastrophes (e.g., illness, disease) will prevent cognitive change (Salkovskis, 1991; Salkovskis et al., 1996). Based on our results, routinely-used safety aids may not necessarily undermine the efficacy of traditional exposure, at least in a single-session intervention. Although unexpected, these findings are consistent with previous research comparing traditional exposure and ESB and finding no differences (e.g., Hood et al., 2010; van den Hout et al., 2011; Milosevic & Radomsky, 2008). A closer look at cognitive-behavioral theory on safety behavior may explain these results. Rachman et al. (2008) proposed that any safety behavior, when used strategically in treatment, may enhance treatment efficacy and acceptability by providing an increased sense of control over the exposure session. In fact, the authors specified that "the prospect of using *their own* [emphasis added] or the therapist's recommended safety tactics can help to provide that sense of control and increased predictability" (p. 541). As such, participants in the RU condition may have felt increased control when using their safety aids during the exposure session, which may have contributed to the efficacy of the intervention.

Alternatively, inhibitory learning theory may explain these findings. As described by Craske et al. (2014), the degree to which safety behavior interferes with inhibitory learning (i.e., the development of new non-threat associations; Craske et al., 2008) depends on the strength of the safety behavior in reducing anxiety as well as the strength of the feared stimulus in provoking

anxiety. As such, it could be that RU was effective because the exposure session was still potent enough to elicit the fear response, and thus, make it possible for corrective learning to occur. Of course, to our knowledge this is the first study to examine the impact of routinely-used safety aids on the efficacy of exposure, and thus further replication and extension of our findings, especially over a longer course of intervention and follow-up, will be important. The degree to which safety behavior enhances perceived control and/or inhibitory learning was not assessed in the current study, and baseline differences may have impacted the results.

Contrary to cognitive-behavioral theory (e.g., Salkovskis et al., 1996) and some experimental research (e.g., McManus et al., 2008; Powers et al., 2004), NU was generally comparable to ERP at post-exposure. Specifically, participants in the NU condition had significantly lower VOCI-Contamination scores following the exposure session than participants in the ERP group, and comparable scores on all other outcome measures (i.e., subjective fear, behavioral approach). Overall, these findings suggest that exposure with safety behavior may be comparably effective to traditional exposure. These results are consistent with cognitive-behavioral theory on the potential benefits of using safety behavior in CBT (Parrish et al., 2008; Rachman et al., 2008), as well as recent research demonstrating comparable outcomes in traditional exposure as compared to ESB (e.g., Hood et al., 2010; Rachman et al., 2011; Sy et al., 2011). Taken together, these studies support the notion that safety behavior is not *necessarily* detrimental to treatment, and may be facilitative in certain cases (e.g., in reducing self-reported contamination fear severity, as in the current research). The current study has the potential to contribute to previous work by aiming to determine which safety aids may be beneficial versus detrimental to exposure. Indeed, to our knowledge only one previous study has attempted to distinguish between different types of safety aids and their impact on treatment outcome (see Goetz & Lee, 2015). Based on the results of the current study, novel safety aids may be most appropriate for use in exposure, although mixed findings regarding the impact of routinely-used safety aids preclude any substantive conclusions. Replication and extension of the findings over a longer period of intervention and follow-up is needed to clarify these results. Furthermore, it should be noted that although we were interested in the *novelty* of the safety behavior in this study (i.e., the frequency with which it was previously used by participants), rather than the specific function or type of safety behavior, it is possible that the use of different kinds of safety aids may have impacted our findings. Indeed, most participants in the RU group brought in and

used hand sanitizer during the exposure session, while the majority of participants in NU were given latex-free gloves for the exposure. To use the terminology of Goetz and Lee (2015), most individuals in the RU group employed "restorative" safety aids during exposure, whereas most of those in NU were given "preventive" safety aids. Given that these authors found differences in exposure outcome as a function of "restorative" versus "preventive" safety aids, it will be important to extend the current study by controlling for this potential confound (e.g., by matching safety aids across conditions), although this may be challenging due to the idiosyncratic nature of safety behavior (Salkovskis et al., 1996). Our prediction would be that although "restorative" safety aids might be more helpful than "preventative" safety aids, both types could be useful in facilitating disconfirmatory experiences, depending upon the beliefs held by each individual participant/client.

It was hypothesized that the safety behavior conditions would be rated as more acceptable than ERP. This hypothesis was partially supported, as anticipated adherence ratings were marginally higher in the NU condition as compared to ERP. These findings are in partial support of Rachman et al. (2008), who proposed that safety behavior may enhance the acceptability of exposure-based treatments, as well as recent research demonstrating that CBT with safety behavior is rated as more acceptable than traditional CBT (Levy & Radomky, 2014; Levy et al., 2014; Milosevic & Radomsky, 2013b). Taken together, these results indicate that safety behavior may enhance the acceptability of CBT, at least in a brief intervention. Although we did not find significant differences in treatment acceptability between NU and ERP, the pattern of exclusions in the current study may lend additional support to our hypotheses. Indeed, the only participant who refused to complete the exposure session was assigned to the ERP condition, suggesting that perhaps this individual found the exposure session particularly distressing and intolerable. By contrast, the participant who was excluded from the NU condition elected not to use the assigned safety aid, but otherwise completed the exposure session without complaint. Nevertheless, further replication and extension of these findings will be critical, as a single-session exposure does not provide adequate information about the acceptability of a complete CBT protocol. Furthermore, it will be interesting to examine the impact of prior pharmacotherapy and psychotherapy (particularly CBT) on perceptions of treatment acceptability, which was not assessed in the current study. Our previous work (Levy et al., 2014) suggests that previous treatment (both medication-based and psychological) may

actually reduce treatment acceptability and anticipated adherence, and so it will be important to further investigate these associations.

The current study had several limitations. First, given our sample size, we may have been underpowered to detect condition differences in outcome and acceptability, although an *a priori* power analysis suggested that a sample size of 57 was sufficient to test our hypotheses. Indeed, it should be noted that the results of our omnibus tests were only marginally significant, although follow-up pairwise comparisons revealed significant differences on certain outcome measures. We were also unable to compare the conditions on other potentially important outcome variables, such as disgust (e.g., Olatunji, Sawchuk, Lohr, & de Jong, 2004) and mental (non contact-based) contamination (e.g., Rachman, 2004; Rachman, Coughtrey, Shafran & Radomsky, 2015). Furthermore, baseline differences on most measures of symptom severity may have impacted our findings, although we attempted to control for these differences in all between-groups analyses. As such, replication and extension of this work will be important, particularly in the absence of baseline differences. Second, the single-session delivery of exposure in this study is inadequate to assess definitively treatment outcome and/or perceptions of acceptability. Similarly, in clinical practice CBT therapists commonly provide lengthy rationales for exposure therapy and safety behavior elimination, which could not be provided in a brief experiment such as this one. Although it will be significantly more resource intensive, future research should investigate the efficacy and acceptability of a comprehensive CBT protocol (including an adequate treatment rationale) varying in safety aids. A related limitation is the absence of a follow-up period, which did not allow us to assess maintenance of gains. Although previous studies comparing exposure with and without safety behavior have not found differences in outcome after a follow-up period (e.g., van den Hout et al., 2011), we cannot assume that our results would have demonstrated stability over time. Third, we did not assess the impact of covert (subtle) safety behaviors on exposure outcome, and it is possible that the use of these behaviors impacted our findings. Finally, the *judicious* use of safety behavior involves the incorporation of safety aids into the early and/or more challenging stages of treatment and then fading them out over the course of treatment (Rachman et al., 2008). Given that the current study used a single-session design, we were unable to assess the efficacy and acceptability of exposure with safety behavior fading. Despite these limitations, to our knowledge this is the first study to assess the effect of safety behavior on the efficacy of exposure among clinically-anxious

individuals diagnosed with OCD. Consistent with previous work, our findings suggest that safety behavior may not interfere with a single-session exposure, and certain safety aids (i.e., those which are novel) may enhance exposure efficacy and acceptability.

Chapter 3:
BRIDGE

Contrary to traditional cognitive-behavioural theory pertaining to safety behaviour (Salkovkis, 1991; Salkovskis et al., 1996), experimental research examining the impact of safety behaviour on treatment outcome is inconclusive. Some studies suggest that safety behaviour undermines the efficacy of exposure-based treatments (e.g., Kim, 2005; Salkovskis et al., 1999), whereas other research has failed to find a deleterious effect of safety behaviour on treatment outcome (e.g., Milosevic & Radomsky, 2008, 2013b; Rachman et al., 2011). Furthermore, emerging research indicates that safety behaviour may actually improve outcomes in CBT by enhancing treatment acceptability (e.g., Levy & Radomsky, 2014) and cognitive change (e.g., Milosevic & Radomsky, 2013b). However, further research on safety behaviour in CBT is hampered by the absence of practical guidelines for the incorporation of safety behaviour into existing treatments. For instance, which kinds of safety behaviour should be used in treatment? Are there certain safety aids that are more likely to undermine the efficacy of exposure than others?

Study 1 was designed to inform our understanding of which kinds of safety aids should be considered during exposure for anxiety-related problems. Based on cognitive-behavioural theory (e.g., Salkovskis, 1991; Salkovskis et al., 1996), it follows that routinely-used safety aids may be likely to undermine the efficacy of exposure, as their continued use may have established an incorrect association between the presence of the safety aid and the non-occurrence of negative outcomes. By contrast, a novel safety aid, which has never been employed in a threatening situation to prevent or avoid feared outcomes, may not have the same potential to prevent disconfirmatory experiences. To test this hypothesis, clinical participants with contamination-related OCD were randomized to complete an exposure session with no safety aid (ERP), a routinely-used safety aid (RU), or a never-used safety aid (NU). Results demonstrated significant pre- to post-exposure reductions in contamination fear severity across conditions. However, participants in the NU condition demonstrated the lowest self-reported contamination fear severity at post-treatment, and the NU condition received the highest acceptability and anticipated adherence ratings. Contrary to traditional cognitive-behavioural theory (Salkovskis, 1991; Salkovskis et al., 1996) but consistent with recent literature (e.g., Rachman et al., 2011), safety behaviour did not undermine the efficacy of exposure in this study. Overall, these

findings suggest that novel safety aids may be the most appropriate choice for use in exposure-based treatment.

In addition to which kinds of safety behaviour to use, other practical questions concerning the use and fading of safety behaviour remain. For example, who should decide when to eliminate the safety behaviour during treatment, the client or the therapist? According to Rachman et al. (2008), the judicious use of safety behaviour is the careful and strategic implementation of safety behaviour, "with an emphasis on the early stages of treatment" (p. 169). Despite the fact that this definition of "judicious use" implies that safety behaviour is used in the beginning of treatment and then removed, specific guidelines for how to eliminate the safety behaviour are not provided. Of course, these guidelines, ideally stemming from an evidence base, are needed in order to inform clinical practice and future research on safety behaviour. As such, Study 2 was designed to address this next question concerning the practice of safety behaviour fading. Participants with subclinical levels of contamination fear were assigned to complete an exposure session under one of three fading conditions: 1) participant-initiated (PI condition); 2) experimenter-initiated, which was yoked to the PI condition in order to control for time (ET condition); and 3) experimenter-initiated, which was based on decreasing subjective distress ratings (ED condition). According to self-efficacy theory (Bandura, 1977, 1988), activities which promote a sense of confidence and control in threatening situations will reduce fear and avoidance behaviour. As such, perhaps allowing participants to decide when to eliminate the safety behaviour may promote perceptions of self-efficacy and control, thus increasing treatment efficacy and acceptability. From self-efficacy theory, it was hypothesized that the PI condition would demonstrate superior treatment outcome and greater treatment acceptability as compared to both the ET and the ED conditions.

CHAPTER 4:
IT'S THE WHO NOT THE WHEN: AN INVESTIGATION OF SAFETY BEHAVIOR FADING IN EXPOSURE TO CONTAMINATION

Obsessive-compulsive disorder (OCD) is a common and often severe psychological disorder, which affects 1-2% of the population (Kessler et al., 2005). Cognitive-behavioral therapy (CBT) that incorporates exposure and response prevention (ERP) is an effective treatment for OCD (e.g., Deacon & Abramowitz, 2004; Foa et al., 2005; Franklin & Foa, 1998, 2011), which involves repeated and prolonged exposure to feared stimuli while refraining from engaging in compulsive behavior. Despite the fact that ERP is considered by some to be the "gold standard" treatment for OCD (March, Frances, Carpenter, & Kahn, 1997), an unacceptably high number of treatment-seeking individuals refuse this treatment entirely or drop out prematurely (Cottraux et al., 2001; Foa et al., 2005; Stanley & Turner, 1995; Whittal, Thordarson, & McLean, 2005). For example, in a randomized-controlled trial comparing the efficacy of clomipramine and ERP, Foa et al. (2005) reported that 22% of participants withdrew from the study upon randomization into the ERP condition, and an additional 28% dropped out during ERP. Moreover, 23% of participants in this study withdrew upon randomization into clomipramine, and an additional 25% dropped out during clomipramine treatment. In another study comparing the efficacy of ERP and cognitive therapy for OCD, Cottraux et al. (2001) reported that 30% of participants dropped out of the ERP condition, as compared to 22% who dropped out of cognitive therapy. Taken together, these studies suggest that ERP has relatively similar dropout rates to other effective treatments. Nevertheless, these rates represent a significant dissemination and utilization problem, and suggest that a large number of OCD sufferers are not receiving effective treatment for their OCD.

As such, recent literature has focused on potential ways in which to increase the acceptability of ERP without detracting from its efficacy. Rachman, Radomsky, and Shafran (2008) proposed that the judicious use of safety behavior, defined as the careful and strategic incorporation of safety behavior into the early and/or more challenging stages of treatment, may enhance the acceptability of CBT. However, exactly *how* to fade safety behavior during treatment is unclear from this definition of "judicious use". The current study aimed to address this question by examining the efficacy and acceptability of participant- and experimenter-initiated fading of safety behavior during exposure for contamination fear. Of course, before

credible research on safety behavior in CBT can be conducted, it will be important to operationalize and define the practice of safety behavior fading.

Safety behavior has been defined as overt or covert avoidance strategies that are employed in anxiety-provoking situations to reduce anxiety and/or minimize perceived threat (Salkovskis, 1991; Salkovskis, Clark, & Gelder, 1996). According to most cognitive-behavioral models of anxiety disorders, safety behavior prevents the acquisition of accurate threat-relevant information via a misattribution of safety in threatening situations (Salkovskis, 1991). Due to this proposed misattribution, anxious individuals fail to disconfirm the likelihood and/or relative dangerousness of their feared outcome(s). From this theory, it follows that safety behavior may undermine the efficacy of exposure therapy, as clients/patients who employ safety behavior during treatment may erroneously attribute the success of the exposure and/or the non-occurrence of feared outcomes to the safety behavior. Indeed, several studies have shown that safety behavior interferes with the efficacy of exposure, such that participants who used safety behavior during exposure demonstrated poorer outcomes in terms of fear reduction and cognitive change than participants who did not use safety behavior (Kim, 2005; McManus, Sacadura, & Clark, 2008; Salkovskis, Clark, Hackmann, Wells, & Gelder, 1999; Sloan & Telch, 2002; Taylor & Alden, 2010). In fact, the mere availability of safety behavior has been shown to undermine the efficacy of exposure (Powers, Smits, & Telch, 2004), although an independent team of investigators failed to replicate this effect (Sy, Dixon, Lickel, Nelson, & Deacon, 2011). Taken together, these findings suggest that safety behavior is detrimental to treatment outcome. As such, many cognitive-behavioral treatment manuals and books advise against the use of safety behavior in treatment, or recommend that it be eliminated as soon as possible (e.g., Abramowitz, Deacon, & Whiteside, 2011; Foa, Yadin, & Lichner, 2012).

In contrast to these results, a growing body of literature suggests that safety behavior may not necessarily undermine the efficacy of CBT. These studies have generally shown that participants who employed safety behavior during exposure demonstrated comparable outcomes as compared participants who did not use safety behavior (Goetz & Lee, 2015; Hood, Antony, Koerner, & Monson, 2010; van den Hout, Engelhard, Toffolo, & van Uijen, 2011; Sy et al., 2011; Rachman, Shafran, Radomsky, & Zysk, 2011; Milosevic & Radomsky, 2008, 2013a). In fact, some research has found more favorable outcomes in exposure with safety behavior (ESB), such that participants receiving ESB demonstrated *greater* cognitive change, *closer* approach to

feared stimuli, and/or *lower* distress ratings than participants receiving traditional exposure (e.g., Milosevic & Radomsky, 2008, 2013a). The findings from these studies are in direct opposition to cognitive-behavioral theory (Salkovskis, 1991; Salkovkis et al., 1996), and instead support the notion that safety behavior is not *necessarily* deleterious to treatment, and may be beneficial in certain cases (Parrish, Radomsky, & Dugas, 2008; Rachman et al., 2008).

According to Rachman et al. (2008), the potential benefits of using safety behavior in CBT may be explained by cognitive theory. The authors posited that safety behavior may facilitate disconfirmatory experiences and increase perceptions of self-efficacy and control during treatment. Self-efficacy is "the conviction that one can successfully execute the behavior required to produce [certain] outcomes" (Bandura, 1977, p. 193). In other words, self-efficacy is an individual's perceived sense of mastery, competence, and confidence in a given situation. If self-efficacy beliefs are low, individuals will believe they cannot manage or cope with the situation, and thus will become distressed and/or engage in avoidance behavior. According to self-efficacy theory (Bandura, 1977, 1988), activities which diminish anxiety and promote a sense of mastery and control in threatening situations will reduce fear. As such, it could be that safety behavior may enhance therapeutic success by reducing anxiety and promoting a sense of confidence during exposure, which may in turn facilitate the acquisition of disconfirmatory information. Indeed, Bandura's early work demonstrated that providing anxious individuals with "response induction aids" (e.g., protective gloves) during exposure to a feared stimulus resulted in superior treatment outcome as compared to when such aids were withheld (Bandura, Jeffery, & Wright, 1974). In light of these findings, Rachman et al. (2008) suggested that safety behavior may enhance the efficacy and acceptability of exposure-based treatments via increases in self-efficacy beliefs. If clients/patients are provided with safety behavior during the more challenging stages of treatment until they feel ready to eliminate it, perhaps they will feel more confident and in-control as treatment progresses.

Consistent with Rachman et al. (2008), recent research has shown that CBT with safety behavior is rated as more acceptable than traditional CBT (Levy & Radomsky, 2014; Levy, Senn, & Radomsky, 2014; Milosevic & Radomsky, 2013b). However, another study failed to find differences in acceptability between traditional exposure and ESB (Deacon, Sy, Lickel, & Nelson, 2010). As such, more research is needed to clarify the acceptability-enhancing potential of safety behavior in exposure-based treatments. Beyond acceptability, there may be additional

benefits to using safety behavior in CBT. For example, Milosevic and Radomsky (2013a) reported that participants receiving ESB for spider fear demonstrated greater reductions in targeted threat beliefs about spiders than participants receiving traditional exposure. Consistent with these results, Goetz and Lee (2015) recently found that exposure with "restorative" safety behavior (i.e., safety behavior that is employed in order to restore safety after confrontation with a perceived threat) resulted in greater and more rapid decreases in contamination fear as compared to exposure without safety behavior. While preliminary, these findings support the potential advantages of safety behaviour in CBT, particularly with regard to treatment acceptability, cognitive change, and fear reduction.

Taken together, current literature suggests that safety behavior may not always be detrimental to CBT, and may even be facilitative in some situations. Unfortunately, to our knowledge there are currently no published recommendations for the judicious use of safety behavior in CBT, and many aspects of how safety behavior should be employed require clarification. For instance, who should decide when to fade out the safety behavior during treatment, the client/patient or the therapist? The current study aimed to address this question by comparing the efficacy and acceptability of participant- and experimenter-initiated fading of safety behavior during exposure to contamination. In the participant-initiated ("PI") condition, the participant elected when to eliminate the safety behavior, while in the experimenter-initiated conditions, the experimenter indicated when to drop the safety behavior. There were two experimenter-initiated fading conditions: one in which the time/trial number of safety behavior fading was yoked to the PI condition (i.e., to control for time, the experimenter-initiated time or "ET" condition), and the other which was based on decreasing subjective fear ratings (i.e., to simulate a more traditional exposure session, the experimenter-initiated distress or "ED" condition). Because the primary aim of this study was to determine *who* should decide to fade the safety behavior, we felt it was important to control for *when* the safety behavior was faded; as such, the ET condition is a design-driven control condition. The ED condition was included in order to maximize ecological validity, as we acknowledge that while the ET condition is more methodologically rigorous, it may be less representative of standard clinical practice.

Consistent with self-efficacy theory (Bandura, 1977, 1988), it was hypothesized that the PI condition would demonstrate superior treatment outcome and greater self-efficacy as compared to both the ET condition (Hypothesis 1a) and the ED condition (Hypothesis 1b). This

is because in the PI condition, participants *elected* when to eliminate the safety aid, thus promoting their perceptions of self-efficacy and control in a threatening situation. Based on Rachman et al. (2008), it was further hypothesized that the PI condition would be rated as more acceptable than both ET (Hypothesis 2a) and ED (Hypothesis 2b).

2. Method

2.1. Participants

Participants were 100 undergraduate students from Concordia University with subclinical levels of contamination fear who were recruited via an online participant pool website and flyers posted around campus. Level of contamination fear was assessed using the contamination subscale of the Vancouver Obsessional Compulsive Inventory ("VOCI-Contamination"; Radomsky et al., 2006; Thordarson et al., 2004), which was administered as a study eligibility screener via the online participant pool website. Those who scored a 12 or higher on the VOCI-Contamination were invited to participate in the study. A score of 12 is one standard deviation higher than the mean of the undergraduate sample used to validate the VOCI (see Radomsky et al., 2006). The majority of participants was female (n = 90, 90.0%), with an average age of 23.5 (SD = 6.3) years. Most participants identified their ethnic background as Caucasian (n = 52, 52.0%), with the rest identifying as Arab/West Asian (n = 10, 10.0%), South Asian (n = 8, 8.0%), Other (n = 8, 8.0%), Black (n = 6, 6.0%), Chinese (n = 6, 6.0%), Latin-American (n = 5, 5.0%), Filipino (n = 3, 3.0%), and Korean (n = 2, 2.0%). Participants received course credit or entry into a cash draw for their participation.

2.2. Measures

2.2.1. Behavioral approach test (BAT). The BAT is a behavioral measure of fear. In the current study, it consisted of participants approaching a contaminant (a "dirty" bedpan; see Materials) as close as they were able on a 24-point hierarchy, ranging from standing outside the testing room containing the bedpan to touching directly above the bedpan liquid with both hands and then touching their lips with both hands. This BAT has been adapted from previous research on contamination fear (Cougle, Wolitzy-Taylor, Lee, & Telch, 2007; Levy & Radomsky, 2014; Najmi, Tobin, & Amir, 2012). Participants completed the BAT with an independent evaluator who was blind to condition assignment, and the number of steps completed served as the measure of behavioral approach in this study.

2.2.2. Credibility/Expectancy Questionnaire (CEQ). The CEQ (Devilly & Borkovec, 2000) is a 6-item questionnaire that assesses perceived credibility and expectancy of a given treatment. Items are rated on a 9-point Likert scale (1 = *not at all useful/logical* and 9 = *very useful/logical*) or on an 11-point percentage scale (0% - 100% *improvement in symptoms*). For scoring ease, the CEQ was modified to utilize only the 9-point Likert scale (G. Devilly, personal communication, February 5, 2013). The authors reported a 2-factor solution for the CEQ, the first being treatment credibility and the second treatment expectancy. The CEQ has demonstrated adequate internal consistency and retest reliability (Devilly & Borkovec, 2000), and both subscales demonstrated good internal consistency in the current study (all αs > .88).

2.2.3. Endorsement and Discomfort Scale (EDS). The EDS (Tarrier, Liversidge, & Gregg, 2006) is a 10-item questionnaire that assesses perceptions of treatment acceptability. Participants are asked to rate their agreement with a number of statements about a given treatment on a 9-point Likert scale (1 = *disagree strongly* and 9 = *agree strongly*). The authors reported a 2-factor structure for the EDS, the first factor being treatment endorsement and the second factor treatment discomfort. In the current study, the EDS was administered following completion of the exposure session, and participants were asked to consider the acceptability of the session as if it were incorporated into a complete treatment protocol (i.e., several exposure sessions, instead of just one). The EDS demonstrated excellent internal consistency in the current study (α = .94).

2.2.4. Obsessive Beliefs Questionnaire-44 (OBQ-44). The OBQ-44 (Obsessive Compulsive Cognitions Working Group, 2005) is a 44-item questionnaire that assesses OCD-related beliefs (e.g., inflated responsibility, intolerance of uncertainty). Participants are asked to rate their agreement with each obsessive belief on a 7-point Likert scale (1 = *disagree very much* and 7 = *agree very much*). Higher scores on the OBQ-44 indicate greater endorsement of obsessive beliefs. The authors reported excellent internal consistency for the OBQ-44 in a clinical sample of individuals with OCD, and the measure demonstrated excellent internal consistency in the current study at pre- and post-treatment (both αs = .96).

2.2.5. Subjective Units of Distress Scale (SUDS). The SUDS (Wolpe, 1958) is a widely-used measure of subjective fear. Participants are asked to rate how fearful they feel on a scale from 0 (*neutral*) to 100 (*the worst distress you can imagine*). In the current study, the SUDS was administered at two time points during the BAT (i.e., prior to approaching the

contaminant, the Anticipatory SUDS rating, and upon reaching the last step in the BAT they could attain, the Peak SUDS rating), as well as after each exposure trial for the duration of the exposure session.

2.2.6. Self-efficacy. Participants rated their self-efficacy by answering the following question: "On a scale from 0 to 100, if 0 is not at all confident and 100 is completely confident, how confident are you that you could repeat the task you have just done?" Self-efficacy ratings were taken prior to each exposure trial for the duration of the exposure session. However, only the rating following the removal of safety behavior (i.e., the first trial in which participants did not use safety behavior) was compared between groups. This is because we expected that safety behavior would change as a function of safety behavior fading, particularly for individuals in the PI group who elected when to eliminate their safety aid.

2.2.7. Vancouver Obsessional Compulsive Inventory (VOCI). The VOCI (Radomsky et al., 2006; Thordarson et al., 2004) is a 55-item questionnaire that assesses a range of OCD symptoms, including contamination fear and compulsive washing. Participants are asked to rate the degree to which the items are true of them on a 5-point Likert scale (0 = *not at all* and 4 = *very much*). The VOCI has shown excellent internal consistency in both student and clinical samples (all αs > .93), as well as convergent and divergent validity (Radomsky et al., 2006; Thordarson et al., 2004). For the purposes of the current study, only the VOCI-Contamination was administered, and it demonstrated good internal consistency at pre- (α = .87) and post-treatment (α = .88).

2.3. Materials

2.3.1. Contaminants. Before the exposure session, participants were presented with six contaminants, including rubbing the bottom of their shoes; handling old and worn Canadian currency; rummaging through a partly-filled garbage basket; handling an old telephone; handling a sealed biohazard bag containing a test tube labelled "PATH 194"; and handling a sealed biohazard bag containing discarded laboratory materials (e.g., a urine cup). These contaminants have been used in previous research on exposure-based treatment for contamination fear (van den Hout et al., 2011; Rachman et al., 2011). Participants were asked to touch the six contaminants in random order and to rate their SUDS while touching each item. The object that evoked the highest SUDS rating was used in the exposure session.

2.3.2. Safety aids. Participants were presented with a variety of safety aids, including hand sanitizer, latex-free gloves, hygienic wipes, face masks, and a protective apron, and were asked to choose one safety aid to use during the exposure session.

2.3.3. "Dirty" bedpan. A bedpan containing a mixture of water and yellow food coloring was used as the contaminant for the BATs. A similar object has been used in previous research on contamination fear (Levy & Radomsky, 2014; Olatunji, Lohr, Sawchuck, & Tolin, 2007).

2.4. Treatment Conditions

2.4.1. Condition assignment. Participants were assigned to complete the exposure session under one of three fading conditions: PI, ET, or ED. To control for time, the trial number at which participants were asked to fade their safety behavior in the ET condition was yoked to those of participants in the PI condition. For example, if a participant in the PI condition elected to eliminate the safety aid during the 14th exposure trial, then a participant in the ET condition was asked to drop the safety aid during the 14th exposure trial. In order to ensure the success of the yoking procedure, participants could not be randomly assigned to condition. This is because one participant had to be assigned to the ET condition following a participant that had completed the PI condition, as the participant in the PI condition determined the trial at which the participant in the ET condition would be asked to drop the safety aid. As such, participants were assigned to condition consecutively in blocks of three in the following order: 1) PI, 2) ET, and 3) ED, for the duration of the study.

2.4.2. Condition rationale. Prior to the exposure session, participants were provided with a brief rationale for exposure therapy, and were then asked to choose a safety aid for the exposure session. To avoid implying the absolute necessity of the safety aid, the selection of safety aids was presented as follows: "To assist you with facing your fear, you can choose one item from this selection that might be helpful to you during the exposure session. However, as you advance through the session, we will phase out this safety aid and continue to confront the contaminant without it. This is because in treatment, the eventual goal is to face your fears without any assistance". If this was the PI condition, the rationale continued as follows: "You have been assigned to the condition where you will decide when to eliminate the safety aid. There will be 20 total trials of exposure to this [chosen contaminant], and you will be asked to drop the safety aid as soon as you feel ready to do so". If this was the ET condition, the rationale

continued as, “You have been assigned to the condition where I will decide when to eliminate the safety aid. There will be 20 total trials of exposure to this [chosen contaminant], and at some point in time I will ask you to drop the safety aid”. If this was the ED condition, the exposure rationale continued as follows: “You have been assigned to the condition where I will decide when to eliminate the safety aid. There will be 20 total trials of exposure to this [chosen contaminant], and at some point I will ask you to drop the safety aid as your distress level comes down”. Participants in the ED condition were asked to drop the safety aid once their SUDS rating declined to 50% or less of their initial trial rating.

2.4.3. Exposure session. For all participants, the session consisted of 20 exposure trials to the target contaminant. Each trial consisted of touching the contaminant, then waiting for a 30-second delay prior to the next trial. This exposure protocol was modeled from previous work in the safety behavior literature (see van den Hout et al., 2011 and Rachman et al., 2011). Self-efficacy ratings were taken prior to each touch, whereas SUDS ratings were taken after each touch. In the first several trials, participants were permitted to use the safety aid. For the remainder of the trials, they did not use the safety aid (either the participant or the experimenter decided when to eliminate it, depending on the condition; see above).

2.5. Procedure

Potential participants completed the VOCI-Contamination, and those who scored a 12 or higher were invited to participate in the study. Following the informed consent process, participants completed a battery of self-report questionnaires including a demographics questionnaire and several measures of symptom severity (see Measures). Participants then completed the pre-treatment BAT with an independent evaluator who was blind to condition. Following the pre-treatment BAT, participants were assigned to condition and presented with the six contaminants (see Materials). Once the most distressing object was determined, participants were provided with the condition rationale, and asked to choose a safety aid for the session (see description above). Following the treatment rationale and selection of materials, participants completed the CEQ.

Participants then completed the exposure session (see description above). Following the session, participants completed the EDS and were then given a short break during which they were told to relax and read magazines. After the break, participants were asked to complete the same battery of symptom measures (see Measures) and then to complete the post-treatment BAT

with the independent evaluator who at this point was not blind to time, but remained blind to condition assignment. Participants were then fully debriefed and compensated for their participation.

3. Results

3.1. Exclusions

Ten participants were excluded for the following reasons: one reported SUDS ratings of 0 for all six contaminants; one refused to complete the exposure session; one participant assigned to the PI condition refused to drop the safety aid during the session; two participants misunderstood the experimenter's instructions and completed the questionnaires in the wrong order; two participants in the ED condition were mistakenly asked to drop the safety aid at the wrong time (e.g., prior to reaching a SUDS rating of 50% or less of their initial trial rating); and three participants in the ED condition never reached a SUDS rating of 50% or less of their first trial rating, and thus were never asked to drop the safety aid. These 10 participants were excluded from the analyses that follow, leaving a final sample of 90 participants.

3.2. Manipulation Check

In accordance with the yoking procedure, participants in the ET condition were asked to drop the safety aid at a predetermined time point, based on when participants in the PI condition had elected to eliminate their safety aid. An independent samples *t* test confirmed that the yoking procedure was successful, as there were no significant differences in the trial number at which participants in the PI ($M = 8.03$, $SD = 4.18$) and ET ($M = 8.06$, $SD = 4.18$) conditions eliminated the safety aid, $t(60) = -.03$, $p = .976$, $d = -.007$. However, there were significant differences between the PI ($M = 8.03$, $SD = 4.18$) and ED ($M = 5.46$, $SD = 4.17$) conditions in terms of the trial at which the safety aid was dropped, $t(57) = 2.36$, $p = .022$, $d = .62$.

3.3. Group Comparisons at Pre-Treatment

To assess baseline comparability of groups, a series of one-way analyses of variance (ANOVAs) were conducted on the demographic variables and on the following pre-treatment measures: VOCI-Contamination, OBQ, BAT, and SUDS ratings. Groups did not differ with respect to age [$F(2, 87) = .11$, $p = .893$, $\eta_p^2 = .003$], sex [$X^2(2) = .49$, $p = .783$], or any pre-treatment measure (all Fs < 1.92, all ps > .05, all η_p^2s < .04). However, there was a trend for baseline group differences on the BAT, $F(2, 87) = 3.04$, $p = .053$, $\eta_p^2 = .07$. See Table 2 for means and standard deviations of all symptom measures at pre- and post-exposure.

Table 2

Means and Standard Deviations of Symptom Measures

Measure	Pre-Treatment, *M*(*SD*)			Post-Treatment, *M(SD)*		
	PI (*n* = 31)	ET (*n* = 31)	ED (*n* = 28)	PI (*n* = 31)	ET (*n* = 31)	ED (*n* = 28)
VOCI-C	19.39 (8.33)	19.42 (10.47)	21.71 (8.57)	18.52 (8.38)	19.58 (10.68)	20.93 (8.80)
OBQ	160.94 (44.54)	163.23 (43.54)	164.29 (48.22)	151.71 (47.00)	161.87 (40.91)	152.43 (47.12)
BAT	13.65 (7.05)	9.77 (7.42)	9.36 (7.96)	15.42 (7.23)	14.03 (7.04)	14.14 (7.75)
A. SUDS	36.94 (23.51)	26.94 (26.57)	38.64 (25.31)	19.03 (21.77)	17.74 (19.95)	21.61 (21.17)
P. SUDS	57.35 (22.28)	53.48 (22.59)	58.68 (24.73)	35.16 (30.29)	44.84 (26.12)	41.61 (26.98)

Note. PI = Participant-initiated condition. ET = Experimenter-initiated time condition. ED = Experimenter-initiated distress condition. VOCI-C = Vancouver Obsessional Compulsive Inventory – Contamination Subscale. OBQ = Obsessive Beliefs Questionnaire. BAT = Behavioral approach test. A. SUDS = Anticipatory Subjective Units of Distress Scale ratings. P. SUDS = Peak Subjective Units of Distress Scale ratings.

3.4. Treatment Outcome (Hypothesis 1a and 1b)

3.4.1. Comparisons between PI and ET (Hypothesis 1a). To compare the efficacy of PI and ET, a series of 2 x 2 (condition x time) mixed ANOVAs were conducted on contamination fear severity scores, obsessive beliefs, and SUDS ratings at pre- and post-treatment. There were significant main effects of time on the OBQ, $F(1, 60) = 8.56$, $p = .005$, $\eta_p^2 = .13$, and SUDS [Anticipatory, $F(1, 60) = 21.51$, $p < .001$, $\eta_p^2 = .26$; Peak, $F(1, 60) = 27.98$, $p < .001$, $\eta_p^2 = .32$], indicating that obsessive beliefs and subjective fear decreased over time. There was no main effect of time on VOCI-Contamination, $F(1, 60) = .32$, $p = .574$, $\eta_p^2 = .01$, indicating that contamination fear severity remained relatively stable over time. Due to baseline differences on the BAT (see above), a one-way analysis of covariance (ANCOVA) was

conducted on this measure, controlling for pre-treatment BAT. There was no significant difference by condition on post-treatment BAT, $F(1, 59) = 2.42$, $p = .125$, $\eta_p^2 = .04$[2].

There were significant interactions between condition and time on the OBQ, $F(1, 60) = 4.74$, $p = .033$, $\eta_p^2 = .07$, and between condition and time on Peak SUDS ratings, $F(1, 60) = 5.40$, $p = .024$, $\eta_p^2 = .08$, such that participants in the PI condition demonstrated greater reductions in obsessive beliefs and peak fear from pre- to post-exposure. These interactions are displayed in Figures 1 and 2, respectively.

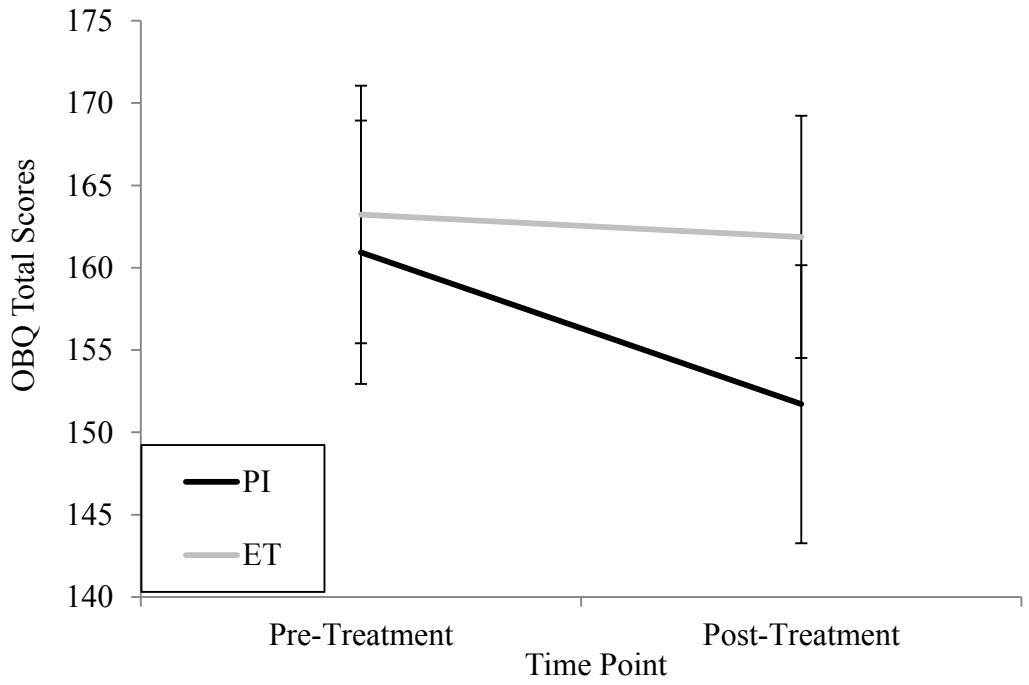

Figure 1. Mean scores on the Obsessive Beliefs Questionnaire-44. $N = 62$. OBQ = Obsessive Beliefs Questionnaire. PI = Participant-initiated condition. ET = Experimenter-initiated time condition. Error bars represent standard errors.

[2] This analysis was repeated without the pre-exposure BAT as the covariate as a 2 x 2 (condition x time) mixed ANOVA. This analysis revealed no main effect of condition and a significant interaction, $F(1, 60) = 3.72$, $p = .030$, $\eta_p^2 = .08$, such that the ET group demonstrated greater increases in BAT than PI.

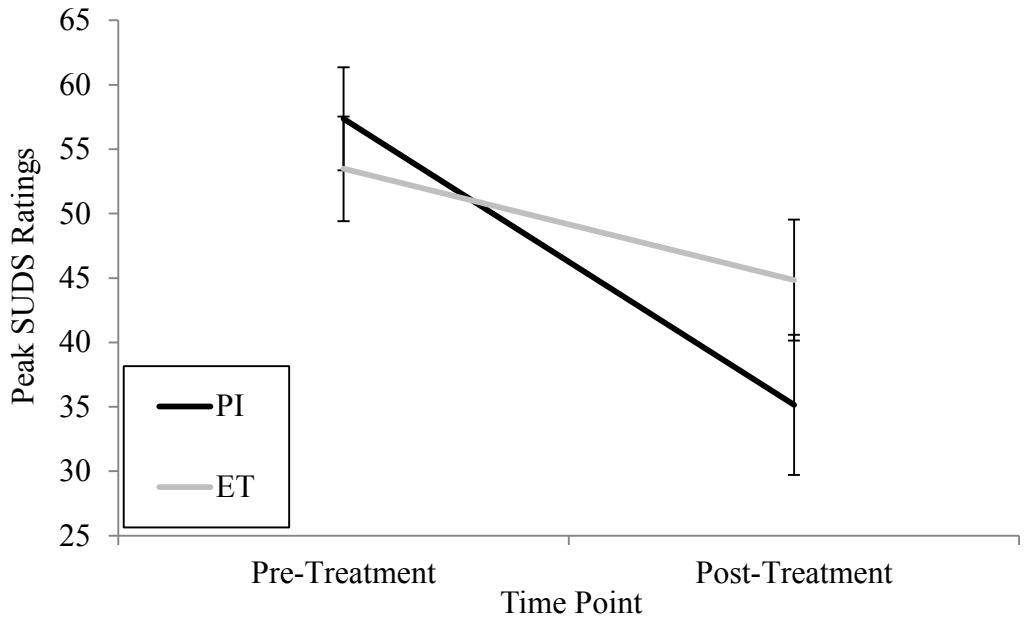

Figure 2. Mean peak SUDS ratings. $N = 62$. SUDS = Subjective Units of Distress Scale. PI = Participant-initiated condition. ET = Experimenter-initiated time condition. Error bars represent standard errors.

To compare self-efficacy ratings between PI and ET, a one-way ANOVA was conducted on self-efficacy ratings that were obtained on the exposure trial immediately following safety behavior elimination (see Measures, above). This analysis revealed a significant effect of condition, $F(1, 60) = 11.02$, $p = .002$, $\eta_p^2 = .16$, such that the PI group ($M = 90.65$, $SD = 14.58$) reported greater self-efficacy than the ET group ($M = 67.10$, $SD = 36.72$) during this trial.

3.4.3. Comparisons between PI and ED (Hypothesis 1b). To compare the efficacy of PI and ED, a series of 2 x 2 (condition x time) mixed ANCOVAs were conducted on contamination fear severity scores, obsessive beliefs, and SUDS ratings at pre- and post-treatment. Due to significant differences in the trial at which participants in PI and ED eliminated their safety aid (see above), all analyses were conducted while covarying the trial at which the safety aid was dropped. There were significant main effects of time on the OBQ, $F(1, 56) = 10.66$, $p = .002$, $\eta_p^2 = .16$, and SUDS [Anticipatory, $F(1, 56) = 19.76$, $p < .001$, $\eta_p^2 = .26$; Peak, $F(1, 56) = 21.35$, $p < .001$, $\eta_p^2 = .28$], indicating that obsessive beliefs and subjective fear decreased over time. There was a trend for a main effect of time on VOCI-Contamination, $F(1, 56) = 3.40$, $p = .071$, $\eta_p^2 = .06$, indicating that contamination fear severity decreased to a

marginal degree over time. A one-way ANCOVA controlling for pre-treatment BAT revealed no condition differences on post-treatment BAT, $F(1, 55) = 2.55$, $p = .116$, $\eta_p^2 = .04$[3]. There were no significant interactions.

To compare self-efficacy between PI and ET, a one-way ANCOVA was conducted on self-efficacy ratings during the trial immediately following safety behavior elimination (see Measures, above). Again, the trial at which safety behavior was eliminated was entered as a covariate. This analysis revealed a significant effect of condition, $F(1, 56) = 5.19$, $p = .027$, $\eta_p^2 = .09$, such that PI ($M = 90.65$, $SD = 14.58$) had greater self-efficacy than ED ($M = 77.07$, $SD = 28.78$) during this trial.

3.5. Treatment Credibility and Acceptability (Hypothesis 2a and 2b)

3.5.1. Comparisons between PI and ET (Hypothesis 2a). To compare PI and ET on treatment credibility and acceptability, a series of independent samples *t* tests were conducted on CEQ and EDS scores. There was a trend for CEQ Expectancy, $t(60) = 1.80$, $p = .078$, $d = .46$, such that PI ($M = 15.61$, $SD = 4.86$) received marginally higher expectancy ratings than ET($M = 13.19$, $SD = 5.72$). There were no condition differences in CEQ Credibility or EDS (both ts < .50, both ps > .05, both ds < .13).

3.5.2. Comparisons between PI and ED (Hypothesis 2b). To compare PI and ED on treatment credibility and acceptability, a series of independent samples *t* tests were conducted on CEQ and EDS scores, which revealed no significant condition differences (all ts < 1.55, all ps > .05, all ds < .41).

4. Discussion

The aim of this study was to compare participant- and experimenter-initiated fading of safety behavior during exposure to contamination. To enhance both experimental design and ecological validity, there were two experimenter-initiated conditions, one which controlled for time and the other which was based on decreasing subjective distress ratings. All conditions improved on measures of behavioral approach and obsessive beliefs. Compared to the experimenter-initiated time (ET) condition, the participant-initiated (PI) condition demonstrated greater reductions in obsessive beliefs and peak fear, greater self-efficacy, and marginally higher

[3] This analysis was repeated without the pre-exposure BAT as the covariate as a 2 x 2 (condition x time) mixed ANCOVA, controlling for the trial at which safety behavior was dropped. This analysis revealed a marginal main effect of condition, $F(1, 56) = 3.72$, $p = .059$, $\eta_p^2 = .06$ and a significant interaction, $F(1, 56) = 5.86$, $p = .019$, $\eta_p^2 = .10$, such that the ED group demonstrated greater increases in BAT than PI.

treatment expectancy ratings. PI and experimenter-initiated distress (ED) were generally comparable in terms of treatment outcome and acceptability, although participants in the PI condition endorsed higher self-efficacy ratings during exposure. The findings suggest that exposure with the judicious use of safety behavior may be more effective and acceptable when participants/clients determine the progression of the exposure session.

It was hypothesized that the PI condition would demonstrate superior treatment outcome and greater self-efficacy as compared to both the ET and ED conditions. This hypothesis was partially supported. Compared to the ET condition, participants in the PI condition demonstrated greater pre- to post-exposure reductions in obsessive beliefs and subjective anxiety, as well as higher self-efficacy ratings immediately following safety behavior fading. These results support the self-efficacy theory of anxiety (Bandura, 1977, 1988), which postulates that activities which promote a sense of confidence and control in threatening situations will reduce fear and avoidance behavior. Indeed, PI was *intended* to enhance perceptions of self-efficacy and control, as the participants themselves decided when to drop the safety behavior in this condition. These findings are also consistent with Rachman et al. (2008), who proposed that safety behavior may enhance the efficacy and acceptability of exposure via increases in self-efficacy and control. Recent research suggests that safety behavior may enhance perceived control over distressing emotions during exposure, which may lead to more favorable treatment outcomes (van den Hout et al., 2011). Indeed, there has been growing empirical interest in the notion of distress tolerance, or the ability to accept rather than experientially avoid uncomfortable emotions, which is considered by some to be an important mechanism of change in exposure therapy (Craske et al., 2008). As such, it could be that safety behavior increases tolerance to manage anxiety-provoking situations, which in turn may enhance exposure efficacy. Based on the current study's results, ESB may be more effective when combined with specific activities that promote self-efficacy and control, such as participant-initiated safety behavior fading. However, it should be noted that PI did not differ from ET on other measures of contamination fear severity in this study (e.g., behavioral approach). Nevertheless, greater reduction in obsessive beliefs in the PI condition may be a more important finding, as cognitive theory suggests that belief change is an important determinant of behavioral change and symptom reduction (e.g., Hofmann, Asmundson, & Beck, 2013). Indeed, Rachman et al. (2008) proposed that safety behavior may facilitate the acquisition of disconfirmatory information, resulting in greater cognitive change

during treatment. Of course, the degree to which safety behavior promotes belief change beyond a single session of exposure is an empirical question that was not addressed in this study. Furthermore, although previous studies have found significant reductions in threat beliefs following a single session of exposure (e.g., Milosevic & Radomsky, 2013a), it is somewhat surprising that belief endorsement decreased following a brief, single-session intervention, and so it will be important to replicate our findings over a longer intervention and follow-up period.

Contrary to hypotheses, the PI condition did not demonstrate superior treatment outcome as compared to the ED condition, although self-efficacy ratings were significantly higher in PI. This is a surprising finding, as PI was more effective than the other experimenter-initiated condition (ET) on several outcome measures. Based on self-efficacy theory (Bandura, 1977, 1988), it follows that ED would result in poorer outcomes as compared to PI, as participants in the ED group did not have control over safety behavior fading. Indeed, several participants assigned to ED made comments to suggest that they felt anxious during the exposure session simply because they did not know when they would be asked to drop the safety behavior. Nevertheless, these results indicate that experimenter-initiated safety behavior fading (based on subjective distress) did not undermine the efficacy of ESB. On the other hand, it could be that participants in the ED condition perceived some level of control over safety behavior fading during the exposure session, as they were told that they would be asked to drop the safety aid "as their distress level comes down", which is based on the participants' own emotional reactions. As such, similar to the PI condition, participants in ED may have benefitted from increased self-efficacy and control during exposure, thus leading to favorable outcomes. Indeed, although self-efficacy ratings were higher in PI as compared to ED, the average self-efficacy rating in the ED condition was approximately 77 (on an 100-point scale), suggesting that participants in ED experienced a high level of self-efficacy during exposure. However, it should be noted that the time at which participants were asked to drop the safety behaviour could not be methodologically controlled in the ED condition, which may have impacted these results. As described previously, we felt it was important to include the ED condition in order to simulate a more traditional exposure session, which progresses based on decreasing SUDS ratings. Nevertheless, it will be important to replicate and extend our results in the absence of a time confound.

Finally, it was hypothesized that the PI condition would be rated as more acceptable than both experimenter-initiated conditions. This hypothesis was not supported, as there were no

between-group differences in perceptions of treatment credibility and acceptability. PI received marginally higher treatment expectancy ratings as compared to ET, indicating that participants in the PI condition may have expected greater improvement in their contamination fear symptoms than participants in ET. Nevertheless, these differences were not statistically significant. The findings contrast with Rachman et al. (2008), who proposed that safety behavior may enhance treatment acceptability via increases in self-efficacy beliefs during treatment. As such, it follows that treatment activities which promote perceptions of self-efficacy and control (such as participant-initiated safety behavior fading) may be considered more acceptable. It should be noted that acceptability ratings as assessed by the EDS were indeed numerically higher in the PI condition (M = 71.35, SD = 10.24) as compared to ET (M = 69.87, SD = 13.61) and ED (M = 65.50, SD = 17.87), although these differences were negligible and not statistically significant. In our previous work, ESB for contamination fear received lower acceptability ratings as assessed by the EDS (M = 57.27, SD = 17.65; see Levy & Radomsky, 2014) than all three ESB conditions in the current study (see mean ratings above). As such, it is possible that a restricted range in EDS scores may have affected our ability to detect between-groups differences, as all three fading conditions received high acceptability ratings in this study. Previous research suggests that safety behavior may enhance perceptions of treatment acceptability and anticipated adherence as compared to traditional exposure (Levy & Radomsky, 2014; Levy et al., 2014; Milosevic & Radomsky, 2013b). Therefore, it could be that the mere presence of safety behavior, regardless of who decides when to fade it, increases acceptability and credibility. Of course, replication and extension of this work will be important, as a single session of ESB is inadequate to assess the acceptability of a full course of CBT with the judicious use of safety behavior.

Taken together, the results of the current study suggest that anxious individuals may fare better in treatment when they have more control over the progression of exposure. This can be more explicit, verbal control, as in the case of the PI condition, or more indirect control, as in the ED group. However, it should be noted that participants in the ET condition demonstrated improvement on several measures of symptom severity, indicating that participant- versus experimenter-initiated fading of safety behavior may only have a small impact on treatment outcome. There may be several explanations for these findings. First, contrary to cognitive-behavioral theory on the detrimental effects of safety behavior (Salkovskis, 1991; Salkovskis et

al., 1996), recent research supports the efficacy of ESB for a range of anxiety and related problems, including contamination fear (Goetz & Lee, 2015; Hood et al., 2010; van den Hout et al., 2011; Milosevic & Radomsky, 2008, 2013a; Rachman et al., 2011; Sy et al., 2011). As such, it could be that the manner in which safety behavior is faded during exposure has little impact on an otherwise effective treatment such as ESB. Second, recent literature suggests that safety behavior may improve outcomes in exposure by enhancing cognitive change (van den Hout et al., 2011; Milosevic & Radomsky, 2013a). In light of these findings, it is possible that the presence of the safety behavior, regardless of how it was faded, may have led to favorable outcomes in the current study. Indeed, all conditions improved on measures of cognitive change in this study, suggesting that safety behavior was effective in promoting (or at least not hindering) threat disconfirmation. Overall, the findings of the current study lend additional support to a growing literature on the effectiveness of ESB, at least in the short term. What remains to be addressed is the impact of safety behavior over a longer period of treatment and follow-up, which was not assessed in this study and has generally been neglected in the safety behavior literature.

The current study is not without limitations. First, a subclinical sample limits the generalizeability of the findings to clinical samples of individuals with diagnosable anxiety problems. As such, replication and extension of the findings in clinical samples will be important. Second, self-efficacy was assessed using a single-item prompt with unknown psychometric properties. Although measures of self-efficacy in contamination fear have recently become available (e.g., Levy & Radomsky, in press), we felt that assessing self-efficacy *during* exposure would more accurately capture changes in self-efficacy as a function of safety behavior fading than measures of general (i.e., non-specific) contamination-related self-efficacy. Nevertheless, future research should replicate and extend our results using validated measures of self-efficacy in anxiety. Third, treatment acceptability ratings were generally high across conditions in the current study, which may have interfered with our ability to detect between-groups differences in acceptability (due to a restricted range in EDS scores). Fourth, the single-session design of the current study is inadequate to assess treatment outcome and acceptability in a complete exposure therapy protocol varying in safety behavior fading. Furthermore, the absence of a no-safety behavior control condition precludes our ability to assess the efficacy of ESB when compared to traditional exposure. As such, it will be critical to extend these findings

over a longer course of intervention that more accurately represents the length of standard CBT protocols and includes an exposure-only control group. Fifth, to ensure the success of the yoking procedure (see description above), we were unable to randomly assign participants to condition in the current study, which may have impacted our results. Similarly, in order to minimize confounds we felt it was important to standardize the procedure of the ED condition (i.e., fading safety behavior at a SUDS level of 50% or less of the initial trial rating), which may not represent standard clinical practice. Indeed, in clinical settings safety behavior fading is often determined collaboratively between the client/patient and therapist. Finally, Rachman et al. (2008) initially defined the judicious use of safety behavior as the implementation and then fading of safety behavior over a longer intervention period (e.g., incorporating safety behavior into several exposure sessions, and then gradually fading it out). Using a single-session design, we were unable to assess the efficacy and acceptability of the judicious use of safety behavior as it was initially defined.

4.1. Conclusion

In conclusion, there are a number of important questions that remain about the judicious use of safety behavior that were not addressed in the current study. Nevertheless, to our knowledge no prior studies have attempted to operationalize and define the practice of safety behavior fading, and so the current study has the potential to contribute to the literature on the judicious use of safety behavior in research and clinical practice. Based on our results, ESB may be more effective when participants/clients control safety behavior fading, either by their verbal indication or by their own emotional reactions. It is our hope that this research will inspire future work on the judicious use of safety behavior in CBT, particularly regarding the development of practical guidelines for the incorporation of safety behavior into evidence-based treatments.

CHAPTER 5:
GENERAL DISCUSSION

This program of research was designed to address the practical aspects of incorporating safety behaviour into exposure-based treatments for anxiety and related disorders. Recent theory (Parrish et al., 2008; Rachman et al., 2008) and experimental research (Levy & Radomsky, 2014; Levy et al., 2014; Milosevic & Radomsky, 2013a) suggest that the judicious use of safety behaviour may enhance the acceptability of exposure. However, to this author's knowledge, there are currently no published recommendations for the judicious use of safety behaviour in CBT, and practical questions remain about how to employ safety behaviour in treatment. To address some of these questions, Study 1 compared the efficacy and acceptability of exposure with different types of safety aids, while Study 2 examined the effect of participant- versus experimenter-initiated fading of safety behaviour during exposure. Given the mixed and inconclusive findings on the impact of using safety behaviour in treatment, this program of research also aimed to elucidate the conditions under which safety behaviour may be beneficial versus deleterious to treatment success. Finally, most published studies of safety behaviour in exposure have recruited undergraduate student samples, and so I aimed to address this gap in the literature by recruiting a clinical sample of individuals with diagnosable OCD as well as a subclinical sample of individuals with elevated contamination fears.

Summary of findings

Study 1. To assess the efficacy and acceptability of exposure with different kinds of safety behaviour, clinical participants with OCD and contamination fear ($N = 57$) were randomly assigned to receive an exposure session with no safety aid (ERP), a routinely-used safety (RU), or a never-used safety aid (NU). Results demonstrated that all groups improved on measures of contamination fear severity, behavioural approach to a feared stimulus, and subjective distress ratings. However, some between-groups differences in outcome and acceptability were observed. As compared to RU, the NU condition demonstrated significantly lower self-reported contamination fear severity at post-treatment, as well as significantly higher treatment acceptability and anticipated adherence ratings. NU and ERP were generally comparable in both outcome and acceptability, although there were some differences in favour of NU. Taken together, the findings support the efficacy and acceptability of exposure with safety behaviour. These results diverge from traditional cognitive-behavioural models of safety behaviour in

anxiety disorders (Salkovskis, 1991; Salkovskis et al., 1996), but support the notion that safety behaviour is not *always* deleterious to treatment outcome, and may even be beneficial under certain conditions (Parrish et al., 2008; Rachman et al., 2008).

Study 2. In order to compare the efficacy and acceptability of participant- and experimenter-initiated fading of safety behaviour during exposure, participants with subclinical contamination fear ($N = 100$) were assigned to receive an exposure session under one of three fading conditions: 1) participant-initiated (PI); 2) experimenter-initiated time (ET), in which the timing of safety behaviour fading was yoked to that which was observed in the PI condition; or 3) experimenter-initiated distress (ED), in which fading was based on decreasing subjective fear ratings. Compared to ET, the PI condition demonstrated greater reductions in obsessive beliefs and peak fear, as well as marginally higher treatment expectancy ratings. There were no differences in outcome or acceptability between the PI and ED conditions. Consistent with self-efficacy theory (Bandura, 1977, 1988), these findings suggest that participant-initiated fading of safety behaviour may be more effective and acceptable. These results support recent experimental research on the potential benefits of using safety behaviour in CBT, particularly with regard to treatment acceptability (e.g., Milosevic & Radomsky, 2013a) and cognitive change (e.g., Milosevic & Radomsky, 2013b). Consistent with Study 1, these findings are contrary to traditional cognitive-behavioural accounts of the detrimental effects of safety behaviour (Salkovskis, 1991; Salkovskis et al., 1996), and instead suggest that safety behaviour may actually *facilitate* belief change and symptom reduction, at least in a single-session intervention.

Theoretical implications

As reviewed previously, there are several theories to explain the potential deleterious effects of safety behaviour on treatment outcome. Traditional behavioural theory suggests that safety behaviour interferes with IFA during exposure, which is considered by some to be an important mechanism of change in exposure-based treatments (Foa & Kozak, 1986). Cognitively-based approaches suggest that safety behaviour may interfere with threat disconfirmation via attentional processes (Sloan & Telch, 2002) or misattributions of safety (Salkovskis, 1991; Salkovskis et al., 1996). Finally, neurobehavioural theory posits that safety behaviour may prevent the development of inhibitory (non-threat) associations during exposure (Craske et al., 2008, 2014). This program of research may have the most direct implications for

cognitively-based theories of safety behaviour, as IFA and inhibitory learning were not explicitly assessed in these studies. In particular, Salkovskis (1991) proposed that safety behaviour maintains anxiety by preventing disconfirmatory experiences, as anxious individuals who use safety behaviour when faced with threat may misattribute the non-occurrence of feared outcomes to the presence of the safety behaviour. Based on the findings of the current research, safety behaviour may not necessarily interfere with disconfirmation as originally proposed. Across two independent samples, the current studies demonstrated that safety behaviour did not undermine the efficacy of exposure, as all participants (whether they were using safety behaviour or not) demonstrated significant reductions in contamination fear severity, behavioural avoidance, and subjective anxiety. Even routinely-used safety aids, which may be more likely to interfere with disconfirmation due to their frequent (and unnecessary) use, did not impair symptom reduction and cognitive change in the current research. Consistent with recent calls for a "reconceptualization" of safety behaviour in CBT (Rachman et al., 2008), these findings suggest that safety behaviour may not interfere with treatment outcome, at least in a single session of exposure. What remains to be addressed is the degree to which safety behaviour impacts treatment efficacy over a longer course of intervention and follow-up, neither of which was assessed in these studies. However, given that Salkovskis et al. (1996) theorized that safety behaviour may prevent disconfirmation if used in *any* feared situation (even just one), the findings of the current studies may still have implications for cognitive-behavioural theory on safety behaviour.

The current research may also shed light on the factors which determine whether safety behaviour is facilitative versus detrimental to treatment outcome. Indeed, inhibitory learning theory (Craske et al., 2014) posits that the effect of safety behaviour on corrective learning is determined by the strength of the safety behaviour in reducing anxiety as well as the potency of the feared stimulus in evoking anxiety. As such, inhibitory learning theory may support the notion that safety behaviour is not always counter-therapeutic, and may only have a detrimental impact if this *combination* of factors is met. Indeed, based on the findings of the current studies, there may be certain situations in which safety behaviour is beneficial (or at least not harmful) to treatment success. In particular, the current results suggest that incorporating novel safety aids into treatment and allowing participants/clients to determine the progression of the exposure session may be two conditions under which safety behaviour is benign (or even potentially

facilitative) to treatment outcome. Indeed, meeting these two conditions actually improved treatment efficacy on certain outcome variables in the current investigations. As such, novel safety aids and participant-initiated safety behaviour fading may be two ways in which to enhance the efficacy of ESB, although replication and extension of this work over a longer period of intervention and follow-up is needed.

Finally, the current research may have implications for theory on the acceptability-enhancing potential of safety behaviour in CBT. Rachman et al. (2008) proposed that safety behaviour may enhance treatment acceptability, and thus reduce problematic dropout and refusal rates in exposure-based treatments. The current research found some support for this theory. In Study 1, exposure with never-used safety aids received marginally higher treatment acceptability and anticipated adherence ratings than exposure with routinely-used safety aids, as well as marginally higher ratings than traditional exposure (ERP). Based on these findings, exposure with certain kinds of safety behaviour (in this case, those which are novel) may enhance the acceptability of exposure, whereas other kinds of safety behaviour (i.e., those which are frequently used) may not. Study 2 found that exposure with participant-initiated safety behaviour fading received marginally higher treatment expectancy ratings than exposure with experimenter-initiated fading. However, there were no condition differences in treatment acceptability. Taken together, the findings indicate that safety behaviour does not always enhance acceptability, but may do so under certain conditions. Indeed, previous studies have shown that safety behaviour enhances acceptability to a greater degree when cognitively-based rationales are used in treatment, as compared to when extinction-based rationales are provided (Levy et al., 2014; Milosevic & Radomsky, 2013a). As such, it appears that the way in which safety behaviour is incorporated into treatment may affect its acceptability-enhancing potential. However, these results should be interpreted with caution, as mean comparisons were not statistically significant (possibly due to inadequate statistical power). Furthermore, the degree to which safety behaviour reduces treatment dropout and refusal is an empirical question that was not addressed in the current research. Nevertheless, these studies provide preliminary support for Rachman et al. (2008), and suggest that safety behaviour may enhance perceptions of treatment acceptability, at least in a brief, single-session intervention.

Clinical implications

This program of research aimed to make a first attempt at addressing some of the practical considerations for implementing safety behaviour in CBT. The need for this research arose when preliminary results suggested that safety behaviour may be helpful in treatment (e.g., by enhancing treatment acceptability), but specific guidelines for how to use safety behaviour in CBT were lacking. Based on the findings from Study 1, novel safety behaviour may be the most appropriate choice for use in treatment. Indeed, participants in the NU condition had lower contamination fear severity at post-treatment than participants in RU and ERP. On the other hand, it should be noted that traditional exposure (ERP) and exposure with routinely-used safety aids were also effective in reducing contamination fear severity in the current research. As such, it could be that *in vivo* exposure to feared stimuli is so effective that the presence (or absence) of safety behaviour has relatively little impact. Nevertheless, it is noteworthy that routinely-used safety aids did not interfere with symptom change among clinically anxious individuals in the current research. Given that the majority of previous research on safety behaviour has recruited undergraduate student samples (e.g., Hood et al., 2010; Milosevic & Radomsky, 2008; Sy et al., 2011), this is an interesting and important finding. Based on these results, it could be that safety behaviour is particularly effective in promoting symptom reduction among individuals with more severe fears. Indeed, Rachman et al. (2008, 2011) suggested that safety behaviour may be especially helpful for severe cases of anxiety, including individuals who did not tolerate and/or failed to respond to ERP. Alternatively, it could be that participants in the RU condition felt confident and in-control during the exposure because they were permitted to use their own, *most important* safety aid during the session. Rachman et al. (2008) suggested that *any* safety behaviour, if used strategically in treatment, may promote self-efficacy and control and thus enhance exposure efficacy. From a cognitive perspective, it is possible that participants in the RU group used the exposure session to test out their beliefs about the necessity of the safety behaviour and/or its role in reducing distress, and thus may have obtained useful and potentially corrective information during the session. Of course, these interpretations and suggestions for clinical practice are preliminary, and must be evaluated in future studies, especially those involving treatment-seeking participants with diagnosable anxiety disorders receiving full packages of CBT assessed over a meaningful follow-up period.

Study 2 aimed to address the practical aspects of safety behaviour fading, and compared the efficacy and acceptability of participant- and experimenter-initiated fading of safety

behaviour during exposure. The results indicated that participant-initiated fading and experimenter-initiated fading based on subjective distress ratings were particularly effective in reducing contamination fear severity and obsessive beliefs, although participants in the time-based condition also demonstrated improvement on these measures. Based on these findings, allowing anxious individuals to control the progression of exposure (either based on verbal indication or subjective distress) may enhance the efficacy of ESB. In the clinic, these decisions are often made in a collaborative fashion, with both client and therapist contributing equally to the therapy discussion. Based on the current findings, however, it may be beneficial for clients to take the lead on these decisions, rather than a purely collaborative and equitable approach. These results are consistent with self-efficacy theory on the importance of building self-confidence and control during treatment in order to enhance therapeutic success (Bandura, 1977, 1988). Further, as originally proposed by Rogers (1957), a necessary condition for therapeutic change is the therapist's genuine and empathic understanding of the client and his/her problem *from the client's perspective*. Perhaps the best way to achieve this understanding is by allowing clients to determine the progression of therapy, including individual exposure sessions. In terms of clinical practice, the current results may translate to allowing anxious individuals to decide when to eliminate safety behaviour in a given exposure session and/or over the course of treatment, as exposure becomes more and more challenging. Again, these suggestions for clinical practice are preliminary, and must be investigated in future studies. Nevertheless, it appears that activities which promote a sense of mastery and control during treatment may facilitate fear reduction, and as such may be useful in CBT.

Beyond some of the specific practical considerations for incorporating safety behaviour into exposure-based treatments, this program of research may also have implications for clinical practice more generally, particularly in regards to the judicious use of safety behaviour. First, given that ESB was comparably effective to traditional exposure (ERP) in the current research, perhaps clinicians should have greater flexibility to use safety behaviour in treatment. In a more traditional CBT approach, clinicians are taught to advise their clients to eliminate all safety behaviours as soon as possible during treatment, or else the therapy will be ineffective. Given the findings of the current studies and other recent work (e.g., Hood et al., 2010; Milosevic & Radomsky, 2013b; Rachman et al., 2011; Sy et al., 2011), clinicians may consider adopting a more flexible approach to safety behaviour in treatment, particularly for clients/patients who

have difficulty committing to exposure and/or engaging with it. In these situations, clinicians may propose the strategic use of safety behaviour for early exposure sessions, in order to promote client engagement and perceptions of self-efficacy and control. Second, the ability to (judiciously) use safety behaviour in CBT may foster greater client involvement in clinical decision-making. For instance, if a client seems particularly reticent about or afraid of exposure, then the client can be given the choice to use safety behaviour in the session, as well as the control over when to eliminate the safety behaviour during the session. Of course, as initially proposed by Bandura (1977, 1988), promoting self-confidence and control during treatment (including clinical decision-making) may correspond to better outcomes. Third, a more flexible approach to safety behaviour in clinical practice may increase the number of available treatment procedures and techniques. For example, clinicians could use safety behaviour in a given exposure session or across multiple sessions, or they could use safety behaviour in an entirely different way, such as to test specific predictions about the use, necessity, and/or helpfulness of the safety behaviour. Future research is needed in order to validate these suggestions for clinical practice. However, given the extant literature, it appears that at least some flexibility regarding the use of safety behaviour in CBT is warranted.

Limitations and future directions

There are several limitations of the current research program that warrant attention. First, the single-session design of these studies precludes the ability to assess the impact of safety behaviour over a longer course of intervention and follow-up, both in terms of treatment outcome and perceptions of acceptability. Indeed, the majority of previous studies on safety behaviour have employed single-single designs (e.g., Hood et al., 2010; McManus et al., 2008; Milosevic & Radomsky, 2008, 2013b; Powers et al., 2004; Sy et al., 2011), which do not provide any information about the long-term implications of using safety behaviour in exposure-based treatments. As such, future research should consider employing multi-session designs that better represent the length of standard CBT protocols (e.g., 12 sessions), as well as short- and long-term follow-up assessments. This research will be important for several reasons. First, studies employing multi-session designs with a follow-up period may clarify mixed and inconclusive findings regarding the impact of safety behaviour in CBT. Indeed, it is possible that safety behaviour does not undermine treatment efficacy in the short term, but may be highly problematic if used over the longer term. Second, multi-session designs would provide

important information about treatment acceptability and adherence. Given that Rachman et al. (2008) proposed that safety behaviour may reduce dropout and refusal rates in exposure-based treatments, it is critical that the effect of safety behaviour on treatment retention rates be explicitly assessed. Again, it could be that safety behaviour enhances the acceptability of a single-session intervention, but may have no beneficial impact over a longer course of treatment. Third, multi-session designs with follow-up assessments may elucidate the factors which determine whether safety behaviour is helpful versus harmful to treatment outcome. Based on the findings of the current research and some theoretical work (Rachman et al., 2008), it could be that safety behaviour is helpful for individuals with severe anxiety problems and/or among those who have failed to respond to traditional ERP. Of course, these are empirical questions that can only be adequately assessed in a full-length treatment protocol.

A second limitation of the current research is the absence of adequate rationales for safety behaviour elimination. In clinical practice, it is recommended that therapists conduct detailed discussions with their clients/patients about the potential for safety behaviour to maintain anxiety symptoms and/or to undermine treatment success (e.g., Abramowitz et al., 2011). Because the current studies were brief and experimental in nature, only a short description of safety behaviour could be provided to participants. Without a comprehensive understanding of safety behaviour and its potential implications, participants may not have been able to adequately assess their perceptions of an intervention that incorporates safety behaviour. On the other hand, given the mixed findings on the effect of safety behaviour in treatment, it is unclear how a more thorough and comprehensive description of safety behaviour should be structured. Current cognitive-behavioural treatment manuals recommend that the concept of safety behaviour be introduced during psychoeducation, and described as problematic and likely to undermine treatment success (e.g., Abramowitz et al., 2011; Foa et al., 2012). This information may now be insufficient as it does not take into account the extant literature. Nevertheless, the brief descriptions of safety behaviour that were provided in the current studies are likely inadequate to assess the efficacy and acceptability of ESB. As such, future research should consider providing a more thorough and comprehensive description of safety behaviour prior to initiating exposure. This way, participants will have enough information to assess their perceptions of the intervention.

Another important limitation concerns the judicious use of safety behaviour, which was initially defined as the strategic implementation of safety behaviour in the early and/or more challenging stages of treatment and then gradually faded out (Rachman et al., 2008). Based on this definition, it appears that the authors intended that safety behaviour be used over a longer course of intervention than what was employed in the current studies. Indeed, in order to incorporate safety behaviour into particularly difficult sessions and to gradually eliminate it, a longer intervention than a single session is needed. As such, it is possible that the current research did not assess the efficacy and acceptability of the judicious use of safety behaviour as it was initially defined. In light of this limitation, future researchers may wish to consider expanding upon the current studies in several ways. First, the original definition of judicious use specifies incorporating safety behaviour in the early and more challenging stages of treatment. As such, future studies may consider assessing outcome while implementing safety behaviour in early treatment sessions and then gradually fading it out, as well as following incorporation of safety behaviour into particularly challenging sessions (e.g., sessions that involve exposure to stimuli at the top of the fear hierarchy). Second, Rachman et al. (2008) described the potential benefits of using safety behaviour within a cognitive framework, in which safety behaviour was theorized to improve outcomes by facilitating disconfirmatory experiences. As such, future studies may consider assessing the efficacy and acceptability of using safety behaviour in a cognitively-focused treatment. For example, safety behaviour may be implemented in behavioural experiments that are designed to test specific predictions about the necessity of safety behaviour. Furthermore, previous research has shown that descriptions of cognitively-based CBT incorporating safety behaviour are rated as more acceptable than descriptions of extinction-based CBT with safety behaviour (Levy et al., 2014; Milosevic & Radomsky, 2013a), and so further evaluation of safety behaviour within a cognitively-focused treatment is warranted.

Finally, the current research examined the impact of safety behaviour in the context of exposure-based treatment for contamination fear, which limits the generalizeability of the results to other interventions and mental health problems. Given that previous research has implicated safety behaviour in the maintenance of many psychological problems, including panic disorder with agoraphobia (e.g., Salkovskis et al., 1999), social anxiety disorder (SAD; e.g., McManus et al., 2008; Rowa et al., 2014; Taylor & Alden, 2010), claustrophobic fear (e.g., Powers et al.,

2004), generalized anxiety disorder (GAD; e.g., Beesdo-Baum et al., 2012), health anxiety (e.g., Olatunji, Etzel, Tomarken, Ciesielski, & Deacon, 2011), insomnia (e.g., Hood, Carney, & Harris, 2011), and schizophrenia (e.g., Chaix et al., 2014), it will be important to determine the effect of safety behaviour on treatment outcome and acceptability for other problems besides contamination fear. Indeed, it is possible that safety behaviour has only a benign impact on exposure-based treatment for contamination fear, but is detrimental to outcome in the context of other psychological disorders. Furthermore, recent research suggests that individuals with certain anxiety disorders (e.g., SAD) are more likely to employ safety behaviour in threatening situations than individuals with other anxiety disorders (e.g., GAD) and healthy controls (Rowa et al., 2014); in addition, much (although not all) of the research demonstrating the countertherapeutic nature of safety behaviour has been established with participants diagnosed with SAD. As such, it will be interesting and important to assess the impact of safety behaviour in CBT for different anxiety disorders and other mental health problems. These investigations will aid in the assessment of safety behaviour in clinical practice, and may also inform the development of practical guidelines for using (or eliminating) safety behaviour in treatment.

There are other important areas for study in the safety behaviour literature. First, as described previously, there is no consensus about how to classify safety behaviour as adaptive or maladaptive coping strategies (Thwaites & Freeston, 2005). In fact, to this author's knowledge only one prior study has examined the impact of different types of safety behaviour on treatment outcome in exposure therapy for anxiety (Goetz & Lee, 2015). In particular, the authors compared the efficacy of exposure with preventive (i.e., used to prevent contact with a feared stimulus) and restorative (i.e., used to restore safety following contact with a feared stimulus) safety aids, and reported that exposure with restorative safety aids was more effective in reducing contamination fear severity. However, this study used an undergraduate student sample of healthy (non-clinical) individuals, which limits the generalizeability of the results to clinically anxious samples. Given the mixed findings concerning the impact of safety behaviour in exposure, it is important to establish a classification system that may account for the discrepant results. This classification system will have implications for the assessment of safety behaviour in clinical settings, and it will inform the development of established guidelines for the elimination (or possible incorporation) of safety behaviour in CBT. As suggested by Thwaites and Freeston (2005), certain safety behaviours may be adaptive in threatening situations, and as

such their use may not interfere with treatment efficacy. By contrast, other safety behaviours may actually increase the likelihood of feared outcomes, and thus may be more likely to prevent disconfirmation and undermine treatment efficacy. For example, previous research has shown that individuals with SAD who employ safety behaviour in social situations receive poorer performance ratings than individuals who refrain from using safety behaviour (e.g., Furukawa et al., 2009; McManus et al., 2008; Taylor & Alden, 2010). Without a proper classification system to distinguish adaptive and maladaptive coping strategies, it will be difficult for clinicians to assess and intervene with regard to safety behaviour.

Another important area for future study concerns the impact of covert (subtle) safety behaviour on treatment outcome. Examples of covert safety behaviour include engaging in mental self-reassurance and thinking of pleasant or calming images. Previous research has generally neglected the effect of covert safety behaviour on treatment outcome, and as such it is unclear whether covert safety behaviour has a deleterious impact on treatment efficacy. The exception is distraction (e.g., reading a book or watching television to avoid thinking about feared situations), which has been examined in several studies on exposure-based treatments for anxiety disorders (e.g., Johnstone & Page, 2004; Kamphuis & Telch, 2000; Penfold & Page, 1999). Similar to the overt safety behaviour literature, mixed findings on the impact of distraction in exposure preclude any substantive conclusions. As such, it is unclear whether covert safety behaviour interferes with outcome, or may be beneficial in certain cases. Current cognitive-behavioural theory (Salkovskis et al., 1996) suggests that any behaviour that is performed in order to prevent feared outcomes, including subtle avoidance behaviour, may interfere with disconfirmation. Nevertheless, it will be important to explicitly assess the effect of covert safety behaviour in CBT.

Conclusion

In sum, there are a number of important questions that remain about safety behaviour and its impact on treatment efficacy and acceptability. There is a need for assessing the effect of safety behaviour over a longer period of intervention and follow-up, both in terms of treatment outcome and dropout/refusal rates. Furthermore, future research is hampered by a lack of consensus regarding the classification of safety behaviour as beneficial or detrimental to fear reduction. Beyond these suggestions for future study, it will be interesting and important to expand upon the current research in several other ways. First, there are many questions about the

judicious use of safety behaviour that remain. For instance, how should safety behaviour be faded across treatment sessions, if it is used for more than one? Should safety behaviour only be used in session with a therapist, or can it also be implemented in homework exercises? What about safety behaviours that are not objects, such as trusted others or caregivers? Objects may be easy enough to incorporate into exposure sessions, but specific people may present ethical and logistical challenges. Second, it will be interesting to further investigate the categorization of safety behaviour as detrimental or benign to fear reduction based on the short-term effects of its use. Given that certain safety behaviours have paradoxical short-term effects, such that they actually *increase* the likelihood of feared outcomes (e.g., socially anxious individuals who avoid eye contact during a social gathering may be perceived as "weird" or unfriendly), it is likely that these behaviours are detrimental to symptom change. By contrast, safety behaviours which are employed simply for comfort purposes (e.g., carrying around a "lucky" penny on exam day) may not be deleterious to treatment outcome. Finally, and of particular interest to this author, it will be important to examine safety behaviour use in special populations and underserved groups, such as military veterans and victims of sexual violence. It is possible that these individuals may utilize safety behaviours that are objectively dangerous or hazardous (e.g., weapons, mace, pepper spray), which may pose a unique ethical dilemma in treatment.

Although this research program did not address any of these gaps in the literature, the current studies made a first attempt at establishing practical guidelines for the judicious use of safety behaviour in CBT. Based on the results, safety behaviour may not necessarily undermine the efficacy of exposure for contamination fear, at least in a brief intervention. Furthermore, there may be specific situations in which safety behaviour may actually facilitate treatment outcome, such as when novel safety aids are incorporated into exposure and when participants/clients control the progression of the exposure session. While preliminary, these results could aid in establishing formal guidelines for the judicious use of safety behaviour in CBT, and inform the development of effective and acceptable treatments for anxiety and related problems.

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Appendix A

Behavioural Approach Test for Study 1

Behavioural Approach Test (BAT)

Step	Behaviour
1	Stand outside the testing room with the door closed
2	Enter the testing room and stand next to the door
3	Approach bedpan within 3 feet
4	Touch top of bedpan with a sheet of tissue
5	Touch inside rim of bedpan with a sheet of tissue
6	Touch directly above bedpan with a sheet of tissue
7	Touch top of bedpan with right index finger
8	Touch inside rim of bedpan with right index finger
9	Touch directly above bedpan liquid with right index finger
10	Touch top of bedpan with right hand
11	Touch inside rim of bedpan with right hand
12	Touch directly above bedpan liquid with right hand
13	Touch top of bedpan with both hands
14	Touch inside rim of bedpan with both hands
15	Touch directly above bedpan liquid with both hands
16	Touch top of bedpan with both hands, then touch arms and chest
17	Touch inside rim of bedpan with both hands, then touch arms and chest
18	Touch directly above bedpan liquid with both hands, then touch arms and chest

Note. Adapted from Cougle, Wolitzky-Taylor, Lee, & Telch, 2007.

Appendix B

Behavioural Approach Test for Study 2

Behavioural Approach Test (BAT)

Step	Behaviour
1	Stand outside the testing room with the door closed
2	Enter the testing room and stand next to the door
3	Approach bedpan within 3 feet
4	Touch top of bedpan with a sheet of tissue
5	Touch inside rim of bedpan with a sheet of tissue
6	Touch directly above bedpan with a sheet of tissue
7	Touch top of bedpan with right index finger
8	Touch inside rim of bedpan with right index finger
9	Touch directly above bedpan liquid with right index finger
10	Touch top of bedpan with right hand
11	Touch inside rim of bedpan with right hand
12	Touch directly above bedpan liquid with right hand
13	Touch top of bedpan with both hands
14	Touch inside rim of bedpan with both hands
15	Touch directly above bedpan liquid with both hands
16	Touch top of bedpan with both hands, then touch arms and chest
17	Touch inside rim of bedpan with both hands, then touch arms and chest
18	Touch directly above bedpan liquid with both hands, then touch arms and chest
19	Touch top of bedpan with both hands, then touch both cheeks
20	Touch inside rim of bedpan with both hands, then touch both cheeks

21	Touch directly above bedpan liquid with both hands, then touch both cheeks
22	Touch top of bedpan with both hands, then touch lips with both hands
23	Touch inside rim of bedpan with both hands, then touch lips with both hands
24	Touch directly above bedpan liquid with both hands, then touch lips with both hands

Note. Adapted from Cougle, Wolitzky-Taylor, Lee, & Telch, 2007.

Appendix C

Informed Consent Forms for Study 1

CONSENT FORM TO PARTICIPATE IN *X MARKS THE SPOT II*

I understand that I have been asked to participate in a research project being conducted by Hannah Levy (ha_levy@live.concordia.ca; 514-848-2424 ext. 5965) under the supervision of Dr. Adam S. 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 a new treatment approach 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

I have been informed that this study will take approximately 3-4 hours to complete. If I agree to participate in this study, I will begin with an interview, in which the experimenter will ask me some questions about anxiety and my everyday experiences. This interview will be audio-recorded for consistency purposes. The audio file will not contain my name or any identifying information. Then, I will be asked to complete a brief questionnaire package, which will take approximately 35 minutes. Following the questionnaire package, I will be asked to approach a contaminant, as close as I am able, and then provide my anxiety rating. After approaching this contaminant, I will be asked to interact with a series of contaminants and to provide my anxiety rating. Following these interactions, I will complete the same questionnaire battery and approach the same contaminant as close as I am able, then provide my anxiety rating. Finally, I will be fully debriefed about the purpose of the study as well as the hypotheses.

C. RISKS AND BENEFITS

I understand that I may become distressed or uncomfortable when asked to approach and/or interact with the contaminants, and when completing questionnaires about my fears and emotions. I understand that my questionnaire data will be collected via the Internet on a Concordia University-based server. These questionnaires ask no questions regarding my name and they will not be connected in any way with my contact details. 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. For my participation, I will be offered $40 OR entry into a cash draw for prizes ranging from $50 to $300. I may also experience a decrease in the severity of my contamination fear as a result of my participation in the study.

D. CONDITIONS OF PARTICIPATION

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 my participation in this study is CONFIDENTIAL. 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 contact Hannah Levy, Department of Psychology, at (514) 848-2424, ext. 5965 or by email at ha_levy@live.concordia.ca; or Adam Radomsky, Department of Psychology, at (514) 848-2424, ext. 2202 or by email at adam.radomsky@concordia.ca.

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 _____

If at any time you have questions about your rights as a research participant, please contact the Research Ethics and Compliance Advisor, Concordia University, 514.848.2424 ex. 7481 ethics@alcor.concordia.ca

CONSENT FORM TO PARTICIPATE IN *X MARKS THE SPOT II*

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 anyone.

Signature _____

Witness _____

Date _____

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 contact Hannah Levy, Department of Psychology, at (514) 848-2424, ext. 5965 or by email at ha_levy@live.concordia.ca; or Adam Radomsky, Department of Psychology, at (514) 848-2424, ext. 2202 or by email at adam.radomsky@concordia.ca.

Appendix D

Informed Consent Forms for Study 2

CONSENT FORM TO PARTICIPATE IN *X MARKS THE SPOT*

I understand that I have been asked to participate in a research project being conducted by Hannah Levy (ha_levy@live.concordia.ca; 514-848-2424 ext. 5965) under the supervision of Dr. Adam S. Radomsky (adam.radomsky@concordia.ca; 514-848-2424 ext. 2202) in the Psychology Department of Concordia University.

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I have been informed that the purpose of this study is to evaluate a new treatment approach 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

I have been informed that this study will take approximately 2 hours to complete. If I agree to participate in this study, I will begin with a questionnaire package. Then, I will meet a trained research assistant who will ask me to approach a contaminant, as close as I am able, and then to provide an anxiety rating. After approaching this contaminant, I will be asked to interact with a series of contaminants and to provide my anxiety rating for each one. Following these interactions, I will complete a second questionnaire battery, then meet the trained research assistant for a second approach and provide my anxiety rating. Finally, I will be fully debriefed about the purpose of the study as well as the hypotheses.

C. RISKS AND BENEFITS

I understand that I may become distressed or uncomfortable when asked to approach and/or interact with the contaminants, and when completing questionnaires about my fears and emotions. I understand that my questionnaire data will be collected via the Internet on a Concordia University-based server. These questionnaires ask no questions regarding my name and they will not be connected in any way with my contact details. 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. For my participation, I will receive the opportunity to submit my name in a draw for cash prizes ranging from $50 to $300, OR 2 course credits if I am part of the undergraduate participant pool at Concordia University. I may also experience a decrease in the severity of my contamination fear as a result of my participation in the study.

D. CONDITIONS OF PARTICIPATION

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 my participation in this study is CONFIDENTIAL. 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 contact Hannah Levy, Department of Psychology, at (514) 848-2424, ext. 5965 or by email at ha_levy@live.concordia.ca; or Adam Radomsky, Department of Psychology, at (514) 848-2424, ext. 2202 or by email at adam.radomsky@concordia.ca.

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 _____

If at any time you have questions about your rights as a research participant, please contact the Research Ethics and Compliance Advisor, Concordia University, 514.848.2424 ex. 7481 ethics@alcor.concordia.ca

CONSENT FORM TO PARTICIPATE IN *X MARKS THE SPOT*

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 the study, please feel free to ask the experimenter now. If other questions or concerns come up following the study, please contact Hannah Levy, Department of Psychology, at (514) 848-2424, ext. 5965 or by email at ha_levy@live.concordia.ca; or Adam Radomsky, Department of Psychology, at (514) 848-2424, ext. 2202 or by email at adam.radomsky@concordia.ca.

Appendix E

Debriefing Form for Study 1

Debriefing

Thank you for your time and cooperation. The purpose of this study is to evaluate the efficacy and acceptability of a new cognitive-behavioural treatment approach for contamination fear. Traditional cognitive-behavioural therapy (CBT) can be very difficult for people with severe 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 acceptable for people with significant fears. We are comparing traditional CBT for contamination fear with CBT that includes safety gear, which are items that might make people feel more comfortable during exposure therapy. Some participants in this study are offered a new kind of safety gear they have never used, some are asked to use a safety gear they already use in their daily lives, and some are not offered any safety gear. We hypothesize that the treatment in which participants use a new kind of safety gear will be most effective compared to CBT with no safety gear and CBT with a routinely-used kind of safety gear. We also hypothesize that the treatments with safety gear will be more acceptable to participants. This is because we think that treatment with safety gear will feel less threatening and anxiety-provoking to participants.

If you have any questions or comments about this study, please contact Hannah Levy (ha_levy@live.concordia.ca; 514-848-2424, ext. 5965) or Dr. Adam Radomsky (adam.radomsky@concordia.ca; 514-848-2424, ext. 2202). 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%20manual%202012.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.

Rachman, S. (2004). Fear of contamination. *Behaviour Research and Therapy*, *42*, 1227-1255.

Rachman, S., Radomsky, A. S., & Shafran, R. (2008). Safety behaviour: A reconsideration. *Behaviour Research and Therapy*, *46*, 163-173.

Appendix F

Debriefing Form for Study 2

Debriefing

Thank you for your time and cooperation. The purpose of this study is to evaluate the efficacy and acceptability of a new cognitive-behavioural treatment approach for contamination fear. Traditional cognitive-behavioural therapy (CBT) can be very difficult for people with severe 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 acceptable for people. This is why you were offered a selection of protective items to use during the exposure session, because we thought these items might make the exposure easier for you. We are also investigating the optimal way to phase out the protective items. In particular, who should decide when to eliminate them, the participant or the experimenter? We are comparing three conditions: one where the participant decides to phase out the protective item; one where the experimenter decides based on the participant's self-reported distress level; and one where the experimenter decides based on a predetermined time point. We hypothesize that the condition in which the participant decides will demonstrate greater treatment efficacy and acceptability than the two experimenter-decides conditions. This is because we think that participants will feel more confident and more in-control when they decide how the exposure session will progress.

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%20manual%202012.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.

Rachman, S., Radomsky, A. S., & Shafran, R. (2008). Safety behaviour: A reconsideration. *Behaviour Research and Therapy*, *46*, 163-173.

Appendix G

Ethics Approval Certificates

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CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Dr. Adam Radomsky

Department: Faculty of Arts and Science\Psychology

Agency: N/A

Title of Project: Experimental Investigations of the Judicious Use of Safety Behavior in Exposure Therapy for Contamination Fear

Certification Number: 30001148

Valid From: June 17, 2013 to: June 16, 2014

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

Dr. James Pfaus, Chair, University Human Research Ethics Committee

Concordia

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Dr. Adam Radomsky

Department: Faculty of Arts and Science\Psychology

Agency: N/A

Title of Project: Experimental Investigations of the Judicious Use of Safety Behaviour in Exposure Therapy for Contamination Fear

Certification Number: 30001148

Valid From: June 27, 2014 to: June 26, 2015

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

Dr. James Pfaus, Chair, University Human Research Ethics Committee