An Examination of Distraction Use in Exposure Therapy for Anxiety

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ABSTRACT

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Individuals often utilize distraction strategies to cope with distress that results from anxiety-provoking situations. While some theories suggest that distraction will impede improvement during exposure, others suggest it may not be harmful, and may in fact aid in fear reduction. Experimental results parallel these divergent theories, with support for distraction both helping and hindering treatment. Given these mixed findings, the goal of these studies was to investigate factors that may help explain the differences observed in the extant literature. In Study 1 a measure of maladaptive beliefs about distraction, the Beliefs about Distraction Inventory (BADI), was developed and validated in an unselected student sample (N = 506) and confirmed in a contamination-fearful sample (N = 132). Results indicated that the BADI was psychometrically sound and consisted of two factors: Distraction is Necessary and Distraction is Effective. This factor structure was confirmed in the contamination-fearful sample, and similar psychometric properties were observed. Study 2 was comprised of two studies that together aimed to assess the impact of differing levels of distraction on exposure outcome. In Experiment 1 verbal distraction tasks were experimentally validated in an undergraduate sample (N = 180) using a reaction time task. Three different levels of distraction were established, categorized as utilizing low, moderate, and high levels of cognitive load. In Experiment 2 the three tasks varying in distraction intensity were compared to a no distraction control during an exposure session with contamination-fearful individuals (N = 124). Changes in behavioural approach did not differ significantly across conditions at post-exposure or at one-week follow-up. However, treatment acceptability was highest in conditions utilizing moderate or high levels of distraction, and changes in self-efficacy were greatest in the moderate distraction condition. Finally, preliminary analyses were conducted to assess the impact of maladaptive beliefs about distraction on exposure outcome. Results showed that high BADI scores were related to less improvement over the course of an exposure session when moderate distraction was utilized.

The results of these studies are discussed in terms of theoretical and clinical implications, including the cognitive-behavioural treatment of anxiety and related disorders.

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CONTRIBUTION OF AUTHORS

The following thesis is comprised of two manuscripts and one supplemental study:

Study 1 (Chapter 2)

Senn, J. M., & Radomsky, A. S. (in press). Measuring beliefs about distraction: Might the function of distraction matter more than distraction itself? *Cognitive Therapy and Research.* doi:10.1007/s10608-015-9703-7

Study 2 (Chapter 4)

Senn, J. M., & Radomsky, A. S. (under review). *Too little, too much, or just right? Does the amount of distraction make a difference during contamination-related exposure?* Manuscript submitted for publication.

Supplemental Study (Chapter 5)

Senn, J. M., & Radomsky, A. S. (in preparation). *Impact of beliefs about distraction on exposure outcome.* Manuscript in preparation for publication.

I was responsible for the selection of the content of this program of research, and for the conceptualization of each of the three studies (and one supplemental study) that comprised this body of work. Two of the studies I conducted have been combined into one manuscript (Study 2) for publication purposes; these two experiments within Study 2 will henceforth be referred to as the Task Validation Study (Experiment 1) and the Experimental Study (Experiment 2). I was responsible for carrying out all aspects of the research, including developing research questions and hypotheses, study design, statistical analyses, and writing the dissertation. Participant recruitment, scheduling, and testing were typically carried out in conjunction with thesis students and student volunteers (see below for details). I met regularly with my supervisor Dr. Adam Radomsky for consultation and supervision related to study design and hypotheses, data analyses, interpretation, and written results. My committee members, Drs. Michel Dugas and Roisin O'Connor, provided helpful feedback and suggestions related to study design and statistical plans during my proposal meeting.

For Study 1, I obtained feedback about proposed items for the questionnaire from members of the Anxiety and Obsessive Compulsive Disorders Laboratory during a lab meeting. I developed the remainder of the questionnaire, created the online forms for data collection, and

created and managed the databases. For data collection for the unselected student sample used for the exploratory factor analysis, I was assisted by an undergraduate volunteer (Michael Lacoursiere). This volunteer sent links to participants who signed up for the study through the online participant pool, and later assigned credits after the survey had been completed. He also contacted a subset of the sample for retest. The contamination-fearful sample used in the confirmatory factor analysis was extracted from the Experimental Study of Study 2 (please see below for details regarding who was involved in this study). I was principally responsible for data cleaning and analyses, as well as writing the manuscript associated with this study.

Study 2 was comprised of two separate experiments: the Task Validation Study and the Experimental Study. For the Task Validation Study, I developed the tasks in consultation with Dr. Adam Radomsky, and was responsible for study design, research questions, and hypotheses. A research assistant (Kevin Barber) assisted in programming the majority of the reaction time task in Inquisit, and I made the final adjustments. I tested approximately 75% of the participants using the experimental protocol I developed, and the other 25% were tested by an honours thesis student (Joelle Soucy) who I trained. For the Experimental Study, I was responsible for the research questions, hypotheses, and study design, and met with Dr. Adam Radomsky to consult as necessary. Study recruitment and scheduling was completed over the phone with the assistance of two undergraduate volunteers (Sarah McIlwaine and Delphine DiTecco). The volunteers and I shared these duties, each likely conducting approximately one third of the phone screening and scheduling. These two volunteers were also responsible for data entry. Four volunteers (Sarah McIlwaine, Sasha MacNeil, Delphine DiTecco, and Sarah Burrows) and one research assistant and former honours student (Joelle Soucy) assisted with data collection. Their role was to guide participants through a behavioural approach test and ask related questions at three separate time points in the study. I completed the remainder of the experimental protocol independently. A volunteer (Sarah Burrows) completed coding for information related to previous treatment, and another volunteer (Edmine Serulien) coded audio recordings for both a manipulation check for condition assignment, and also to assess for instances of requests to proceed during the exposure session. I was principally responsible for data cleaning and screening, analyses, interpretation, and writing a draft of this manuscript.

The supplemental study presented in Chapter 5 utilized the same design and sample as the Experimental Study of Study 2 detailed in the previous paragraph. Therefore, the

contributions parallel those listed above. Unfortunately, given that this is a manuscript-style thesis we were unable to include the content of this chapter within the manuscript presented in Chapter 4 (due to length). As such, it is presented in its own supplemental section of this dissertation.

I wrote all remaining components of this dissertation. For all written components (manuscripts included), I incorporated feedback provided by Dr. Adam Radomsky. Study 1 underwent a blind review for publication in a peer-reviewed journal. Therefore, feedback from anonymous reviewers was incorporated in the final version of the Study 1 manuscript (now in press) that is presented in this thesis. Study 2 (comprised of two experiments) has been submitted to a peer-reviewed journal and is currently under review. The supplemental study (Chapter 5) is in preparation to be submitted to a peer-reviewed journal at a later date.

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CHAPTER 1

General Introduction

With lifetime prevalence rates estimated at 29% (Kessler et al., 2005), anxiety disorders are among the most common mental disorders. Not only are anxiety disorders common, but they are also often debilitating, resulting in markedly decreased quality of life and reduced psychosocial functioning (e.g., Mendlowicz & Stein, 2000; Olatunji, Cisler, & Tolin, 2007; Rapaport, Clary, Fayyad, & Endicott, 2005). Additionally, significant impairment in daily functioning has been observed even in individuals with subclinical levels of anxiety (Mendlowicz & Stein, 2000), further highlighting the impact of anxiety symptoms on everyday life. Fortunately, a number of effective treatments for anxiety disorders exist. For example, cognitive behaviour therapy (CBT) has been well-established as an effective evidence-based treatment for anxiety disorders (e.g., Butler, Chapman, Forman, & Beck, 2006; Hofmann & Smits, 2008) that has been shown to be more effective than psychotropic medication (e.g., Hofmann & Smits, 2008). Most cognitive-behavioural treatments involve at least some component of exposure, where individuals confront situations or stimuli that cause them anxiety; however, there is ongoing debate about how best to implement exposure in treatment. For example, the importance of focused attention (versus distraction), dropping safety behaviours, experiencing significant fear reduction, and sequentially progressing through a hierarchy of feared situations have all received recent attention (e.g., Craske, Treanor, Conway, Zbozinek, & Vervliet, 2014; Parrish, Radomsky, & Dugas, 2008; Podină, Koster, Philippot, Dethier, & David, 2013). The current research program focused on the use of distraction during exposure. Specifically, the impact of distraction use was examined in the context of both exposure outcome and treatment acceptability.

Individuals often resort to the use of distraction strategies in order to cope with negative emotions including anxiety (e.g., Werner & Gross, 2010; Rothbart & Sheese, 2007), one of many emotion regulation skills that are acquired early in development (Kopp, 1989). Distraction has been conceptualized as any action that removes attentional focus from the experience of anxiety or from the stimulus or situation that is causing anxiety (e.g., Sy, Dixon, Lickel, Nelson, & Deacon, 2011), thus acting as a form of escape or avoidance. Distraction can take many forms which can be classified more generally as either visual or cognitive distraction or more specifically by the exact distraction strategy utilized (e.g., imagining being elsewhere, counting,

or making lists), including inward versus outward distraction (see Podină et al., 2013). Although distraction exists in many forms, the typical function of utilizing distraction relates to reducing negative emotions such as depression, disgust, guilt, and anxiety (see Werner & Gross, 2010). However, the current research program focuses on the use of distraction in the context of anxiety. Given that distracting oneself may lead to reduced attention allocated to the anxiety-provoking stimulus or situation in addition to reduced anxiety, its use in the context of exposure therapy for anxiety has received scientific scrutiny.

Exposure is an effective component of cognitive-behaviour therapy based on behavioural theory which involves repeated and prolonged exposure to feared objects or situations (e.g., Abramowitz, Deacon, & Whiteside, 2011). When individuals stay in the presence of something that makes them anxious and do so repeatedly, they learn that the outcome they fear does not occur, which leads to subsequent decreases in anxiety and fear. Initial conceptualizations of exposure were based on habituation/extinction models: when exposed to feared stimuli that are objectively safe, an initial increase in anxiety will be followed by a gradual decrease in anxiety, with repeated trials leading to lower initial levels and more rapid reduction of anxiety (e.g., Groves & Thompson, 1970; Rachman, de Silva, & Roper, 1976; Soloman, Kamin, & Wynne, 1953). Early work on the use of exposure in the treatment of anxiety disorders focused on systematic desensitization, which involved imaginal exposure to feared stimuli while concurrently experiencing a state of relaxation, purportedly leading to reciprocal inhibition (Wolpe, 1958). Habituation-based models without the use of relaxation later became the dominant mechanism proposed to drive exposure therapy (e.g., Lader & Mathews, 1968; Watts, 1979). For example, in experimental work by Meyer (1966), individuals with obsessive-compulsive disorder were exposed to their fears and then prevented from completing their typical compulsions (i.e., exposure and response prevention) with the goal of modifying expectations of danger. This habituation-based treatment required patients to sit with their anxiety until it subsided, without taking specific actions to reduce their anxiety, and without the use of relaxation strategies that had been incorporated in earlier exposure-based treatments. Following Meyer's work, the use of exposure for a broad range of anxiety-related difficulties continued and has been developed further over time (see Rachman, 2015).

While exposure had often been viewed as a behavioural treatment primarily based on fear habituation, the importance of targeting cognition was soon recognized (e.g., Clark, 1986;

Salkovskis, 1985). Cognitive theories have further proposed fear disconfirmation as an important mechanism in exposure (e.g., Clark, 1999; Salkovskis, 1991). Therefore, exposure likely works via both cognitive and behavioural mechanisms. However, given the proposed importance of the experience of anxious arousal (and reductions in anxiety) in successful exposure (as outlined by behavioural theory), the use of distraction during exposure is often discouraged.

One theory suggesting that the use of distraction may interfere with treatment is that of emotional processing. Although the term "emotional processing" was first utilized by Rachman (1980), it followed work by Lang (1977, 1979) that proposed a model for how emotional information is stored, processed, and organized, including the presence of fear structures (later expanded by Foa & Kozak, 1986; see below). Emotional processing refers to experiencing an emotional disturbance and successfully "absorbing" this experience in a manner that does not impact future behaviour or negatively colour future experiences (Rachman, 1980). Accordingly, a failure to adequately process a troubling event during or after its occurrence is proposed to lead to emotional difficulties. It is suggested that successful therapy must incorporate proper emotional processing, such that fear-related cues no longer elicit a fearful reaction. Given that this theory focuses on the importance of experiencing emotional arousal, emotional processing is thought to be stunted by stimulus avoidance or a lack of autonomic response. Distraction techniques that reduce or remove focus from the feared stimulus or are effective in reducing autonomic response are therefore seen as impediments to successful emotional processing. Accordingly, the recommendation put forth by Rachman (1980) states that minimizing distractions will promote ample emotional processing.

The emotional processing theory was extended by Foa and Kozak (1986) to address potential mechanisms related to fear processing. They proposed that fear is represented in memory structures that influence fear-related behaviour, and that therapy can aid in altering or modifying these memory structures. Specifically, in order for fear reduction to occur during exposure, the relevant fear structure must be activated and then altered through integration of new information that is incompatible with the existing fear structure content. Foa and Kozak (1986) emphasize the importance of physiological arousal during exposure and suggest that cognitive avoidance (i.e., distraction) will interfere with this process by decreasing encoding and the integration of fear-relevant information. This implies that full immersion in the exposure

experience is recommended for optimal fear reduction, and that distraction does not allow for full immersion to occur.

Others have postulated that an important factor for fear reduction is attentional focus. Early research on desensitization (which involves imagining feared objects or scenes) found that re-describing the object or scene during each exposure (i.e., re-focusing attention on the details) was more effective in reducing return of fear than simply asking individuals to re-imagine the object or scene (Watts, 1974). It has similarly been suggested that active engagement with a stimulus during exposure is a necessary condition for extinction (Borkovec, 1982), and that insufficient attentional focus will interfere with emotional processing during exposure (Barlow, 1988). Importantly, Borkovec and Grayson (1980) noted that exposure to a stimulus does not necessarily mean that functional exposure has occurred (i.e., attention to the stimulus is also necessary). This proposed distinction is important because individuals may theoretically complete an exposure exercise but not be completely immersed in the experience due to a lack of attention, which may lead to reduced improvement in treatment. In summary, attention, and more specifically cognitive attention or a focus on the details of a feared situation or stimulus, has been suggested as an important and optimal condition for fear reduction. Consequently, any action that interferes with these conditions is proposed to negatively impact fear reduction (e.g., Watts, 1974).

Another theory that has proposed negative implications for distraction use is the inhibitory learning theory put forth by Craske and colleagues (e.g., Craske et al., 2008; Craske, Liao, Brown, & Vervliet, 2012; Craske, Treanor, Conway, Zbozinek, & Vervliet, 2014). Inhibitory learning theory suggests that previous associations between stimuli and fearful reactions do not necessarily need to be altered (as suggested by emotional processing theory), but instead new associations need to be built that will compete with pre-existing memories (e.g., Craske et al., 2008; Craske et al, 2012; Craske et al., 2014). As these new associations are learned in a number of contexts and spaced over time, they will be more easily retrieved than former fear-related associations, thus leading to decreased fear (e.g., Craske et al., 2008). In order for inhibitory learning (also referred to as "safety learning") to occur, new associations need to be learned in conditions where "conditioned inhibitors" (i.e., actions that are taken to achieve safety in a situation) are not utilized. For example, if an individual performs specific actions aimed to achieve safety, such as having someone with them, carrying medications, or

using hand sanitizer, any new associations that are created will include this "conditioned inhibitor" as a safety signal, and thus will not allow learning that can effectively counteract the initial fear association (Craske et al., 2008). This could theoretically relate to distraction if the lack of a negative outcome is attributed to the use of distraction. More importantly, it is proposed that awareness of both the feared stimulus and the non-occurrence of a feared outcome (or fear response) are required for inhibitory learning to occur; therefore, distraction is considered harmful due to reduced ability to attend to the potentially absent link between a feared stimulus and a feared outcome or fear response (Craske et al., 2014). Consequently, it is suggested that distraction interferes with inhibitory learning and should be discouraged during exposure.

In line with the aforementioned theories, it is often suggested that clients refrain from utilizing distraction techniques in the context of treatment. This suggestion reflects the proposal that distraction impedes progress during exposure (e.g., Clark et al., 2006; Foa & Kozak, 1986) and that distraction amplifies the probability of the return of fear (e.g., Boschen, Neumann, & Waters, 2009). On the other hand, distraction strategies are often encouraged and implemented in clinical practice to help individuals more easily approach feared situations or stimuli (e.g., Craske, Street, & Barlow, 1989; Salkovskis, 1991). In addition to the fact that distraction is often encouraged in clinical practice, many individuals without diagnosable anxiety disorders use strategies such as distraction to cope with the occurrence of anxiety (or other negative emotions), an adaptive response that does not appear to lead to negative long term consequences or difficulties unless it becomes chronic (e.g., Campbell-Sills & Barlow, 2007; Hunt, 1998). This further suggests that the use of such techniques may not inherently lead to negative consequences, but that there may be specific elements of anxiety control strategies that are important to consider in clinically anxious individuals (e.g., Parrish, Radomsky, & Dugas, 2008).

Salkovskis (1991) emphasized that continual avoidance of or escape from anxiety-provoking situations results in an inability to disconfirm threat-related fears, acting as a maintenance factor for anxiety disorders. Specifically, actions aimed to prevent feared catastrophic outcomes do not allow individuals to learn about the actual safety of the situations or stimuli they encounter, as safety is often attributed to these actions (e.g., Clark, 1999; Salkovskis, 1991). While Salkovskis (1991) suggests that such safety-seeking behaviours interfere with fear reduction, he also emphasizes that these behaviours will have detrimental

effects when the intention of the behaviour is to prevent disastrous outcomes. It is thus proposed that adaptive coping-related responses that aim to reduce anxiety in a situation do not follow this pattern (Salkovskis, 1991; Salkovskis, Clark, & Gelder, 1996): they are not performed to prevent catastrophic outcomes, and thus do not necessarily prevent fear disconfirmation. Of course, it is possible that in cases where physiological arousal is the fear (e.g., in individuals with panic disorder), distraction may in fact be aimed at preventing negative outcomes, and thus may be considered detrimental to treatment. However, given that in most cases distraction does not primarily serve as a means to prevent negative outcomes but rather aims to reduce anxious arousal, it is not predicted that distraction will necessarily interfere with fear reduction. Indeed, it has been suggested that the feared outcome an individual is avoiding, and thus the intention behind the use of anxiety-reducing strategies, may be a more important consideration than simply whether such techniques are employed. Furthermore, the use of anxiety reduction techniques may in fact aid in cognitive change given that the use of these strategies often allows for the occurrence of non-catastrophic outcomes (e.g., Salkovskis, Clark, Hackmann, Wells, & Gelder, 1999). This cognitive perspective supports the notion that distraction may not in fact impede improvement during exposure. However, this also raises the important question of how to accurately distinguish between adaptive coping and maladaptive avoidance (e.g., Thwaites & Freeston, 2005).

Distraction strategies specifically aimed at controlling anxiety have been utilized in the context of anxiety management treatments (i.e., encouraged in some clinical contexts), yet have alternatively been labeled as problematic behaviour that needs to be reduced in the context of treatment, a puzzling discrepancy that has raised theoretical questions (e.g., Parrish, Radomsky, & Dugas, 2008; Salkovskis, 1991, 1996). Specifically, it is curious that the same action can be conceptualized as helpful by some, and alternatively viewed as an avoidance strategy that needs to be eliminated by others. One potentially important factor relates to understanding the purpose or function a specific strategy is serving; it has been suggested that this distinction may aid in distinguishing between adaptive and maladaptive strategies. Specifically, for behaviours utilized to cope with anxiety, it has been suggested that the exact behaviour may not be as important as the function it serves for the individual or why they decided to utilize such behaviour (e.g., Helbig-Lang & Petermann, 2010; Thwaites & Freeston, 2005). Theoretically there is a distinction between coping strategies that are adaptive, and therefore do not impact long-term

improvement, and those which may interfere with long-term gains and thus are encouraged to be dropped over the course of treatment. As mentioned previously, strategies that may hinder long-term improvement are those that are aimed at preventing feared catastrophes, but may also include overuse and reliance upon seemingly adaptive coping strategies (Thwaites & Freeston, 2005). Furthermore, considering the potential importance of context, the same behaviour employed in two different situations may serve a different purpose on each occasion, and may be adaptive in one case and maladaptive in another. In summary, distraction is often used as a coping strategy that may be viewed as adaptive, but its overuse, use in certain situations, or reliance upon distraction may indeed lead to its characterization as a maladaptive avoidance strategy.

Another theory that supports the notion that distraction may not in fact be harmful to exposure outcome relates to Bandura's self-efficacy theory. Specifically, Bandura (1977, 1988) proposed that fear reduction and symptom improvement can occur via increased self-efficacy (i.e., a sense of mastery over a situation or sense of accomplishment associated with task completion). Theoretically, when an individual conquers a task they initially perceived as difficult (e.g., completing a challenging exposure), the associated sense of accomplishment and achievement will bolster symptom reduction. Gaining a sense of mastery over conquering fears may also encourage enhanced willingness to complete later exposure exercises. Therefore, the mere completion of potentially difficult tasks may lead to increased self-efficacy, which theoretically could occur across a range of exposure conditions. Indeed, increases in self-efficacy predict psychological change (e.g. Jones & Menzies, 2000; Zoellner, Echiverri, & Craske, 2000), further supporting the importance of self-efficacy to treatment outcome. Importantly, individuals tend to assess how well they coped in a given situation based on their level of physiological arousal; therefore, arousal-reducing techniques such as distraction may play a role in further enhancing self-efficacy (Bandura, 1977, 1988). It is therefore proposed that distraction techniques may not interfere with exposure and may in fact aid in reducing physiological response, thereby allowing for greater increases in self-efficacy.

Reducing physiological response in the context of exposure has been highlighted in other areas of psychological treatment research. Specifically, early treatments for anxiety disorders were conducted using systematic desensitization, which involved imaginal exposure to feared situations and stimuli while also inducing a state of relaxation, supposedly leading to reciprocal

inhibition (e.g., Wolpe, 1958). It was proposed that the use of relaxation strategies in conjunction with exposure to feared stimuli would create a response that is incompatible with an individual's expectations in their feared situation (i.e., being relaxed while imaging one's greatest fear). In this case, the individual learns both that they can cope in once-anxiety-provoking situations, and that the ability to be relaxed in the situation is indicative of a lack of objective danger. It is therefore unsurprising that relaxation or calming techniques have often been proposed as methods that can increase emotional processing and exposure outcome (e.g., Rachman, 1980). Furthermore, given that emotional processing theory states that exposure will not be effective if physiological arousal is excessively high, relaxation has been proposed to be helpful in exposure via increasing attention and decreasing arousal (Foa & Kozak, 1986). Overall, the use of strategies that induce relaxation are purported to be useful in the context of exposure in anxiety. Although these same theories suggest against the use of distraction due to insufficient attentional resources or incomplete emotional processing, it is possible that the potential relaxation-inducing role of distraction was not fully considered in these initial conceptualizations. It is also possible that relaxation may be helpful only when certain levels of distress or anxiety are present, but not at other levels of distress. For example, perhaps relaxation strategies are optimal when distress is high in order to help individuals be able to engage in exposure, whereas if distress is already low, relaxation may lead to their anxiety decreasing to a level where conducting exposure is no longer warranted due to the lack of a fear reaction. Therefore, the aforementioned theories may shed some light on when relaxation or distraction may be useful, but more remains to be understood about the impact of using distraction when experiencing different levels of distress.

Others have suggested that certain strategies used to control anxiety may not be as detrimental as once thought. For example, in a review of the literature related to anxiety control strategies, Parrish, Radomsky, and Dugas (2008) suggested that the use of such strategies is unlikely to be counterproductive if the strategy utilizes minimal attentional resources, enhances self-efficacy (for example through relaxation or increased cognitive change), enables belief disconfirmation through disconfirmatory experiences, and does not lead to misattributing safety in the situation to the strategy utilized. In this review, a number of hypotheses were presented regarding the use of distraction during exposure, some of which parallel the theories mentioned above. For example, it was suggested that the use of distraction techniques that increase

relaxation might be useful whereas distraction strategies that increase arousal (e.g., through excitement or frustration) may be detrimental, and that moderate levels of distraction may not induce a sense of relaxation or increased anxiety, and thus may not impact outcome.

Another hypothesis proposed by Parrish, Radomsky, and Dugas (2008) relates to the cognitive load of distraction tasks, and is based on the notion that more distracting tasks are likely to reduce the amount of cognitive resources remaining to attend to and process the exposure (e.g., Telch et al., 2004). It is suggested that a certain optimal level of attentional resources may need to be focused on the feared stimulus or situation in order for fear reduction to occur. Specifically, high levels of attention to a feared stimulus or situation may lead to increased threat perceptions and anxiety reactions, while if minimal attention is available to be directed toward a feared stimulus this may inhibit fear reduction due to a lack of cognitive resources remaining to emotionally process the exposure (see Johnstone & Page, 2004; McNally, 2007; Telch et al., 2004). Overall, while distraction and other anxiety control strategies may have the potential to negatively impact treatment, it is likely that under certain conditions these techniques may actually be helpful, and indeed aid in fear reduction (Parrish, Radomsky, & Dugas, 2008). It is further proposed that the use of safety-seeking strategies will only be harmful if they preclude fear disconfirmation, and that the use of such strategies in the early stages of treatment may in fact facilitate fear reduction while also reducing high levels of treatment refusal and drop out (Rachman, Radomsky, & Shafran, 2008).

Overall, although distraction has historically been viewed as a potential obstacle to progress in exposure-based treatments due to reduced attentional focus and subsequent interruptions in emotional processing, there are also a number of theories that support the notion that distraction may not necessarily be detrimental to exposure outcome. These theories suggest a number of different possibilities to explain why distraction may not be as disadvantageous as was once suggested, including the possibility that fear disconfirmation remains possible when distraction is utilized, that self-efficacy (which has been implicated in favourable exposure outcome) may increase as a result of the use of distraction, and that distraction may function in a manner more similar to adaptive coping than to maladaptive avoidance of feared stimuli or situations.

Consistent with contrasting theories regarding the potential impact of distraction on exposure outcome, discrepant findings have been observed across experimental investigations of

distraction use. Specifically, while some studies show detrimental effects associated with the use of distraction during exposure (e.g., Craske, Street, & Barlow, 1989; Grayson, Foa, & Steketee, 1982; Haw & Dickerson, 1998; Kamphuis & Telch, 2000; Rodriguez & Craske, 1995), others show that distraction aids in exposure (e.g., Craske, Street, Jayaraman, & Barlow, 1991; Garcia-Palacios et al., 2007; Grayson, Foa, & Steketee, 1986; Johnstone & Page, 2004; Oliver & Page, 2003, 2008; Penfold & Page, 1999), and others show no differences in exposure outcome when distraction is or is not utilized (e.g., Antony et al., 2001; Rose & McGlynn, 1997; Wood & McGlynn, 2000). To illustrate the types of studies and varied results in the distraction literature, selected examples are presented below.

In a study conducted by Antony and colleagues (2001), individuals diagnosed with spider phobia ($N = 60$) underwent two hours of exposure. In the first hour, participants were randomly assigned to either focus their attention on the feared stimulus (focused condition) or to listen to an audio recording about world geography (distraction condition). In the second hour, all individuals completed uninstructed exposure (in order for all participants to additionally receive treatment as usual). Behavioural approach tests were completed prior to exposure, and following completion of both the first and second hour of exposure. Results indicated no significant difference between distracted versus focused exposure, both following the first hour of exposure (when the experimental manipulation occurred) and following the full two hours of exposure. Therefore, the use of distraction did not interfere with fear reduction during exposure. While the authors raised the concern that the selected distraction task may not have been sufficiently distracting, they were able to show that individuals in the distraction condition were paying attention to the audio recording.

In another study, Oliver and Page (2003) recruited a subclinical sample of individuals with blood-injection-injury fears ($N = 48$) who were randomly assigned to complete exposure with distraction, with attentional focus, or exposure alone. In this case, the distraction task consisted of a conversation about neutral topics, and the focused attention task involved the participant providing verbal descriptions of the exposure stimuli (a syringe containing stage blood and two gruesome photographs, displayed on and surrounding a computer screen). Three separate 10-minute exposure sessions were conducted over consecutive weekly visits. In order to maintain visual attention on the feared stimuli, participants also responded to cues on the computer screen where the feared images were displayed. Results indicated that the distraction

condition was associated with the greatest fear reduction both within and between sessions (and at one month follow-up) when compared to focused attention and exposure alone.

Another study aimed to investigate the impact of distraction on exposure specifically through the use of a high level of distraction. Telch and colleagues (2004) recruited participants with high levels of claustrophobic fear ($N = 60$) who were randomly assigned to one of four conditions: attention to threatening words, attention to neutral words, distraction, or exposure alone. The distraction task was a modified Seashore Rhythm Test which consisted of identifying whether pairs of auditory tones were the same or different; this task is known for requiring a large amount of information processing resources. The exposure took place in a claustrophobia chamber and consisted of multiple short exposures (five minutes maximum) separated by three minute breaks. Participants completed as many short exposure exercises as were necessary to allow 30 minutes of exposure. Results indicated that at post-exposure the distraction condition fared worse than all other conditions (exposure alone and both attention conditions), and this effect was greater for between-exercise habituation than fear level during exposure. Given that the task utilized in this study was cognitively demanding, the authors concluded that the amount of cognitive resources necessary to complete a distraction task may be an important consideration. Specifically, it was proposed that the distraction task interfered with threat disconfirmation through reducing the ability to process exposure-relevant information.

Although the aforementioned examples only provide a brief overview of the distraction studies that have been conducted, they are illustrative of the differences seen across studies. Indeed, an early review of studies investigating the impact of distraction on exposure outcome identified inconsistent results (Rodriguez & Craske, 1993). It was suggested that the use of differing forms of distraction and vast differences in experimental paradigms may be in part responsible for conflicting results. For example, they observed inconsistencies in the amount of attentional resources required to complete distraction tasks, the type of attention utilized (e.g., cognitive, visual, or tactile), and the level of affect related to the distraction task. It was therefore proposed that more consistent paradigms need to be explored to better ascertain the role of distraction in exposure. Although the conclusions of this review remain informative, numerous additional investigations of distraction use have been conducted since its completion. However, a recent meta-analysis described similarly inconsistent findings across studies (Podină et al., 2013). It is important to note that this meta-analysis did not include all distraction-related

studies: analyses were restricted to investigations that were conducted with individuals with specific phobia (or analogue specific phobia samples) that also employed a between-subjects design. Analyses showed no differences between focused or distracted exposure when considering distress level or physiological reactions, but for behavioural outcome measures exposure with distraction was more effective than focused exposure, particularly at follow-up assessments.

A number of factors related to distraction use may impact outcome, which may explain the vast differences in results across studies (e.g., Podină et al., 2013; Rodriguez & Craske, 1993). These factors include (but are not limited to) individual differences (e.g., coping style, personality), experimental design (e.g., type of distraction [level of distraction intensity, affective valence, type of attention required], length of exposure, outcome measures, instructions), and the nature of the problem being investigated (e.g., type of anxiety disorder or analogue sample being used). For example, moderation analyses conducted during a meta-analysis of distraction studies indicated that improvement in both behavioural approach and reported distress were more robust when distraction tasks were interactive, and if the exposure took place over multiple sessions (Podină et al., 2013). The results of this meta-analysis provide important insight regarding factors that may relate to when distraction may be useful in exposure, but many additional factors remain unexplored. It is important to continue evaluating when, how, and for whom distraction may be a useful technique in the context of exposure therapy. However, it is not feasible to concurrently address many factors in a single experimental study; therefore, the purpose of the current research program was to better understand the impact and importance of a small subset of these factors on exposure outcome and treatment acceptability.

One area that has yet to be addressed (to this author's knowledge) relates to the beliefs an individual holds about distraction use, and more specifically the level of importance placed on being able to utilize distraction when anxious. Indeed, Rodriguez and Craske (1993) hypothesized that coping style (i.e., preferred or typical methods of dealing with anxiety) may have more of an impact on exposure outcome than whether or not distraction is used during exposure. Furthermore, although they were referring to a broad range of safety-seeking behaviours, Thwaites and Freeston (2005) proposed numerous factors that may determine whether behaviours are maladaptive or could be considered adaptive coping, including the intention behind the act. In other words, a behaviour may be considered maladaptive if the

purpose is to protect the individual, or if they are reliant on the strategy. They also suggested that frequency of use may play an important role, and that consistent use (i.e., reliance) may be indicative of a maladaptive coping strategy. This highlights the importance of understanding the idiosyncratic beliefs an individual holds about the role distraction plays in coping with anxiety-provoking situations.

In addition to factors specifically related to distraction, the importance of targeting beliefs more generally is often viewed as essential to treatment. Thoughts and beliefs play a central role in the cognitive model of anxiety disorders (e.g., Beck, 1976), and remain an important target in the cognitive-behavioural treatment of a range of anxiety and related disorders (e.g., Clark & Beck, 2010; Shafran, Brosan, & Cooper, 2013). In fact, research groups have been formed specifically with the goal of understanding the importance of cognitions, for example in obsessive-compulsive disorder (OCD; e.g., the Obsessive-Compulsive Cognitions Working Group; OCCWG, 1997). Furthermore, many researchers have focused on further evaluating specific belief domains within disorders, and incorporating these beliefs in treatment (e.g., maladaptive beliefs about memory in OCD; Alcolado & Radomsky, 2015). Being able to accurately identify and target beliefs in the context of treatment, especially those that may be interfering with treatment progression, is likely important to both symptom improvement and sustained treatment gains. Furthermore, behavioural experiments, an intervention technique that involves testing specific beliefs with targeted experiments, have become a well-used and effective component of cognitive-behavioural therapy (e.g., Bennett-Levy et al., 2004; McMillan & Lee, 2010), providing further support for the importance of targeted belief change during treatment. A focus on measuring beliefs about distraction may thus be an important area of study that may allow these beliefs to be targeted more specifically in the context of behavioural experiments in treatment.

Another important factor is one which has been noted in the distraction literature but not directly assessed, namely the amount of cognitive load or attention required to complete a distraction task. The amount of attentional resources required to complete a distraction task has received theoretical attention (e.g., Johnstone & Page, 2004; Parrish, Radomsky, & Dugas, 2008; Rodriguez & Craske, 1993) and has emerged as a factor to consider in experimental studies (e.g., Kamphuis & Telch, 2000; Rodriguez & Craske, 1995; Telch et al., 2004). Although Telch and colleagues (Kamphuis & Telch, 2000; Telch et al., 2004) highlighted the potential detrimental

effects of distraction tasks with high cognitive demand, they utilized distraction tasks with high levels of demand but did not compare multiple levels of distraction. To this author's knowledge, varied levels of attentional resources have not been successfully compared in a single study.

One study attempted to manipulate levels of distraction by comparing the impact of viewing highly affective images (categorized as "high distraction"), neutral images (categorized as "low distraction"), or completing no distraction task (Rodriguez & Craske, 1995). The hypothesis was that images containing emotional content would be more distracting and utilize more attentional resources than viewing neutral images. While on the surface it may appear that distraction level could be effectively manipulated through the use of different images, participants in both distraction conditions were provided with explicit instructions to "focus on the slides as much as possible" and to "try to remember as many details as you can about each slide, as you will be tested on them later" (Rodriguez & Craske, 1995, pp. 341). Unsurprisingly, differences in attentiveness to the images were not observed between the high and low distraction conditions, likely due to reduced impact of the affective level of the images when equally high importance was placed on attention to the images in both conditions. Therefore, the authors combined these two conditions into a single distraction condition and were subsequently unable to evaluate potential differences in outcome related to distraction intensity. Although some issues arose regarding the manipulation of distraction levels in this study, the importance of investigating level of distraction in exposure was underlined. Specifically, the amount of attention allocated to the exposure experience will depend in part on the amount of cognitive resources being utilized by other tasks. Completing concurrent tasks that draw attention away from the exposure experience may impede improvement, which may be due to insufficient emotional processing (e.g., Foa & Kozak, 1986), or an inability to attend to information necessary for threat disconfirmation (e.g., Craske et al., 2014; Telch et al., 2004). Importantly, it is possible that low and moderate levels of distraction may not interfere with exposure outcome, whereas high levels of distraction may have a negative impact (for more detail, see Chapter 4).

In addition to understanding the role of differing levels of distraction on exposure outcome, it is important to investigate the impact distraction use might have on perceived acceptability of treatment. Given that treatment refusal and drop-out rates are high (e.g., 44% drop-out rate, Bados, Balaguer, & Saldaña, 2007; combined treatment refusal and drop-out rate 43%, Foa et al., 2005), it is necessary to elucidate treatment variables that may encourage

individuals to begin or complete treatment. Although there are many possible ways to attempt to increase treatment acceptability, the use of safety behaviour (which often includes distraction) in the initial phases of treatment may allow individuals to feel somewhat less anxious and therefore more willing to engage in exposure (e.g., Parrish, Radomsky, & Dugas, 2008; Rachman, Radomsky, & Shafran, 2008). While treatment acceptability has been investigated in relation to overt forms of safety behaviour (e.g., safety gear; Levy & Radomsky, 2014), it has yet to be investigated in the context of covert safety behaviour (e.g., distraction).

The research program described below aimed to investigate and clarify the role of potential factors that may be responsible for discrepant findings in the extant literature on distraction use in exposure, and to investigate the impact of distraction on treatment acceptability. The presented studies include the development of a measure to assess maladaptive beliefs about distraction, and an experimental investigation of the impact of different validated levels of distraction on exposure outcome and other treatment-relevant variables (e.g., self-efficacy, treatment acceptability; see Chapter 4). The availability of a measure to assess maladaptive beliefs about distraction has important clinical implications, and will aid in more accurate assessment of the impact of these beliefs on exposure outcome, both with and without distraction use (see Chapter 5). Additionally, experimental evaluation of the cognitive load associated with different distraction tasks followed by an examination of the impact of these distraction tasks during an exposure session will provide important insight into the impact of variable amounts of distraction on exposure outcome. This will aid in clarifying the role of cognitive load, which has the potential to further our understanding of the discrepant findings in the distraction literature. Given that there is disagreement regarding whether distraction may be beneficial or detrimental during exposure, an investigation of relevant factors that differ across existing investigations will be informative and begin to clarify our theoretical understanding and possible treatment recommendations.

CHAPTER 2

Measuring Beliefs about Distraction: Might the Function of Distraction Matter More than Distraction Itself?

Distraction, or mentally distancing oneself from an expected focus of attention, is a strategy that many people use in anxiety-provoking situations (or more generally, to cope with a range of negative emotions). Historically, distraction use has been proposed to have a negative impact on exposure outcome during cognitive-behaviour therapy (CBT). For example, Foa and Kozak's (1986) emotional processing theory of fear reduction suggests that a fear structure must be activated in order for exposure to be effective, and that distraction will block this fear structure from being fully activated due to a lack of focused attention on the feared stimulus. From a cognitive perspective, distraction could be construed as a possible barrier or hindrance to the acquisition of disconfirmatory information (Parrish, Radomsky, & Dugas, 2008). Overall, it is suggested that the use of distraction when anxious interferes with exposure outcome by restricting learning.

Although the aforementioned theories have led many clinicians to advise against or to encourage clients to eliminate the use of distraction during exposure, there are theories that suggest that distraction may not have a negative impact on treatment, and may actually enhance fear reduction. For example, Bandura (1977, 1988) proposed that fear reduction can occur via increased self-efficacy due to a sense of mastery over a situation, leading to increased confidence. Therefore, the mere completion of an exposure exercise allows for fear reduction regardless of the exposure conditions. This self-efficacy theory further posits that there may be benefits to the use of distraction. Specifically, emotional arousal can contribute to perceptions of coping ability, and distraction often reduces arousal levels, thereby providing individuals with the sense that they are capable of conquering difficult tasks. Others have also suggested that the use of distraction may not be detrimental, specifically if the goal does not relate to preventing feared catastrophes but is rather aimed at reducing distress (e.g., Salkovskis, 1991; Salkovskis, Clark, & Gelder, 1996).

Over the past few decades, numerous studies have experimentally evaluated the use of distraction in the context of exposure. A review conducted by Rodriguez and Craske (1993) explored the results of early investigations of distraction use in exposure. Findings differed extensively in terms of outcome, which was proposed to be related to the use of diverse and

inconsistent experimental paradigms. Since 1993, numerous additional studies have been conducted with (continued) mixed findings. Many studies have shown that distraction is helpful during exposure (e.g., Johnstone & Page, 2004; Oliver & Page, 2008), that distraction is harmful to the exposure process (e.g., Schmid-Leuz, Elsesser, Lohrmann, Jöhren, & Sartory, 2007; Kamphuis & Telch, 2000; Telch et al., 2004), and that there are no differences between using and not using distraction (e.g., Antony et al., 2001; Rose & McGlynn, 1997). Given these mixed findings, it is important to consider what other factors may be involved, potentially leading to discrepant findings. These include (but are not limited to) individual differences, experimental design (e.g., type of distraction used, length of exposure, outcome measures, instructions), and the nature of the problem being investigated (e.g., type of anxiety disorder or analogue sample being used).

Surprisingly, very little research has been conducted to investigate individual differences (e.g., personality, psychopathology, coping style, individual preferences for distraction use, perceived necessity of distraction use) that may relate to outcome in exposure with or without distraction. Given that these factors vary across individuals, it is possible that some or all of these elements may relate to inconsistent findings across studies. It may be especially important to consider how much individuals naturally tend to distract themselves in the context of anxiety-provoking situations, as well as their perceptions of the utility of distraction. Specifically, individuals who tend to rely more on distraction in their daily lives may benefit less from using distraction during treatment, whereas individuals who do not tend to use distraction may actually benefit from using distraction during exposure, at least during initial phases of treatment. Indeed, Rodriguez and Craske (1993) suggested that natural coping style may predict treatment outcome better than the use of attention focus versus distraction during exposure. Others have further suggested the potential importance of the intention or purpose behind the use of coping strategies (e.g., Helbig-Lang & Petermann, 2010; Thwaites & Freeston, 2005), noting that understanding the reason driving the use of such strategies may aid in categorizing maladaptive versus adaptive coping. While adaptive coping may not lead to long-term consequences, the use of maladaptive coping strategies (or the overuse or reliance upon these strategies) aimed at preventing feared outcomes may be problematic (Thwaites & Freeston, 2005). Furthermore, the theory that distraction use may not interfere with treatment because it does not specifically aim to prevent catastrophes (e.g., Salkovskis, 1991) may not hold if an individual feels they *need*

distraction, as the function of distraction use may then be construed as aiming to prevent a catastrophic outcome. Unfortunately, research related to the typical use of and/or maladaptive beliefs about distraction (i.e., reliance on distraction) has thus far been limited.

Most research conducted on individual differences in typical distraction use has assessed general coping strategies such as the use of monitoring (i.e., seeking out information related to threat) or blunting (i.e., blocking out threat information) coping styles (Miller, 1980). Given that Foa and Kozak (1986) proposed that attention to feared stimuli is important to effective exposure, it was theorized that monitors, (who inherently attend to threat) would benefit from exposure more than blunters (who avoid threat). A number of studies investigated whether monitors or blunters differ in terms of exposure response. Generally, results indicated little or no difference between individuals who monitor versus those who blunt in terms of treatment outcome (Muris, de Jong, Merckelbach, & van Zuuren, 1993a; Steketee, Bransfield, Miller, & Foa, 1989), and in one case blunters actually showed greater improvement (Muris, de Jong, Merckelbach, & van Zuuren, 1993b). In an effort to extend these findings, Antony and colleagues (2001) investigated individual differences in participants' typical use of monitoring and blunting strategies and how conducting exposure with or without distraction impacted outcome in each of these groups. They predicted that for individuals who tend to use a blunting coping style, distraction use would interfere with the ability to benefit from exposure, whereas those who tend to monitor may benefit from the use of distraction. They examined these hypotheses in a sample of spider phobic individuals, and found no interaction between coping style and symptom improvement: exposure outcome was similar whether or not distraction was used, and also regardless of typical coping style.

Although the study conducted by Antony and colleagues (2001) provided initial insight into how individual coping styles may (or may not) relate to outcome of focused versus distracted exposure, it was limited somewhat by the measurement of the two coping styles (monitoring and blunting) that were investigated. Firstly, monitoring and blunting are not mutually exclusive categories, and thus individuals may not fit cleanly into one category or another, making it more difficult to evaluate differences between coping styles. Furthermore, typical scales used to assess the general use of monitoring and blunting coping styles either include a small range of uncontrollable or threatening situations (e.g., Miller Behavioral Style Scale; Miller, 1987) or include many items related to a specific type of uncontrollable situation

such as a medical procedure (e.g., Monitoring Blunting Questionnaire (MBQ); Muris, van Zuuren, de Jong, de Beurs, & Hanewald, 1994), and therefore do not reflect a broad range of situations. Finally, the blunting component of these measures assesses how much an individual engages in distraction-related techniques, but does not assess specific beliefs related to distraction use.

A number of existing questionnaires include small subscales assessing the use of distraction when anxious; however, many of these questionnaires are limited to only a few items, and therefore may not be comprehensive. For example, the Cognitive Avoidance Questionnaire (CAQ; Sexton & Dugas, 2008) was developed in the context of research on generalized anxiety disorder and evaluates a variety of strategies individuals may utilize in response to their thoughts. The CAQ includes a distraction subscale with five items such as "I often do things to distract myself from my thoughts" and "To avoid thinking about subjects that upset me, I force myself to think about something else". Another questionnaire, the Brief COPE (Carver, 1997), includes a number of strategies an individual may use to cope in difficult situations. This measure was initially developed with a population of hurricane survivors, and has since been used in a number of research areas including health psychology. The Brief COPE's self-distraction subscale consists of only two items, including "I've been turning to work or other activities to take my mind off things".

Importantly, the questions used to assess distraction use in existing measures typically address whether or not individuals distract themselves and occasionally what strategies they use. Although it is important to ascertain whether and how people use distraction when anxious, it may be essential to understand what importance individuals place on the use of distraction. For example, if one individual who uses distraction finds it helpful yet does not feel overly reliant on distraction use, this person may react differently to the use (or lack thereof) of distraction in the context of treatment than someone who feels that distraction is necessary to be able to make it through anxiety-provoking situations (i.e., maladaptive beliefs about distraction). Given the potential importance of knowing whether or not distraction can or should be used with individuals who tend to distract themselves to cope with anxiety, it is imperative that we have the ability to measure this reliably. It is therefore important to assess the beliefs an individual holds about the function that distraction serves in their ability to cope with anxiety.

This study aimed to take a preliminary step towards understanding the impact of beliefs about distraction on exposure outcome through creating and validating a questionnaire to assess maladaptive beliefs about distraction: the Beliefs about Distraction Inventory (BADI). The measure evaluates facets such as how necessary, essential, and effective an individual feels distraction is when faced with anxiety, and how frequently they use distraction when in anxiety-provoking situations. A questionnaire of this nature will allow for more accurate assessment of distraction-related beliefs, which can then be used to better assess the relationships between maladaptive beliefs about distraction and the efficacy of using distraction during exposure.

The BADI was first validated through an exploratory factor analysis with an unselected student sample (to allow for a range of responses), and then further assessed with a confirmatory factor analysis with a contamination-fearful sample (to confirm the factor structure in a sample that would likely display a smaller range of scores). We hypothesized that scores on the BADI would correlate with measures assessing frequency and/or type of distraction use (e.g., the MBQ blunting subscale, the CAQ), and would not correlate with seemingly unrelated constructs (e.g., agreeableness, the MBQ monitoring subscale). We further hypothesized that BADI scores would be related to self-reported symptoms of psychopathology. Finally, we hypothesized that the factor structure of the BADI would display adequate model fit via a confirmatory factor analysis.

Method

Participants

Participants were recruited independently for two different samples: an unselected student sample for an exploratory factor analysis, and a contamination-fearful sample for a confirmatory factor analysis. Due to the fact that participants from the two samples were recruited for two different studies, the measures administered to each sample were not identical (see below).

Unselected student sample. Participants were undergraduate students (N = 506) who completed a battery of self-report questionnaires through an online survey system in exchange for extra credit in a course. Participants ranged in age from 18 to 57 (M = 22.84, SD = 5.26) years, and the majority of participants was female (n = 436, 86%) and identified themselves as Caucasian (n = 339, 67%). In order to assess the nonclinical nature of the sample, participants completed measures of anxiety and depression. Mean scores on the Depression Anxiety Stress

Scales-21 (see Table 1) were somewhat higher than student sample means from a previous study (Henry & Crawford, 2005), but well below the means for individuals with clinically diagnosed anxiety and mood disorders (Antony, Bieling, Cox, Enns, & Swinson, 1998). Mean scores on the Beck Anxiety Inventory also reflected scores for nonclinical samples in other studies (e.g., Creamer, Foran, & Bell, 1995). Together these findings support the nonclinical nature of the current sample.

Contamination-fearful sample. Undergraduate students and community members were pre-screened for high levels of contamination fear and were invited to take part in a larger study investigating a component of treatment for contamination fear. Of the participants who completed the larger study, only individuals with a contamination subscale score of 14 or higher on the Vancouver Obsessional Compulsive Inventory (VOCI; Thordarson et al., 2004), were included in the current sample. This inclusion score was selected because it falls both one standard deviation below the mean of individuals with contamination-related OCD, and one standard deviation above the student sample mean (Thordarson et al., 2004).

A total of 132 individuals met criteria and were included in the current study. This sample consisted of 103 undergraduate students who completed the study in exchange for course credit, and 29 community members who were recruited through online advertisements and completed the study in exchange for financial compensation. The majority of participants was female (n = 115, 87%) and identified themselves as Caucasian (n = 69, 52%). Participants ranged in age from 18 to 81 years, with a mean age of 25.78 (SD = 9.91) years. Mean scores on the contamination subscale of the VOCI reflect those reported by a clinical sample with contamination-related obsessive-compulsive disorder (Thordarson et al., 2004), and are reported in Table 1 along with mean scores on measures of general symptoms of anxiety and depression.

Measures

Measures completed by both the unselected student and contamination-fearful samples

Beliefs about Distraction Inventory (BADI). The BADI is a measure of maladaptive beliefs about distraction, developed to be validated in the current study. The goal was to include items related to beliefs about the necessity, effectiveness, and frequency of distraction use, due to suggestions that the *intention* behind the use of coping strategies (including overuse or reliance upon such strategies) may be problematic and lead to long-term difficulties with anxiety (e.g.,

Table 1

Self-Reported Symptoms of Anxiety and Depression in the Unselected Student and Contamination-Fearful Samples

	Unselected Student (n = 506)		Contamination-Fearful (n = 132)	
	M	*SD*	*M*	*SD*
DASS-21				
Depression	4.48	4.10	-	-
Anxiety	3.43	3.25	-	-
Stress	6.68	4.20	-	-
BAI	11.20	8.59	14.74	10.48
BDI-II	-	-	14.14	11.31
VOCI-CTN	-	-	26.64	9.21

Note. DASS-21 = Depression Anxiety Stress Scales-21; BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory-II; VOCI-CTN = Contamination Subscale of the Vancouver Obsessional Compulsive Inventory.

Thwaites & Freeston, 2005). We also decided to include items representing a belief that distraction works, as we did not necessarily expect that individuals would report relying on distraction if they find it useful. Items were created in consultation with a team of researchers by first describing the desired content areas and then requesting feedback on both wording and item selection. Items were rejected if they were confusing or did not appear relevant to the constructs being evaluated.

The initial BADI included 43 potential items and was reduced through factor analysis (and removal of reverse-scored items) to 24 items related to beliefs about the necessity and utility of distraction when faced with anxiety-provoking situations (see Table 2 for retained items). Individuals responded using a 7-point Likert-type scale (1 = *disagree very much* and 7 = *agree very much*). Total scores can range from 24 to 168. Prior to responding to individual items, individuals are asked to consider the types of distraction they typically use and indicate their typical strategies on a provided list of 12 distraction techniques (e.g., think of something relaxing or calming, read something, talk to someone, think about something important to me)[1].

Monitoring Blunting Questionnaire (MBQ; Muris et al., 1994). The MBQ presents individuals with ten hypothetical threat-related situations, as well as definitions of both monitoring (i.e., information-seeking) and blunting (i.e., information-avoiding). For each hypothetical threat-related situation, individuals use a 10-point scale Likert scale (0 = *not at all* and 10 = *very much*) to rate both the extent to which they would use a monitoring coping style, and to what extent they would use a blunting coping style. Each subscale can have scores ranging from 0 to 100. In this study, the blunting subscale of the MBQ was used in order to determine the convergent validity of the BADI, given that this subscale is relevant to the use of distraction. The monitoring subscale was used to assess for divergent validity. Internal consistency in the unselected student sample was $\alpha = .77$ for the monitoring subscale, and $\alpha = .76$ for the blunting subscale. Internal consistency in the contamination-fearful sample was $\alpha = .74$ for the monitoring subscale, and $\alpha = .81$ for the blunting subscale.

Beck Anxiety Inventory (BAI; Beck & Steer, 1990). The BAI is a 21-item questionnaire that assesses general symptoms of anxiety. Participants indicate the how much they have been bothered by a variety of anxiety-related symptoms (e.g., dizziness, difficulty breathing, sweating)

[1] The final version of the BADI (including the instructions and distraction techniques checklist) is available free of charge from either author for public use.

Table 2

Two-Factor Solution for the BADI Using Principal Axis Factoring

Item		Factor Loadings		h^2
		BADI-N	BADI-E	
19.	If I can't distract myself, I won't be able to handle my anxiety	**.92**	-.16	.71
17.	If I don't distract myself, there is no way I can make it through difficult situations	**.89**	-.15	.67
7.	If I don't properly distract myself when I'm anxious, I may "lose it" completely	**.84**	-.11	.61
18.	My anxiety overwhelms me if I don't distract myself	**.81**	-.04	.62
13.	Feeling anxious is unbearable, so I always try to distract myself	**.80**	.01	.65
5.	Without distraction, I wouldn't be able to cope with anxiety	**.78**	-.03	.58
11.	I have to distract myself the entire time that I am in an anxiety-provoking situation for it to work	**.76**	-.02	.55
8.	Distraction is the only way I can get rid of anxiety	**.74**	.03	.57
23.	I distract myself every time that I am in an anxiety-provoking situation	**.72**	.12	.64
16.	I constantly use distraction to feel less anxious	**.71**	.12	.61
6.	I don't know of any better way to reduce my anxiety than using distraction	**.65**	-.03	.41
15.	I use a lot of mental effort to focus on distracting myself when I'm anxious	**.58**	.11	.42
2.	Distracting myself is the only way to make it through an anxious situation	**.58**	.14	.44
9.	I use distraction even in situations that only make me a little bit anxious	**.54**	.10	.36
4.	I always distract myself when I'm feeling anxious	**.53**	.28	.53
21.	When I know I'm going to be in an anxiety-provoking situation, I always prepare to distract myself	**.51**	.16	.37
12.	I wish I could make it through difficult situations without needing to distract myself	**.48**	.10	.29
24.	When I am anxious, I am able to feel less anxious by distracting myself	-.10	**.81**	.58
22.	Distraction helps me manage my anxiety	.09	**.76**	.66
3.	Distraction is useful for reducing my anxiety	-.08	**.74**	.49
10.	Using distraction makes anxiety manageable	.04	**.71**	.53
20.	I distract myself because I am less anxious if part of my mind is focused on something else	.07	**.56**	.37
14.	Distracting myself makes it easier for me to stay in anxiety-provoking situations	.15	**.51**	.37
1.	I rely on distracting myself in order to reduce my anxiety	.21	**.43**	.33

Eigenvalue	10.88	2.39
% of variance	45.32	9.95

Note. $N = 475$; h^2 = communality; bold values indicate factor loadings > .40.

in the past week using a 4-point Likert-type scale with scores ranging from 0 (*not at all*) to 3 (*severely – I could barely stand it*). Scores on the BAI can range from 0 to 63. The BAI was used to determine whether the unselected student sample was nonclinical in nature, and whether the BADI was associated with general symptoms of anxiety. In the unselected student sample internal consistency was $\alpha = .90$, and in the contamination-fearful sample it was $\alpha = .92$.

Measures completed by the unselected student sample only

Cognitive Avoidance Questionnaire (CAQ; Sexton & Dugas, 2008). This English version of the CAQ was adapted from the original version (Gosselin et al., 2002). The CAQ is a 25-item questionnaire assessing five domains of cognitive avoidance techniques, including thought suppression, avoidance of threat, thought substitution, transformation of images into thoughts, and distraction. Participants use a 1 (*not at all typical*) to 5 (*completely typical*) Likert-type scale to indicate whether they typically use the strategy that is presented. Total scores can range from 25 to 125. Retest reliability was high for the total scale ($r = .85$) and subscales (ranging from $r = .70$-$.79$; Sexton & Dugas, 2008). The distraction subscale (which consists of five items) was used in the current study to assess for construct validity of the BADI. The internal consistency for the distraction subscale in the unselected student sample was $\alpha = .85$.

Depression Anxiety Stress Scales-21 (DASS-21; Lovibond & Lovibond, 1995). This scale is composed of 21 items that assess three subscales: depression, anxiety, and stress. Participants use a 4-point Likert-type scale ranging from 0 (*never*) to 3 (*almost always*) to indicate how often each statement applied to them over the past week. Each subscale contains seven items; therefore, scores in each subscale can range from 0 to 21. The DASS was used in the current study to verify the nonclinical nature of the unselected student sample, and to assess the relationship between anxiety, stress, and depressive symptoms and distraction-related beliefs. Internal consistencies for the unselected student sample were $\alpha = .89$ for the depression subscale, $\alpha = .76$ for the anxiety subscale, and $\alpha = .85$ for the stress subscale.

Brief COPE (Carver, 1997). The Brief COPE is a 28-item scale that assesses different ways in which people cope with stressful situations. Participants are asked to respond to items on a 1 (*I haven't been doing this at all*) to 4 (*I've been doing this a lot*) scale. The Brief COPE includes 14 two-item subscales, including denial, active coping, venting, acceptance, positive reframing, and self-distraction. Each two-item subscale has a score range of 1 to 8. The self-distraction subscale was used in the current study to establish convergent validity. The self-

distraction subscale, consisting of two items, had an internal consistency of α = .71 in a population of individuals tested following a hurricane (Carver, 1997). In the unselected student sample, internal consistency of the two-item self-distraction subscale was α = .42.

Response Styles Questionnaire (RSQ; Nolen-Hoeksema, 1991). The RSQ is a 71-item questionnaire that assesses behaviours individuals engage in when feeling depressed. Individuals use a 4-point Likert-type scale with scores ranging from 0 (*almost never*) to 3 (*almost always*) to indicate how frequently they engage in each of the coping strategies. The RSQ contains four subscales: rumination, distraction, problem-solving, and dangerous activities. In the current study, the distraction subscale of the RSQ was used to assess the convergent validity of the BADI. The distraction subscale contains 11 items, so subscale scores can range from 0 to 33. Internal consistency for the distraction subscale in the unselected student sample was α = .75.

Big Five Inventory (BFI; John, Donahue, & Kentle, 1991). The BFI is a 44-item questionnaire that assesses each of the big five personality traits: openness, agreeableness, neuroticism, conscientiousness, and extraversion. Each item is rated on a 5-point Likert-type scale from 1 (*disagree strongly*) to 5 (*agree strongly*). The agreeableness subscale (nine items with a range of possible scores from 9 to 45) of this measure was used to assess divergent validity with the BADI. The internal consistency of this subscale in the unselected student sample was α = .75.

Measures completed by the contamination-fearful sample only

Vancouver Obsessional Compulsive Inventory (VOCI; Thordarson et al., 2004) is a 55-item questionnaire that assesses a broad range of obsessive compulsive symptoms, including a contamination subscale consisting of contamination-related obsessions and associated washing and cleaning compulsions. The contamination subscale (VOCI-CTN) was used in the current study to assess severity of contamination fear. The VOCI-CTN subscale is composed of 12 items, leading to a score range of 0 to 48. Participants use a 5-point Likert-type scale with scores ranging from 0 (*not at all*) to 4 (*very much*) to indicate how much each statement is true of them. Retest reliability in a student sample was 0.91, and the VOCI also shows good convergent and divergent validity (Thordarson et al., 2004; Radomsky et al., 2006). Internal consistency for the contamination subscale in the contamination-fearful sample was α = .85.

Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II is a 21-item questionnaire that aims to assess symptoms related to depression. Participants respond

to items using a 0 to 3 scale indicating the severity or frequency of symptoms over the past two weeks. Total scores can range from 0 to 63. In the current study, the BDI-II was used in the contamination-fearful sample to determine severity of depressive symptoms; internal consistency was $\alpha = .94$.

Procedure

Unselected student sample. Participants received a link via e-mail to complete the aforementioned questionnaires after signing up for the study through an online participant pool. All questionnaires (see *Measures*) and questions regarding demographic information were administered via SelectSurvey, an online questionnaire software. Additionally, a subset of participants was re-contacted after a four week delay to complete the BADI a second time in order to assess retest reliability. Of the 130 participants who were asked to complete the BADI for retest, 81 completed the questionnaire (62%), with a mean retest interval of 30.96 (*SD* = 4.22) days.

Contamination-fearful sample. The contamination-fearful sample was comprised of both undergraduate students and community members. Undergraduate participants completed an online screening questionnaire to assess for high levels of contamination fear, and were contacted and scheduled for the study if their responses exceeded a predetermined cut-off. Community participants were either contacted from a list of registry participants who have agreed to be contacted about studies in our laboratory, or responded to online ads. These individuals then completed the screening measure over the phone, and were invited to participate if their responses met inclusion criteria. The only additional inclusion criterion was scoring 14 or higher on the VOCI-CTN subscale on the day of the study (see *Participants*), and 76 individuals who presented at the lab did not meet this cut-off (these individuals were not included in the sample size listed above). As mentioned above (see *Participants*), these individuals were participating in a study investigating a component of treatment for contamination fear. Prior to the completion of any active components of the larger study, they completed a number of questionnaires, including the BADI.

Results

BADI Distraction Strategies Checklist

Prior to completing the BADI, individuals selected typical strategies they use to distract themselves from a provided list (for examples, see *Measures*); they were also permitted to

include their own items. Individuals selected an average of 4.70 items (SD = 2.00). The number of items selected was significantly correlated with total scores on the BADI, r = .23, p < .001.

Data Screening

Unselected student sample. Given that this study was administered through an online survey system that required a response to all items, there were no missing data. Mahalanobis distance was calculated for items on the BADI using a chi-square cut-off of p < .001; a total of 31 multivariate outliers were identified and removed from subsequent analyses. Using Tabachnick and Fidell's (2007) criteria of standardized scores exceeding +/- 3.29, no univariate outliers were identified on the BADI. Thus the total sample retained for analysis was N = 475.

Inspection of a histogram of total scores and calculations of skew and kurtosis (z = 0.93 and 0.41, respectively) suggest a normal distribution of scores on the BADI. The Kolmogorov-Smirnov (K-S) test also suggested a normal distribution of scores on the BADI, D(475) = .04, p = .20, as did visual inspection of a Q-Q plot. Therefore, there are no problems with normality present on the BADI. Finally, multivariate normality was not assessed given the nonclinical nature of the sample (i.e., violations are unlikely and any changes would cause problems for ecological validity).

Prior to conducting the factor analysis, all reverse-scored items (16 items) were removed due to potential measurement issues associated with the use of such items (e.g., Hazlett-Stevens, Ullman, & Craske, 2004; Rodebaugh, Woods, & Heimberg, 2007). Next, correlations between remaining variables were inspected for problems (i.e., multicollinearity or lack of substantial correlations). One item was removed for having very few substantial correlations (very few items correlating with other variables above r = 0.30; Field, 2009).

Contamination-fearful sample. The same screening process described above was used to screen data for the contamination-fearful sample prior to conducting a confirmatory factor analysis. No univariate outliers were identified, and three multivariate outliers were identified and removed, leaving a final sample of N = 129. Inspection of a histogram of total scores and calculation of skew and kurtosis (z = -0.14 and -0.33, respectively) suggest a normal distribution of scores on the BADI. The Kolmogorov-Smirnov (K-S) test also indicated a normal distribution of scores on the BADI, D(129) = .05, p = .20, as did visual inspection of a Q-Q plot.

Factor Structure

Exploratory factor analysis with unselected student sample. An exploratory factor analysis (EFA) using principal axis factoring (PAF) was conducted in order to assess the best fit factor structure for the BADI. PAF was chosen because it often leads to more stable loadings, and generally outperforms maximum likelihood factor analysis (de Winter & Dodou, 2012). After removing outliers the final sample size was 475, which constitutes an acceptable sample size based on the typical suggested sample size of at least 300, or at least 10 participants per variable (for a review, see Field, 2009). Inspection of the Kaiser-Meyer-Olkin value verified adequate sample size for the analysis, KMO = .96, which falls in the 'superb' range (Field, 2009). Additionally, all KMO values for individual items had values greater than .80, with the majority exceeding .90, which is above the recommended level of .50 (Field, 2009). Finally, Bartlett's test of sphericity was significant, χ^2 (351) = 7447.74, $p < .001$, which indicates that intercorrelations between items were large enough for conducting EFA.

An EFA with PAF was conducted on the 26 items that remained after removing reverse-scored and problematic items (see Data Screening), and an oblique rotation was employed (Promax). There were three factors with eigenvalues over Kaiser's criteria of 1, together accounting for 57.25% of the variance, and scree plot inflexions indicated either a two- or three-factor structure. Given the relatively large sample size, scree plot inflexions were used as a basis for further analysis. Complex items were classified as those with high loadings (*r*'s >.32) on multiple factors (Tabachnick & Fidell, 2007). When conducting the EFA using a three-factor structure, the third factor only contained two items, both of which were complex items, indicating that no items could be retained in this factor. The two-factor solution contained only one complex item, and had a strong factor structure that made conceptual sense. After removing the complex item ("I feel most comfortable if I am able to distract myself when I am nervous") and one additional item that did not load on either factor ("If I distract myself, I can do things I would never be able to do otherwise"), the factor analysis was re-run and the resulting two-factor solution was retained (see Table 2). A total of 24 items were retained in the final version of the scale following the aforementioned removal of complex items, with factor 1 containing 17 items, and factor 2 containing 7 items. These two factors together accounted for 55.27% of the variance. Finally, the two factors were interpretable, with factor 1 consisting of items describing distraction as necessary (Distraction is Necessary Subscale; BADI-N), and factor 2 consisting of items describing distraction as effective (Distraction is Effective Subscale; BADI-E).

Confirmatory factor analysis with contamination-fearful sample. A confirmatory factor analysis was conducted using the contamination-fearful sample. After removing multivariate outliers, the resulting sample included 129 individuals. There are a number of different recommendations for sample size in CFA, ranging from five participants per parameter (Bentler & Chou, 1987) to 15 cases per parameter (Stevens, 2009). Another suggestion is that for models with more than ten parameters, samples sizes less than 200 are likely to produce unstable results (Loehlin, 1992). The current sample is on the low end of acceptable participants per parameter at approximately five participants per parameter, which may lead to less stable results.

A bootstrap procedure was used to test the two-factor solution resulting from the abovementioned EFA. Model fit was evaluated through inspection of a number of fit indices, including the goodness of fit index (GFI), root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI), and parsimonious goodness of fit index (PGFI). Additionally, the chi-square/degrees of freedom (relative chi-square index; CMIN/DF) was used because strictly utilizing the significance of the chi-square test does not typically provide an accurate representation of fit due to sample size (e.g., Bentler, 1990); on this index, scores below 2 represent good fit (Byrne, 1989). Values above .90 on the GFI (Kline, 2011), CFI (Bentler, 1990), and TLI (Tucker & Lewis, 1973) indicate that a model demonstrates acceptable fit. An RMSEA value of below .08 is considered acceptable, while values below .05 are excellent (Browne & Cudeck, 1993). Finally, PGFI values above .50 represent acceptable model fit (Mulaik et al., 1989).

The initial iteration demonstrated somewhat poor fit overall with some indices in the ideal range (CMIN/DF = 1.86, RMSEA = .08, PGFI = .64), and other indices not meeting the suggested cut-offs (CFI = .88, GFI = .76, TLI = .87). Inspection of modification indices indicated that the addition of several covariance paths between error terms might aid in improving model fit. Three covariance paths were added for error terms within a single latent variable (for complete model, see Figure 1). Following the addition of paths between error terms model fit improved and was adequate, with good or excellent fit on most indices, CMIN/DF = 1.73, RMSEA = .07, PGFI = .65, CFI = .90, TLI = .89, and GFI = .78.

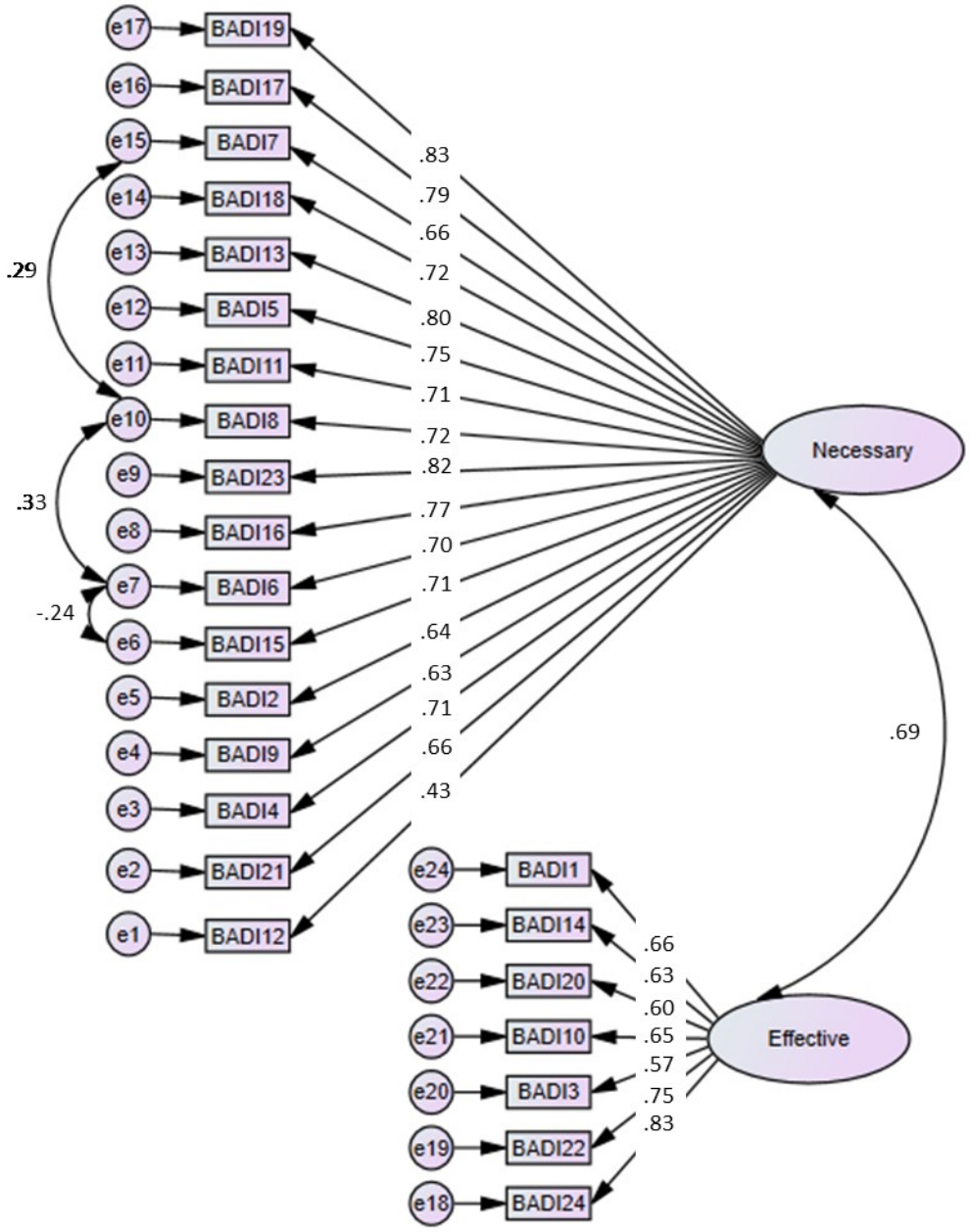

Figure 1. Confirmatory factor analysis of a two-factor model of the Beliefs about Distraction Inventory. All paths are significant at $p < .01$.

Reliability and Validity of the BADI in an Unselected Student Sample

Internal consistency. Internal consistency was calculated for the full-scale BADI as well as each of the two subscales. The first factor of the BADI showed excellent reliability, while the second factor showed somewhat lower (but still very good) reliability (see Table 3). When considering the full-scale BADI of 24 items, reliability was excellent, $\alpha = .95$.

Retest reliability. A subset of participants completed the BADI for a second time approximately four weeks after their initial participation in the study (see *Procedure*). Retest reliability analyses showed that scores were stable over time, $r = .78$, $p < .001$. However, scores on the BADI-N subscale were more stable ($r = .80$, $p < .001$) than scores on the BADI-E ($r = .56$, $p < .001$). Finally, analyses were conducted to assess consistency in selection of distraction techniques that were chosen prior to completing the BADI. At the second administration, individuals re-selected an average of 74% ($SD = 24.44$) of the items they selected at the first administration, and selected a mean of 1.52 ($SD = 1.32$) new items. The number of items selected at the first time point was significantly correlated with the number of items selected at the second time point, $r = .58$, $p < .001$.

Convergent validity. Correlations between total and subscale scores on the BADI and existing measures of distraction were investigated in order to establish convergent validity. These existing measures included the distraction subscales of the CAQ and RSQ (CAQ-D and RSQ-D), the self-distraction subscale of the Brief COPE (COPE-D), and the blunting subscale of the MBQ (MBQ-B). The CAQ-D, COPE-D, and MBQ-B were all significantly correlated with total BADI scores and scores on both BADI subscales; however, scores on the RSQ-D were significantly correlated with the BADI-E subscale only (see Table 3). Therefore, it appears that the BADI displays adequate convergent validity.

Relationship with general symptoms of anxiety and depression. In order to assess whether scores on the BADI were related to symptoms of anxiety and depression, correlations were conducted with scores on the DASS and BAI. Scores on all DASS subscales and the BAI correlated with the BADI and both BADI subscales (see Table 3). It therefore appears that scores on the BADI are associated with symptoms of anxiety and depression.

Divergent validity. The monitoring subscale of the MBQ (MBQ-M) and the agreeableness subscale of the BFI (BFI-A) were used to assess for divergent validity. The BADI

Table 3

Means, Internal Consistency, and Correlations Between Total and Subscale Scores on the BADI With Predicted Convergent, Divergent, and Symptom Measures in Both the Unselected Student (EFA) and Contamination-Fearful (CFA) Samples

	Unselected Student Sample (EFA) (n = 475)			Contamination-Fearful Sample (CFA) (n = 129)		
	BADI	BADI-N	BADI-E	BADI	BADI-N	BADI-E
Convergent						
CAQ-D	.57***	.56***	.42***	-	-	-
COPE-SD	.32***	.28***	.34***	-	-	-
RSQ-D	-.02	-.03	.16**	-	-	-
MBQ-B	.21***	.18***	.22***	.32**	.31**	.25*
Divergent						
BFI-A	-.17***	-.20***	.01	-	-	-
MBQ-M	.03	.01	.10*	-.07	-.10	.07
Symptoms						
DASS-D	.36***	.40***	.14**	-	-	-
DASS-A	.40***	.43***	.16***	-	-	-
DASS-S	.36***	.39***	.16***	-	-	-
BAI	.40***	.43***	.17***	.36***	.40***	.13
BDI-II	-	-	-	.19*	.24**	-.02
VOCI-CTN	-	-	-	.22*	.25**	.06
BADI-N	.98***	-	-	.98***	-	-
BADI-E	.73***	.58***	-	.78***	.64***	-
BADI Mean (*SD*)	91.16 (24.82)	56.28 (20.72)	34.88 (6.22)	106.95 (25.87)	70.02 (21.18)	36.94 (6.54)
BADI α	.95	.95	.85	.95	.94	.85

Note. BADI = Beliefs about Distraction Inventory; BADI-N = Distraction is Necessary Subscale of the Beliefs about Distraction Inventory; BADI-E = Distraction is Effective Subscale of the Beliefs about Distraction Inventory; CAQ-D = Distraction Subscale of the Cognitive Avoidance Questionnaire; COPE-SD = Self-Distraction Subscale of the Brief COPE; RSQ-D = Distraction Subscale of the Response Styles Questionnaire; MBQ-B = Blunting Subscale of the Monitoring Blunting Questionnaire; BFI-A = Agreeableness Subscale of the Big Five Inventory; MBQ-M = Monitoring Subscale of the Monitoring Blunting Questionnaire; DASS-D = Depression Subscale of the Depression Anxiety Stress Scales-21; DASS-A = Anxiety Subscale of the Depression Anxiety Stress Scales-21; DASS-S = Stress Subscale of the Depression Anxiety Stress Scales-

21; BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory-II; VOCI-CTN = Contamination Subscale of the Vancouver Obsessional Compulsive Inventory. * $p < .05$; ** $p < .01$; *** $p < .001$.

total and subscale scores and MBQ-M were not significantly correlated, and the BFI-A was significantly negatively correlated with total BADI and BADI-N subscale scores, but not with BADI-E subscale scores (see Table 3). Given that BFI-A scores were correlated with BADI and BADI-N subscale scores, *t*-tests for dependent correlations were conducted in order to establish whether these associations were as strong as correlations with divergent measures. Scores on the BADI are more strongly correlated with CAQ-D scores than BFI-A scores, $t(474) = 13.13$, $p < .001$, and a similar relationship was observed for BADI-N subscale scores, $t(474) = 13.64$, $p < .001$. Therefore, although BFI-A scores were correlated with the BADI and one of the subscales, the correlations between the BADI and a predicted convergent measure were significantly stronger.

Reliability and Validity of the BADI in the Contamination-Fearful Sample

Internal consistency for the BADI in the contamination-fearful sample was excellent, $\alpha = .95$. Factor scores for the BADI-N and BADI-E also exhibited strong internal consistency, $\alpha = .94$ and .85, respectively. Convergent validity was confirmed using MBQ-B scores, while divergent validity was confirmed using MBQ-M scores (see Table 3). Total BADI scores and BADI-N scores correlated with symptoms of depression, general anxiety, and contamination fear, whereas BADI-E scores did not correlate with these symptoms. Overall relationships were similar to those seen in the nonclinical EFA sample, except that BADI-E scores were not correlated with symptoms of psychopathology in the CFA (contamination-fearful) sample.

Discussion

This study involved creating and validating a measure of maladaptive beliefs about distraction when in anxiety-provoking situations, namely the Beliefs about Distraction Inventory (BADI). Given that there were no specific hypotheses regarding the number of factors, an exploratory factor analysis using principal axis factoring was conducted. Analyses revealed a two-factor structure, including Distraction Is Necessary (BADI-N) and Distraction Is Effective (BADI-E) subscales. The BADI-N factor consisted of 17 items related to the belief that distraction is necessary in order to make it through anxiety provoking situations, and the BADI-E factor consisted of seven items related to the belief that distraction is effective in reducing anxiety. The ability to distinguish between these two sets of beliefs is of theoretical importance, as reliance on distraction (reflected in the BADI-N subscale) may be more problematic than a more general belief that distraction is effective and is therefore useful (reflected in the BADI-E

subscale); indeed, from the perspective of the patient or client, when distraction does succeed in reducing anxiety during difficult or challenging situations, it *is* both successful and effective. Total BADI scores and scores on both BADI subscales were related to existing measures of distraction use as well as general symptoms of anxiety and depression. Overall the BADI was found to be a reliable and valid measure with excellent internal consistency and good retest reliability (although only moderate retest reliability was observed for the BADI-E subscale).

As predicted, the BADI and its subscales were positively correlated with measures assessing frequency of distraction use during anxiety-provoking situations, in both the unselected and contamination-fearful samples. It is not surprising that individuals who frequently use distraction would also hold beliefs that distraction is necessary and effective. However, the distraction subscale of the RSQ (administered in the unselected student sample), which assesses coping strategies for depression, was only significantly correlated with the BADI-E subscale. Therefore, the use of distraction when depressed appears to be related to the belief that distraction is an effective tool to cope with anxiety, which may indicate that distraction can be viewed as an effective tool across a number of emotional states. Conversely, if an individual holds the belief that distraction is *necessary* to cope with anxiety, this may not directly relate to whether or not they use distraction when depressed. It is worth noting that although the self-distraction subscale of the COPE was correlated with BADI scores, the internal consistency for this subscale was very low in the current sample ($\alpha = .42$), limiting the interpretability of this relationship. Finally, the number of items selected from the provided list of distraction techniques was significantly correlated with total BADI scores, suggesting that individuals who implement a broader range of distraction techniques when faced with anxiety appear to hold stronger maladaptive beliefs about distraction. This provides further support for the relationship between BADI scores and other measures of distraction use that assess frequency of distraction use.

Scores on the BADI and its subscales were also significantly correlated with measures of general anxious and depressive symptomatology in the unselected student sample, although correlations with the BADI-E subscale were of a smaller magnitude. In the contamination-fearful sample, symptoms of anxiety, depression, and contamination fear were related to BADI and BADI-N, but not to BADI-E scores. It makes theoretical sense that correlations between symptom measures and BADI-E scores may be of a smaller magnitude compared to BADI or

BADI-N subscales, as the belief that distraction is necessary may relate more to psychopathology than simply the belief that distraction is effective or useful. In this regard, holding the belief that distraction is effective may not necessarily be maladaptive. The relationship of BADI and BADI-N scores with measures of psychopathology could either be due to increased need for coping strategies related to high levels of anxiety, or due to an increase in symptom presentation over time following consistent use of distraction when anxious. The direction of this relationship should be clarified through further (likely experimental) investigations. It is also worth noting that the observed relationship between BADI scores and other forms of negative affect (e.g., depression, stress) makes theoretical sense, given that individuals may turn to distraction to deal with a range of negative emotional states.

Finally, when considering measures predicted to be unrelated to distraction-related beliefs, the BADI was not related to scores on the monitoring subscale of the MBQ in the unselected or contamination-fearful samples. However, scores on the agreeableness subscale of the BFI (BFI-A) administered in the unselected student sample were negatively correlated with total BADI and BADI-N scores (but not the BADI-E subscale). Further analysis confirmed that associations between both the total BADI and BADI-N scores and the distraction subscale of the CAQ were of a larger magnitude than associations with the BFI-A. Therefore, measures that were predicted to be unrelated to BADI scores were either not correlated with the BADI, or were correlated to a lesser degree than measures that were predicted to relate to the BADI.

A contamination-fearful sample was used to conduct a CFA using the proposed factor structure identified through the EFA. The final iteration of this CFA showed adequate model fit, although some values were slightly below the suggested cut-offs. It is possible that better fit may have been established with a larger sample. However, results of the CFA support the preliminary factor structure of the BADI, and scores in the contamination-fearful sample correlate with divergent and convergent measures as well as with measures of psychopathology to a similar degree as the correlations seen in the undergraduate EFA sample.

Overall it appears that the BADI is a reliable and valid measure; however, the BADI-E subscale has fewer items and somewhat less strong psychometric properties than the BADI-N subscale. It is possible that the BADI-E subscale, which appears to be less related to psychopathology, has a wider range of scores across individuals. The fact that BADI-E scores relate less strongly to psychopathology may in part lead to these differences between subscales.

Interestingly, BADI-E scores were correlated with psychopathology in the unselected student sample, but not in the contamination-fearful sample. It is possible that the larger sample size in the unselected student sample may have allowed for associations to be observed, or that the larger range of scores may have influenced the ability to observe this relationship. It would be interesting to see if a similar pattern is observed in future studies using the BADI.

While this study has promising results, there are some notable limitations. The EFA included an undergraduate student sample, and it is possible that individuals with lower levels of anxiety may have different perceptions of the necessity of distraction use than those with more severe levels of anxiety, limiting generalizability to a clinical and/or treatment-seeking sample. The CFA used a specific contamination-fearful sample with unconfirmed clinical status (and a small sample size); this focus on only one specific type of anxiety may limit our understanding of the factor structure in a generally anxious sample. It may be interesting to assess whether distraction-related beliefs differ across different types of anxiety. Additionally, both the EFA and CFA samples were predominantly comprised of Caucasian women, further limiting generalizability to other populations. In summary, this is the first attempt to our knowledge to create a measure assessing maladaptive beliefs about distraction use, but replication (including a confirmatory factor analysis using a larger sample and more diverse clinical samples) is recommended in order to confirm and extend the current results.

The instructions for the BADI ask individuals to reflect on strategies they use to distract themselves when anxious, but do not ask individuals to report the types of anxiety-provoking situations they considered. Given that individuals may be considering different forms of anxiety when responding to this questionnaire, this may not lead to equivalent perceived need for distraction. Indeed, it is possible that the use of or reliance upon distraction when dealing with general daily anxiety may not be as detrimental as its use when dealing with anxiety associated with an anxiety disorder diagnosis. Additionally, although individuals are asked to select items from a list of distraction techniques prior to responding to items on the BADI, this list is not comprehensive. While some individuals may consider additional strategies, others may feel limited to considering only provided items. However, many individuals in the current study elected to add their own distraction techniques in addition to those listed. Individuals also selected an average of 4 to 5 items from the list, further supporting that a range of techniques were considered. Therefore, although we cannot assume that all individuals were approaching

the questionnaire with the same strategy, we can assume that they were at least considering distraction in a similar manner.

Having an accurate measure of maladaptive distraction-related beliefs may be clinically useful in terms of understanding the impact that these beliefs have on treatment outcome during CBT. This may be important given high rates of treatment refusal and drop-out, which may in part reflect a need for treatment-enhancing variables. For example, in a study by Bados, Balaguer, and Saldaña (2007), approximately 44% of the individuals who began treatment dropped out. Of these individuals, 67% provided a reason for dropping out, 47% of which reported that they dropped out due to low motivation or being dissatisfied with the treatment or therapist. Of course it is difficult to know the proportion of individuals who would endorse having discontinued treatment due to disliking the treatment (or exposure specifically). However, given the possibility that drop-out and refusal rates in CBT may in part be high due to the anxiety-provoking nature of exposure (e.g., Veale, 1999), the addition of techniques that might aid in diminishing anxiety may be a helpful method by which to increase treatment acceptability. Bandura (1977; 1988) suggested that distraction may aid in fear reduction. Specifically, individuals often gauge their ability to cope based on their level of physiological arousal, so a reduction in physiological arousal due to distraction may in fact aid both in increasing self-efficacy and facilitating fear reduction. However, results from experimental studies of distraction use during exposure have been mixed, highlighting the importance of learning more about factors that may be related to these discrepant results.

Given that individual differences in beliefs about distraction may be one relevant factor, it is important that we have an accurate measure of this construct. Importantly, it has been suggested that the use of coping strategies (which may include distraction) out of necessity may be problematic in the long-term (e.g., Thwaites & Freeston, 2005). If an individual tends to rely on distraction in their daily life, it is important to understand whether this reliance impacts their general response to treatment, and whether distraction is harmful or helpful for this individual during exposure. For example, individuals who rely on distraction may benefit from being advised against using distraction during exposure, while the same advice may be harmful for individuals who do not rely on distraction. The results of the current study suggest that beliefs that distraction is necessary may be more associated with symptoms of psychological distress than beliefs that distraction is effective, and by extension could implicate these beliefs as an

indicator for reducing distraction during exposure; the belief that distraction is effective may not be indicative of such a need; of course, this is an empirical question.

More research is needed to further investigate how maladaptive beliefs about distraction may relate to treatment outcome. Future research should confirm the factor structure of the BADI, and begin to investigate the impact that maladaptive beliefs about distraction may have on treatment outcome. For example, it is possible that maladaptive beliefs about distraction may have a negative impact on treatment outcome, but this has not been investigated. If maladaptive beliefs about distraction have a negative impact on treatment, these beliefs could be more explicitly targeted in order to improve treatment outcome. Therefore, it would be useful to look at how BADI scores relate to treatment as usual, how these beliefs impact treatment outcome when distraction is utilized (and when it is discouraged), and whether changes in maladaptive beliefs about distraction occur following successful treatment.

Although there are some limitations, the current study presents a novel attempt to assess maladaptive beliefs about distraction use, which may be an important and informative area for study with potential for impacting treatment recommendations for anxiety. Although a number of questionnaires have been developed that include subscales assessing whether individuals use distraction, these do not address underlying beliefs about distraction which may be important. Thus the current study provides a novel understanding of two possible belief domains that may drive individuals to use distraction, factors which may hold more importance than simply those associated with the use of distraction.

CHAPTER 3

Bridge

There has been much debate over the past few decades regarding the impact of distraction use on exposure outcome. Given the wealth of discrepant experimental results, specific factors related to distraction may need to be investigated in more detail in order to illuminate what impact distraction has on exposure outcome, and for whom this impact may be greatest. Study 1 focused on the development and validation of a measure of maladaptive beliefs about distraction (the Beliefs about Distraction Inventory; BADI). Items were generated with the goal of including statements reflecting that distraction is necessary to cope with anxiety, that distraction is an effective or useful strategy, and how often an individual resorts to distraction use when anxious.

The factor structure and psychometric properties of the BADI were first evaluated in an unselected student sample using exploratory factor analysis. Results indicated a two-factor structure, one related to distraction being necessary (BADI-N), and one related to distraction being effective (BADI-E). The BADI exhibited acceptable internal consistency, retest reliability, and convergent and divergent validity. Scores on the BADI also correlated with measures of general anxiety, depression, and stress, although the correlations of these measures with the BADI-E subscale were not as strong. Subsequently, a confirmatory factor analysis was conducted with a contamination-fearful sample. Results generally suggested adequate model fit, and correlations with convergent and divergent measures were similar in magnitude to those obtained in the exploratory factor analysis. Correlations between symptoms of psychopathology and the two different BADI factors showed a similar pattern to that mentioned above, although the difference was more robust in the contamination-fearful sample. Specifically, while symptoms of psychopathology were significantly correlated with BADI-N subscale scores, they were not significantly correlated with BADI-E subscale scores. It is possible that beliefs that distraction is necessary or essential are more related to psychopathology than beliefs that distraction is effective or can be helpful.

The beliefs an individual holds about distraction, particularly if they have a strong reliance on distraction, may be an important factor to consideration in the potential use of distraction during exposure. However, very little is known about the impact these beliefs may have on exposure outcome. Study 1 involved validating a measure of beliefs about distraction

that can be used in future studies, a first and important step to being able to understand whether and how these beliefs may affect treatment. (Of note, the BADI was also administered in a study of distraction during exposure, and the associated results are briefly presented in Chapter 5). Investigating idiosyncratic beliefs about distraction is one possible avenue to gain further understanding as to when distraction should or should not be utilized, and will be important to continue investigating in the future. First, however, it will be important to see if distraction is beneficial or harmful in exposure more generally through consideration of other possible explanations for the discrepancies in the extant literature.

One important issue that warrants attention is the apparent variability in distraction tasks that have been employed in previous experiments. Although numerous factors may be relevant to consider when investigating design differences across studies, one such factor was investigated in Study 2: the level of cognitive load involved in distraction tasks. The first experiment conducted in Study 2 involved validating potential distraction tasks to use in the second experiment, which consisted of completing an exposure session while utilizing various levels of distraction (or no distraction). Differences in exposure outcome were investigated, but another central research question pertained to whether the use of distraction may actually lead to greater changes in self-efficacy or greater perceived acceptability of treatment. These factors are being investigated due to high levels of treatment refusal and drop-out for exposure therapy (e.g., Bados, Balaguer, & Saldaña, 2007), and thus a need for elucidating methods by which to increase treatment acceptability.

CHAPTER 4

Too Little, Too Much, or Just Right? Does the Amount of Distraction Make a Difference during Contamination-Related Exposure?

When faced with anxiety-provoking situations, individuals often attempt to reduce their distress through the use of distraction strategies. These strategies are typically employed in order to distance oneself from a feared situation through reduced visual or cognitive attention. Although it has been suggested that distraction during exposure interferes with emotional processing (e.g., Foa & Kozak, 1986; Rachman, 1980) by reducing attentional focus (e.g., Barlow, 1988), others have asserted that fear reduction can occur through other means (see Rachman, 2015). For example, Bandura (1977, 1988) proposed that fear reduction can occur following mastery over a situation, resulting in increased self-confidence, self-efficacy, and perceived ability to conquer tasks. Individuals often use emotional arousal as a measure of coping ability, and the use of distraction may aid in reducing arousal, thereby increasing feelings of accomplishment. It has thus been argued that increased self-efficacy may relate to fear reduction, and importantly that distraction does not necessarily impede (and may in fact aid in) this process. Furthermore, cognitive accounts of fear reduction during exposure postulate that disconfirmation of catastrophic beliefs plays a central role in exposure outcome. Salkovskis (1991) suggested that the use of strategies that decrease anxiety in a situation will not interfere with fear disconfirmation, as helping manage anxiety does not inherently block the ability to obtain disconfirmatory evidence. Although these (and other) theories do not predict a negative impact associated with distraction use, it remains important to understand when, how, and for whom the use of distraction may be appropriate. Furthermore, given a recent focus on treatment acceptability (e.g., Milosevic, Levy, Alcolado, & Radomsky, in press), it may be useful to investigate whether distraction may be another avenue by which to increase acceptability.

Although many studies have investigated the possible utility of distraction during exposure, results are inconsistent. While some studies show no difference in treatment outcome when distraction is used versus when it is not (e.g., Antony et al., 2001; Rose & McGlynn, 1997), others show that distraction impedes fear reduction within (e.g., Kamphuis & Telch, 2000; Rodriguez & Craske, 1995) and between sessions (e.g., Craske, Street, & Barlow, 1989; Kamphuis & Telch, 2000), while others show that distraction can aid in fear reduction within (e.g., Craske, Street, Jayaraman, & Barlow, 1991; Grayson, Foa, & Steketee, 1986; Penfold &

Page, 1999) and between sessions (e.g., Johnstone & Page, 2004; Oliver & Page, 2003, 2008). Given these discrepant results, it is important to investigate specific factors that may influence outcome. Although several aspects may be relevant, one potentially important factor relates to the level of difficulty (i.e., cognitive load) of the distraction tasks that are utilized (e.g., Kamphuis & Telch, 2000; Podină, Koster, Philippot, Dethier, & David, 2013; Rodriguez & Craske, 1993, 1995; Telch et al., 2004).

Studies investigating distraction use during exposure have employed a wide variety of distraction tasks with differing levels of complexity. For example, distraction tasks have included reading words aloud (e.g., Haw & Dickerson, 1998), viewing images (e.g., Rodriguez & Craske, 1995), playing video games (e.g., Grayson, Foa, & Steketee, 1982, 1986), conversational tasks (e.g., Oliver & Page, 2003), and completing complex mathematical tasks (e.g., Kamphuis & Telch, 2000). Careful consideration of task-related differences may be central to understanding the role of distraction during exposure, given that varied levels and forms of distraction may lead to diverse outcomes. Specifically, the amount of cognitive resources necessary to engage in distraction tasks (i.e., cognitive load or working memory taxation) will inherently differ based on task complexity. Working memory refers to the memorial system responsible for holding, manipulating, and processing information (see Baddeley, 1992); when working memory is taxed, resources are being utilized at close to their capacity. When a task involves greater levels of cognitive load, fewer cognitive resources are available to process other aspects of one's environment and experience. It is possible that if distraction tasks involve differing levels of working memory taxation or cognitive load, variable levels of resources would remain available to comprehensively process the exposure, including fear-related learning and memory encoding, could therefore be affected.

The effect of cognitive load on exposure outcome has been established as a likely mechanism underlying the effects of eye movement desensitization and reprocessing (EMDR), a treatment for posttraumatic stress disorder (PTSD; e.g., Bisson et al., 2007). EMDR involves the visualization of past traumatic experiences (i.e., imaginal exposure) while focusing on the therapist's finger moving back and forth (Shapiro, 1995). Some have questioned whether the exposure component is the active ingredient in EMDR, or whether eye movements add something unique. While some have reported that exposure is the active ingredient in EMDR (for a review see Cahill, Carrigan, & Frueh, 1999), a more parsimonious conceptualization of

EMDR includes the theorized treatment enhancing role of eye movements. Specifically, Shapiro (1989) argued that exposure alone was insufficient, and that eye movements appeared to be a helpful component in fear reduction. In a study by Lee, Taylor, and Drummond (2006), qualitative coding of the content of imaginal exposure alone or with eye movements indicated that when individuals processed trauma in a detached fashion they showed greater improvement; detachment was identified as a specific consequence of EMDR. Importantly, more recent studies have established that the efficacy of EMDR may relate to the eye movements taxing working memory or increasing cognitive load (Engelhard, van den Hout, Janssen, & van der Beek, 2010; Engelhard et al., 2011; van den Hout & Engelhard, 2012; van den Hout et al., 2010).

It is proposed that given the limited capacity of working memory (Miller, 1956), engaging in a task that utilizes a portion of this capacity while concurrently imagining distressing memories will result in less resource allocation to the distressing memory, thus reducing vividness and emotionality of the memory during recoding. In support of this hypothesis, variable tasks that tax working memory (using methods other than eye movements) have been investigated and exhibit similar results to eye movements, including counting tasks (van den Hout et al., 2010), auditory shadowing (Gunter & Bodner, 2008), and drawing a complex figure (Gunter & Bodner, 2008). Tasks that appear to utilize very few working memory resources (e.g., finger tapping) do not enhance treatment outcome, and thus perform at a similar level to imaginal exposure without eye movements (van den Hout, Muris, Salemink, & Kindt, 2001). Furthermore, it has been theorized that the dose-response curve related to working memory taxation may exhibit an inverted U-shape, with too little or too much taxation not aiding in reductions of vividness or emotionality. For example, when working memory is highly taxed, insufficient resources are available to successfully hold the distressing memory in one's mind while also performing the working memory task (Engelhard, van den Hout, Janssen, & van der Beek, 2010); thus, reductions in vividness and emotionality no longer result.

If working memory is taxed during an anxiety-provoking experience (e.g., an exposure session), the emotionality of the experience may be less intense and less vivid, thus leading to encoding the event as less distressing. Theoretically, this suggests that differing levels of cognitive load during exposure may in fact lead to altered levels of processing of treatment components. In order to experimentally investigate this theory, the two studies presented below were designed to determine the impact of varied levels of cognitive load in distraction tasks on

exposure outcome. The first experiment aimed to assess the level of cognitive load of a number of different tasks in order to select appropriate distraction tasks for the second study, which investigated the effect of differing levels of distraction on exposure outcome in a contamination-fearful sample. It was hypothesized that moderate levels of distraction during exposure would enhance fear reduction compared to a no distraction control, and that high levels of distraction would interfere with fear reduction.

Another important question was whether the use of distraction would be associated with higher levels of treatment acceptability. To our knowledge, the acceptability of treatment with or without the use of distraction has yet to be investigated; however, distraction is often construed as a type of covert safety behaviour, and recent work has begun to focus on the potential acceptability-enhancing role of the use of safety behaviour in treatment. Specifically, preliminary studies have established that the use of safety behaviour may increase treatment acceptability, both experimentally in a student sample (Levy & Radomsky, 2014), and via treatment vignettes rated by both student (Levy, Senn, & Radomsky, 2014; Milosevic & Radomsky, 2013a) and clinical (Milosevic & Radomsky, 2013a) samples. Therefore, we also assessed treatment acceptability following an exposure session with or without distraction (Experiment 2), and hypothesized that treatment acceptability would be rated highest in conditions using moderate and high levels of distraction.

Experiment 1

This study aimed to establish the level of cognitive load associated with five different distraction tasks to determine which would best represent three differing levels of cognitive load: low, moderate, and high. We predicted that seemingly more complex tasks would lead to higher levels of cognitive load. Cognitive load was assessed by measuring change in reaction time on a computerized task when completing concurrent tasks, with greater reaction times indicating greater cognitive load. We also predicted that subjective cognitive load (i.e., self-reported task difficulty) would correlate with objective cognitive load (i.e., changes in reaction time).

Method

Participants. Participants were (N = 180) undergraduate students who completed the study in exchange for course credit. Following the exclusion of four participants (see below), data from 176 participants were retained. Participants ranged in age from 18 to 51 years, with a mean age of 23.08 (SD = 5.58) years. The majority of participants was female (82%) and

Caucasian (66%). There were no significant differences between conditions in terms of age, $F(4, 175) = 1.33$, $p = .26$, partial $\eta^2 = .04$, or sex, $\chi^2(4) = 2.60$, $p = .63$.

Measures

Discrimination reaction time task. Participants completed a simple computer-based reaction time task during practice, baseline, and test phases. Individuals were instructed to press the 'left shift' key if they saw a circle and the 'right shift' key if they saw a triangle. This procedure was based on a reaction time task used by van den Hout and colleagues (2010) to establish cognitive load and working memory taxation. Inter-stimulus intervals were random and ranged from 2.2 to 3 seconds. The stimulus remained on the screen until a response was recorded. The practice phase consisted of 12 trials to orient participants to the task. During the baseline phase 48 reactions were recorded over approximately three minutes, and during the test phase 84 reactions were recorded over approximately five minutes.

Cognitive load questions. Participants were asked to respond to four items created for the purposes of this study which aimed to assess perceived cognitive load (i.e., working memory taxation) during the study. Specifically, participants used a 10-point Likert-type scale (0 = *not at all* and 9 = *completely*) to indicate to what extent they had to use mental effort to complete the task, how much attention was required, how difficult was it to focus on the computer task, and how distracting they found the verbal task to be. The internal consistency for the total sample was $\alpha = .89$, with internal consistencies by condition ranging from $\alpha = .75$ to .89.

Materials. The computerized reaction time task was displayed on a 30 cm by 48 cm monitor. Stimuli were white shapes (2.5 cm in diameter) presented in the center of a black screen. Participants used a standard keyboard to respond to stimuli, with the 'left shift' and 'right shift' keys clearly labeled as 'LEFT' and 'RIGHT', respectively.

Procedure. Participants first completed a brief training phase to ensure they understood the reaction time task. They then completed a baseline reaction time task (baseline phase) followed by concurrently completing the reaction time task and one of five randomly assigned verbal distraction tasks (test phase). The five tasks are described below in ascending order of predicted complexity (i.e., cognitive load). Task 1 involved repeating words (e.g., full, night, room) read aloud by the experimenter. Task 2 involved naming the colour of items (e.g., lemon, flamingo, cotton) read aloud by the experimenter. Task 3 involved a conversation about goals, school, and the future, guided by a standard list of questions. Task 4 involved providing detailed

procedural descriptions of how to complete tasks (e.g., making dinner, getting ready for bed). Task 5 involved the same conversation task as Task 3, but participants were also instructed to say ”three” after every third word they said. This portion of the study was audio-recorded for reliability purposes. After completing the test phase, participants responded to questions about perceived cognitive load.

Data analyses. Change in reaction time from baseline to test phase was used as an index of cognitive load for each task (i.e., more slowed reaction times would relate to more taxing tasks). The main outcome variables were change in reaction time (mean of test phase – mean of baseline phase) and percent change in reaction time ((mean of test phase – mean of baseline phase)/mean of baseline phase), which takes initial reaction time performance into account.

Results

Data screening and cleaning. First, all reaction times associated with incorrect responses were removed (coded as missing). Mean reaction times were then calculated for each participant for baseline and test phases, as well as change in reaction time and percent change in reaction time. There were four outliers on baseline performance: two with low accuracy, and two with slow reaction times. Given that baseline performance for these four individuals was different than average, they were removed from subsequent analyses.

Outliers for the reaction times during the test phase (and change and percent change in reaction time) were evaluated within groups rather than the total sample, given that reaction times were likely to differ across groups. For change in reaction time, four outliers were identified, and for percent change in reaction time, three outliers were identified. Outliers on these variables were not removed given that variable response times were important to the study hypotheses. However, given that outlying scores may impact analyses, all outlying scores were converted to the corresponding score of the next highest Z-score in that condition.

Manipulation check. A blind rater listened to 20-second segments of each audio-recording and predicted each participant’s condition assignment. All recordings (100%) were identified as belonging to the correct condition.

Overall analyses. Prior to conducting change and percent change analyses, a 2 (time) by 5 (condition) mixed ANOVA was conducted in order to investigate condition differences in reaction times at baseline and test periods. There was a main effect of condition, $F(4, 175) = 12.77$, $p < .001$, partial $\eta^2 = .23$, a main effect of time, $F(1, 175) = 195.80$, $p < .001$, partial $\eta^2 =$

.53, and a significant time by condition interaction, $F(4, 175) = 16.00$, $p < .001$, partial $\eta^2 = .27$. The observed interaction (see Figure 2) indicated that as predicted task complexity increased, the difference between baseline and test phase reaction times increased.

One-way ANOVAs were conducted in order to investigate condition differences in change and percent change in reaction time. Mean change and percent change in reaction time by condition are presented in Table 4, and mean reaction times at baseline and test are displayed in Figure 2. Overall, the hypothesized order of task complexity was largely supported. For change in reaction time, there was a significant difference between conditions, $F(4, 175) = 22.25$, $p < .001$, partial $\eta^2 = .34$. Post hoc analyses using a Bonferroni correction indicated significant differences between all conditions except for conditions 2 and 3, and a trend towards a significant difference between conditions 1 and 2. For percent change in reaction time, there was a significant difference between conditions, $F(4, 175) = 20.14$, $p < .001$, partial $\eta^2 = .32$. Post hoc analyses using a Bonferroni correction indicated significant differences between all conditions except for conditions 1 and 2, 2 and 3, and 3 and 4. Therefore, considering both outcome variables, there were significant differences between conditions 1, 3, and 5 (see Table 4).

Subjective cognitive load. A one-way ANOVA was conducted to investigate condition differences on self-reported cognitive load. Results showed a significant difference between conditions, $F(4, 175) = 15.98$, $p < .001$, with post-hoc analyses using a Bonferroni correction showing no differences between conditions 2, 3, and 4, but significant differences between all other condition pairs (p's < .048). Therefore, subjective cognitive load was significantly different between conditions 1, 3 and 5.

Correlation between self-reported taxation and reaction time changes. Mean responses on self-reported cognitive load questions were correlated with mean reaction time at test period, change in reaction time, and percent change in reaction time. Self-reported cognitive load was significantly associated with mean reaction time at test period, $r = .38$, $p < .001$, change in reaction time from baseline to test period, $r = .45$, $p < .001$, and percent change in reaction time from baseline to test period, $r = .41$, $p < .001$. Therefore, when considering each of three values representing objective cognitive load, subjective measures of cognitive load were significantly correlated with objective measures.

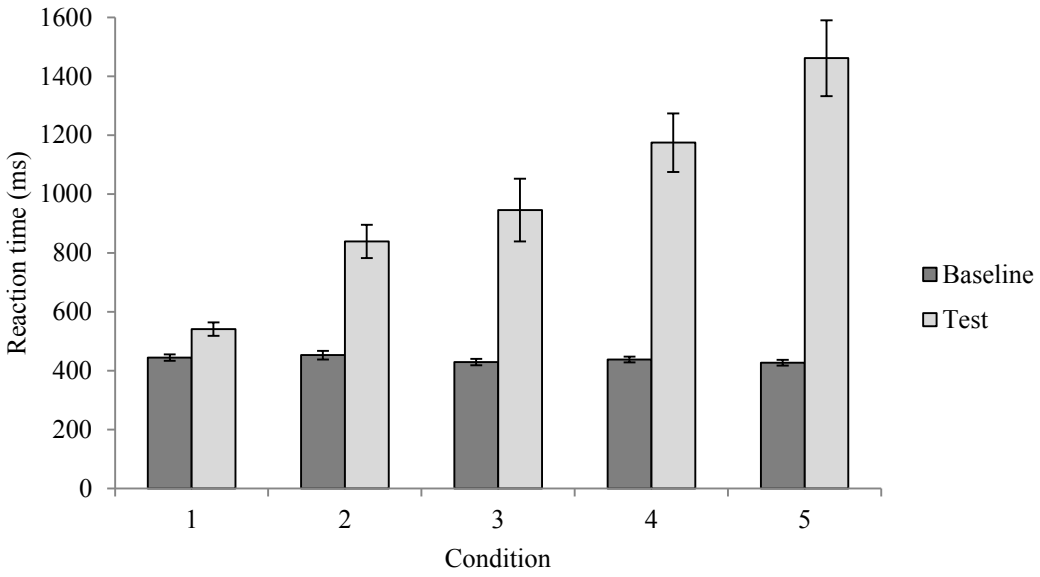

Figure 2. Mean reaction times during baseline and test phases, by condition in Experiment 1. Error bars are standard errors.

Table 4

Reaction Time by Condition and Time, and Change and Percent Change in Reaction Time by Condition in Experiment 1

	Condition				
	1	2	3	4	5
Baseline *M* (*SD*)	444.89[a] (64.16)	453.47[a] (86.56)	429.44[a] (63.99)	438.67[a] (59.24)	427.20[a] (59.08)
Test *M* (*SD*)	541.66[a] (132.84)	838.92[ab] (332.85)	945.71[bc] (627.93)	1174.71[bc] (597.11)	1461.22[d] (760.74)
Change *M* (*SD*)	92.76[a] (118.53)	385.45[ab] (293.65)	409.62[b] (243.37)	722.80[c] (550.28)	1034.02[d] (744.83)
Percent change *M* (*SD*)	21.56[a] (27.74)	84.21[ab] (58.53)	111.85[bc] (109.39)	163.89[c] (120.51)	239.97[d] (169.02)

Note. All reaction times are reported in milliseconds; 1 = Condition 1 (word repetition); 2 = Condition 2 (colour naming); 3 = Condition 3 (conversation); 4 = Condition 4 (procedural descriptions); 5 = Condition 5 (conversation with threes); Baseline = baseline phase; Test = test phase; Change = change in reaction time from baseline to test phase; Percent change = percent change in reaction time from baseline to test phase (since individuals often at least doubled or even tripled their reaction time from baseline to test period, many mean percentage values exceed a 100% increase); within each row, values that share the same superscripted letter did not significantly differ from each other ($p > .05$).

Discussion

The level of cognitive load associated with the five verbal distraction tasks evaluated in this experiment followed the hypothesized pattern of results, with seemingly more complex tasks largely leading to higher levels of objective cognitive load (i.e., greater increases in reaction time). For subjective (i.e., self-reported) cognitive load, a similar pattern of results was observed, although the three tasks in the moderate range (i.e., tasks 2, 3, and 4) did not differ significantly from one another. Importantly, self-reported and objective ratings of cognitive load were correlated, suggesting that individuals were relatively accurate at evaluating their experience. These results are promising given the difficulty associated with concurrently completing a distraction task, an objective measure of cognitive load for that task, and an exposure exercise. In other words, self-reported cognitive load appeared to act as a reasonable proxy for objective cognitive load, and can therefore be utilized as a measure of cognitive load in upcoming studies.

The main purpose of Experiment 1 was to assess specific tasks for Experiment 2, evaluating the impact of cognitive load on exposure outcome. It was determined that tasks 1, 3 and 5 could be categorized as having low, moderate, and high levels of cognitive load, respectively. Specifically, there were significant differences in reaction time changes between each of these conditions, such that each task utilized a different amount of cognitive resources. By experimentally establishing levels of task complexity, more accurate conclusions can be drawn in later studies that utilize these tasks.

This study had a number of limitations that are worth mentioning. First, although reaction time was measured during both baseline and test phases (with the baseline phase serving as a control), no control group (i.e., with no distraction task during the test phase) was included. It is possible that fatigue effects and/or practice effects may have impacted reaction times during the test phase. However, the question addressed in this study related to differences between distraction tasks rather than specific differences from baseline. Second, the reaction time task was quite simple. Although this may have allowed for more clear differences between conditions, it may not generalize to more complex tasks, such as exposure. It is unclear whether the same magnitude of results would have been observed with a more complex reaction time task. Another potential limitation is that participants were not given specific instructions regarding which task they were to complete with the greatest accuracy; therefore, individuals

may have approached the tasks with different goals. Additionally, during the reaction time task, the symbol remained on the screen until a response was indicated (i.e., there was no response time limit), which limited the ability to interpret accuracy-related results. Finally, while the tasks have been categorized as having low, moderate, and high levels of cognitive load, it is possible that more and less cognitively demanding tasks exist, and thus the selected tasks may not necessarily represent the full range of possible levels of cognitive load.

Despite these limitations, this study was able to experimentally validate a number of verbal distraction tasks with respect to cognitive load. These results highlight the importance of considering the type of distraction tasks used in research, given that tasks varied significantly in terms of how much effort was required to complete them. These tasks can now be utilized to evaluate the impact of distraction during exposure with empirically-established differences in distraction task complexity.

Experiment 2

This study aimed to assess whether level of distraction impacted exposure outcome. The tasks that were validated in Experiment 1 were used to create conditions of low, moderate, and high distraction (previous tasks 1, 3 and 5, respectively), which were evaluated against a no distraction control. We predicted that individuals would show the greatest improvement when a moderate level of distraction was employed, that no distraction and low distraction would lead to similar outcomes, and that individuals who used a high level of distraction would show the least improvement due to the fact that they were too distracted to benefit from the exposure.

Additionally, this study investigated the impact of distraction use on perceived acceptability of treatment and changes in self-efficacy over the course of an exposure session. Given that recent research has suggested that the use of safety behaviour may enhance the acceptability of treatment (e.g., Levy & Radomsky, 2014; Milosevic & Radomsky, 2013a), and that distraction is often considered a covert form of safety behaviour, it was predicted that individuals using at least a moderate level of distraction would rate the acceptability of the exposure session higher than individuals who did not use distraction. Furthermore, it was predicted that increases in self-efficacy would be greatest for the moderate distraction condition. Greater increases in self-efficacy have been observed in previous studies in conditions using distraction compared to focused exposure (e.g., Johnstone & Page, 2004). This relates to Bandura's (1977, 1988) self-efficacy theory proposing that distraction can aid in reducing

physiological arousal which leads to more positive perceptions of coping ability. However, the same degree of change in self-efficacy was not expected when individuals were highly distracted due to the fact that less overall improvement was predicted to occur in this condition due to the high level of distraction employed.

Method

Participants. Participants were members of the community with subclinical levels of contamination fear who participated in exchange for financial compensation, or undergraduate students with subclinical levels of contamination fear who participated in exchange for course credit or financial compensation. Community members were either recruited through our pre-existing registry of clinical participants or responded to online advertisements, and undergraduate participants were recruited through an online participant pool. All participants were pre-screened for high levels of contamination fear, and were invited to participate if their responses met inclusion criteria (see *Procedure*). Additionally, participants had to remain eligible following a final in-lab screening to complete the entire study.

A total of 124 individuals were eligible for and participated in the study, 103 (83%) of whom were recruited as part of the undergraduate sample. Participants had a mean age of 24.85 (*SD* = 8.29) years. The majority was female (*n* = 114, 92%) and identified as Caucasian (*n* = 64, 52%). Mean scores on measures of contamination fear were representative of a fearful sample, and are reported in Table 5. Participants were randomly assigned to one of four conditions (see *Procedure*), and there were no condition differences in terms of age, sex, or symptoms of depression, or contamination fear (see Table 5). One participant (in the control condition) dropped out of the study during the exposure session due to their anxiety. Additionally, three individuals did not return for the second visit, and therefore were excluded from analyses assessing change from post-exposure to follow-up.

Measures

Vancouver Obsessional Compulsive Inventory (VOCI; Thordarson et al., 2004). The VOCI is a 55-item questionnaire that assesses a broad range of obsessive compulsive symptoms, including a subscale consisting of contamination-related obsessions and associated washing and cleaning compulsions. The contamination subscale was used to assess severity of contamination fear. Participants used a 5-point Likert scale with scores ranging from 0 to 4 to indicate how

Table 5

Participant Characteristics by Condition in Experiment 2

		Condition					
	Total	Control	Low	Moderate	High		
	(*N* = 124)	(*n* = 31)	(*n* = 30)	(*n* = 33)	(*n* = 30)	*F*/*χ2*	*p*
Age *M* (*SD*)	24.85 (8.29)	24.35 (7.62)	26.07 (8.15)	23.64 (6.93)	25.47 (10.38)	0.54	.657
Female *n* (%)	114 (91.9)	28 (90.3)	26 (86.7)	32 (97.0)	28 (93.3)	2.44	.486
BDI-II *M* (*SD*)	12.02 (10.06)	12.74 (11.38)	12.30 (10.42)	12.48 (10.49)	10.50 (7.87)	0.31	.820
VOCI-CTN *M* (*SD*)	22.31 (11.49)	21.74 (11.09)	22.23 (11.30)	21.85 (11.92)	23.50 (12.07)	0.15	.931

Note. BDI-II = Beck Depression Inventory-II; VOCI-CTN = Contamination Subscale of the Vancouver Obsessional Compulsive Inventory.

much each statement is true of them. Internal consistency for the contamination subscale in the current sample was α = .91.

Treatment Acceptability and Adherence Scale (TAAS; Milosevic, Levy, Alcolado, & Radomsky, in press). The TAAS is a 10-item questionnaire that assesses perceived acceptability of treatment (e.g., "It would be distressing to me to participate in this treatment", "If I began this treatment, I would be able to complete it"). Statements are rated on a 7-point Likert scale from 1 (*disagree strongly*) to 7 (*agree strongly*). This scale was used to assess the perceived acceptability of the exposure component of the study. The internal consistency in the current study was α = .88.

Self-Efficacy Questionnaire for Phobic Situations (SEQ; Flatt & King, 2009). The SEQ is a 13-item questionnaire that aims to assess aspects of perceived self-efficacy. Individuals use a 5-point Likert scale to indicate their perceived ability to cope with situations related to their feared stimulus. In the current study, participants were asked to consider "feared contaminants, contamination-related situations, and fear of becoming ill" when completing the questionnaire. This scale was created and validated on a child and adolescent sample; however, the items reflect the construct of self-efficacy and are written in language appropriate for adults. This scale was used to assess perceived self-efficacy before and after an exposure session, and at one-week follow-up. Internal consistency in the current sample was α = .70.

Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II is a 21-item questionnaire that aims to assess depressive symptoms occurring over the previous two weeks. Participants use a 4-point scale to indicate how frequently they have experienced each symptom. The internal consistency for the current sample was α = .93.

Behavioural Approach Test (BAT). The BAT is a frequently used behavioural measure of fear that assesses willingness to approach a feared stimulus. In the current study, participants were asked to approach a "dirty" toilet, and their ability to approach and interact with the toilet was coded on a multi-step hierarchy (see Appendix A).

Subjective Units of Distress Scale (SUDS; Wolpe, 1958). The SUDS was used to assess distress level at multiple time points during the study (e.g., during BATs, during an exposure session). Ratings are made on a 0 to 100 scale, with 0 being *no anxiety whatsoever*, and 100 being *the worst anxiety imaginable*.

Questions assessing cognitive load and attention.

Cognitive load. Participants in distraction conditions were asked to use a 10-point Likert scale (0 = *not at all* to 9 = *completely*) to rate the extent to which they agreed with each of three statements. Items were created for the purpose of the current study, and assessed how difficult the verbal task was perceived to be, and how much mental effort it took to complete the verbal task. The internal consistency for these items was $\alpha = .61$. Participants in the control condition were asked to respond to similar statements that were worded to be relevant to their experience (i.e., how difficult it was to remain quiet).

Visual attention. These two items aimed to assess how often participants visually attended to the toilet, and asked what percent of the time their visual focus was on the toilet (later converted from a 0 to 100 scale to the 0 to 9 scale detailed above) and how often they visually attended to something other than the toilet (reverse-scored). The internal consistency for these items was $\alpha = .65$.

Other distraction strategies used. Participants were also asked to respond to a single question (using the 0 to 9 scale described above) to indicate how often they utilized distraction techniques during the exposure that they were not specifically asked to use.

Previous psychological and psychopharmacological treatment. Participants responded to questions about whether they had ever taken medication or received psychotherapy for psychological problems. If they had received psychotherapy, they were asked to specify what problems were addressed and to respond to a number of specific questions about the psychotherapy. These questions were based on the OCD Treatment History Questionnaire (Stobie, Taylor, Quigley, Ewing, & Salkovskis, 2007), but were altered to be relevant to CBT more generally. In the current study, to meet criteria for previous CBT, the treatment must have included: at least six sessions that lasted at least 40 minutes, some form of exposure, homework, a focus on a problem rather than childhood, an active (i.e., not silent) therapist, and a discussion of the links between behaviour, thoughts, and emotions.

Materials. The "dirty toilet" used in this study as the fear stimulus was a plain white toilet that was made to appear dirty by spreading potting soil and melted chocolate inside the toilet bowl. The toilet was situated in the corner of the room used for the BATs and exposure session, and was used as the stimulus for both of these tasks. It is worth noting that many other studies investigating distraction during exposure have utilized the same stimulus for the exposure session and BATs (e.g., Mohlman & Zinbarg, 2000; Rodriguez & Craske, 1995; Telch et al.,

2004). To measure behavioural approach, a hierarchy of steps was used that included first approaching and later touching different parts of the toilet (see Appendix A).

Procedure. Participants completed a screening measure either online or over the phone in order to assess their potential eligibility. The screening measure included eight short vignettes related to situations or objects that individuals might fear (e.g., spiders, heights), one of which was a contaminated stimulus. Each vignette was followed by a number of questions assessing related anxiety and behavioural avoidance. In order to meet eligibility criteria, participants were required to (1) indicate responses exceeding specific predetermined values for the contamination vignette of the screening questionnaire (i.e., must have reported at least mild anxiety, mild unwillingness to approach, and moderate unwillingness to touch the contaminant), and (2) ultimately complete no more than 32 steps during their first BAT assessment (see below). Participants attended two visits separated by one week. The first visit consisted of informed consent, completing baseline questionnaires assessing various symptoms of psychopathology, a pre-exposure BAT (at which time final eligibility was confirmed), an exposure session, post-exposure questionnaires regarding the exposure experience, a post-exposure BAT, and a final set of questionnaires. The second visit consisted of questionnaires upon arrival, a follow-up BAT, and completion of a final battery of questionnaires.

Experimental conditions. Participants were randomly assigned to one of four conditions: no, low, moderate, or high distraction. The tasks used in the distraction conditions were determined in Experiment 1. Specifically, the low distraction task included repeating words back to the experimenter, the moderate distraction task included a guided conversation, and the high distraction task was the same as the moderate task except participants were also asked to say "three" after every third word. Instructions regarding the purpose of the exposure session and the exposure format were the same across conditions, including the request to maintain visual focus on the stimulus throughout the exposure. No specific information about distraction or attention was provided in the rationale. Condition-specific instructions about the distraction task (if relevant) were provided following randomization.

Exposure session. The exposure session was 20 minutes and self-paced (i.e., the participant decided if and when to proceed). The exposure session typically began at the last step the participant had completed during the pre-exposure BAT, although all participants were given the option of starting at a lower step if they desired. The exposure session was designed to

be sufficiently long to allow for learning to occur, including the potential violation of expectations (e.g., Craske et al., 2014), depending on fear content. Many other studies of distraction use in exposure have utilized exposure sessions of similar length, many of which have utilized exposure sessions 15 minutes or less in duration (e.g., Garcia-Palacios et al., 2007; Haw & Dickerson, 1998; Johnstone & Page, 2004; Rodriguez & Craske, 1995). Participants were asked to indicate their anxiety level every two minutes, and BAT distance was also recorded at these intervals. Possible exposure steps paralleled the BAT steps, and participants were instructed to inform the experimenter if they wished to continue in order to be provided with the next step. Additionally, if a participant reported a SUDS level of less than 40 they were provided with the next step, but were informed that they could choose whether or not they wished to move forward.

BAT Assessments. All BATs were conducted by a trained research assistant who was blind to condition assignment. The BAT was discontinued when participants indicated that they no longer wanted to continue, at which point anxiety level was assessed. If a SUDS rating of 30 or below was provided, the research assistant asked if they would be willing to continue, but participants were also given a clear option of maintaining their decision to discontinue the task.

Results

Baseline data screening. No outliers were identified on any major outcome variables. Additionally, there were no baseline differences on any relevant questionnaires.

Previous treatment. A total of 26 individuals (21%) reported having taken medication for psychological problems, and 42 individuals (34%) reported previous psychotherapy. Of these 42 individuals, eight (7% of the overall sample) described receiving treatment that met criteria for previous CBT, four of which received this treatment for difficulties with anxiety. There were no differences between conditions in terms of previous treatment (psychopharmacological, general psychotherapy, or CBT; all χ^2's < 4.81, all p's > .187).

Manipulation checks. A blind rater listened to 40-second segments of each audio-recorded exposure session and predicted condition assignment. When comparing predicted condition to actual condition assignment, all (100%) were correctly classified.

One-way ANOVAs were conducted to investigate differences between conditions on variables assessing cognitive load and attention. In terms of visual attention, there were no differences between conditions, $F(3, 123) = 1.57$, $p = .201$, partial $\eta^2 = .04$. For cognitive load,

differences were only investigated between conditions using distraction tasks, as the items were not relevant to the no distraction condition. There were significant differences between conditions, $F(2, 90) = 29.30$, $p < .001$, partial $\eta^2 = .39$, with follow-up analyses with a Bonferroni correction showing significantly greater cognitive load in the high condition compared to the low and moderate conditions (p's $< .001$), and a trend towards greater cognitive load in the moderate condition compared to the low condition ($p = .056$). Finally, the use of other distraction techniques was significantly different between conditions, $F(3, 123) = 7.88$, $p < .001$, partial $\eta^2 = .17$. Specifically, the control condition had significantly higher scores than both the moderate and high conditions, and the low condition had significantly higher scores than the high condition.

Changes in behavioural approach. Mixed 2 (time) by 4 (condition) ANOVAs were conducted to assess change in number of BAT steps completed from pre- to post-exposure and from post-exposure to one-week follow-up (see Figure 3); these analyses were conducted separately given that the rate of change for each time frame was expected to differ. For pre- to post-exposure there was a main effect of time, $F(1, 120) = 125.27$, $p < .001$, partial $\eta^2 = .51$, with an increase in BAT steps completed regardless of condition. However, there was no time by condition interaction, $F(3, 120) = 1.89$, $p = .134$, partial $\eta^2 = .05$. Although the interaction was not significant, it is worth noting that when considering individual effect sizes for change in BAT steps by condition, the effect size for the high distraction condition ($d = 0.80$) was much lower than the effect sizes for the control, low, and moderate conditions ($d = 1.45$, 1.27, and 1.37, respectively). For changes in behavioural approach from post-exposure to one-week follow-up there was a significant main effect of time, $F(1, 117) = 20.01$, $p < .001$, partial $\eta^2 = .15$, indicating that all conditions continued to improve; however, there was not a significant time by condition interaction, $F(3, 117) = 0.22$, $p = .882$, partial $\eta^2 = .01$. In this case, the effect size for change by condition was slightly smaller in the moderate condition ($d = 0.21$) compared to the control, low, and high conditions ($d = 0.52$, 0.52, and 0.61, respectively).

Self-report symptom measures. A mixed 2 (time) by 4 (condition) ANOVA was conducted in order to assess for changes in self-reported contamination fear using the VOCI-CTN. The two time points were pre-exposure (i.e., baseline) and one-week follow-up. For VOCI-CTN scores there was trend toward a main effect of time, $F(1, 120) = 3.77$, $p = .055$,

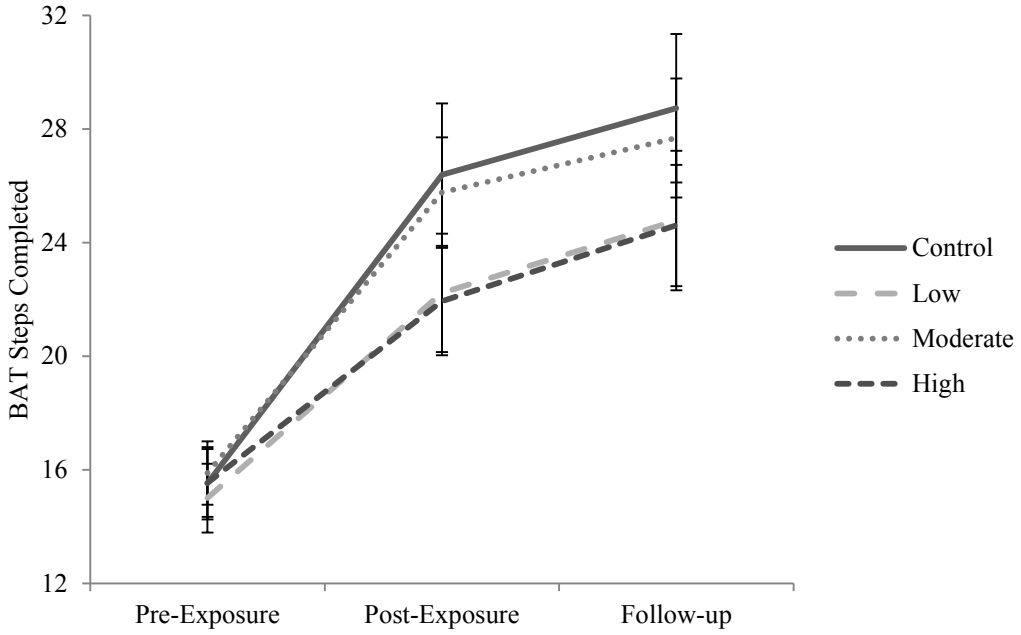

Figure 3. Behavioural approach by condition and time in Experiment 2; BAT = Behavioural Approach Test. Error bars are standard errors.

partial $\eta^2 = .03$, with scores reducing over the course of the study regardless of condition, but there was no significant time by condition interaction, $F(3, 120) = 1.06$, $p = .369$, partial $\eta^2 = .03$.

Changes in self-efficacy. Changes in self-efficacy (i.e., SEQ scores) were evaluated pre- to post-exposure and post-exposure to one-week follow-up using mixed 2 (time) by 4 (condition) ANOVAs. For pre- to post-exposure, there was a main effect of time, $F(1, 120) = 43.11$, $p < .001$, partial $\eta^2 = .26$, with all conditions showing an increase in self-efficacy over time. Additionally, there was a significant time by condition interaction, $F(3, 120) = 3.40$, $p = .020$, partial $\eta^2 = .08$, with individuals in the moderate condition showing a greater increase in self-efficacy scores (see Figure 4). Simple effects analyses showed a significant increase in self-efficacy in all conditions except the low condition, and the largest pre- to post-exposure effect size was in the moderate condition ($d = 0.98$). The control and high conditions had comparable effect sizes ($d = 0.52$ and 0.58, respectively), and the low condition had the smallest effect size ($d = 0.28$). When considering post-exposure to one-week follow-up, there was no main effect of time, $F(1, 117) = 0.07$, $p = .793$, partial $\eta^2 = .003$, and no significant interaction, $F(3, 117) = 0.65$, $p = .582$, partial $\eta^2 = .02$.

Treatment acceptability. To investigate differences in treatment acceptability, a one-way between-participants ANOVA was conducted using TAAS scores as the outcome variable. There was a significant difference between conditions, $F(3, 123) = 7.23$, $p < .001$, partial $\eta^2 = .15$ (see Figure 5). Post-hoc comparisons using a Bonferroni correction showed that the moderate condition rated treatment acceptability significantly higher than the control ($p = .013$) and low ($p < .001$) conditions. Additionally, the high distraction condition showed significantly higher acceptability ratings than the low distraction condition ($p = .013$).

Discussion

This study investigated the impact of differing levels of distraction on exposure outcome in a contamination-fearful sample, and the impact of distraction use on treatment acceptability and changes in self-efficacy. The three distraction conditions (low, moderate, and high distraction) were previously established as having differing levels of cognitive load (see Experiment 1). Contrary to our hypothesis, there were no significant differences between conditions (no, low, moderate, or high distraction) in change in behavioural approach following an exposure session or at one-week follow-up; however, effect sizes indicated less improvement following exposure in the high distraction condition. Consistent with hypotheses, increases in

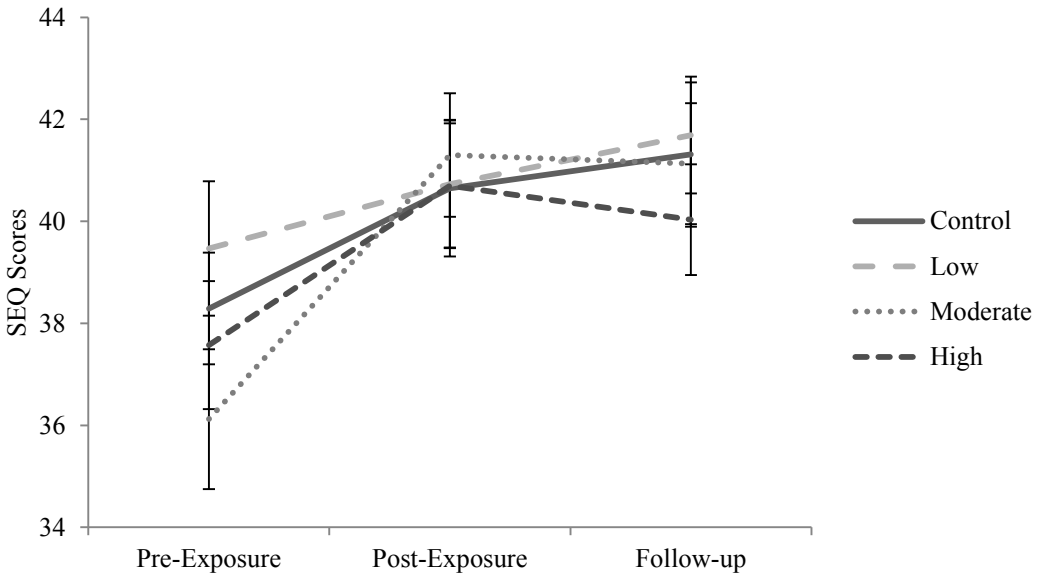

Figure 4. Self-efficacy scores by condition and time in Experiment 2; SEQ = Self-Efficacy Questionnaire for Phobic Situations. Error bars are standard errors.

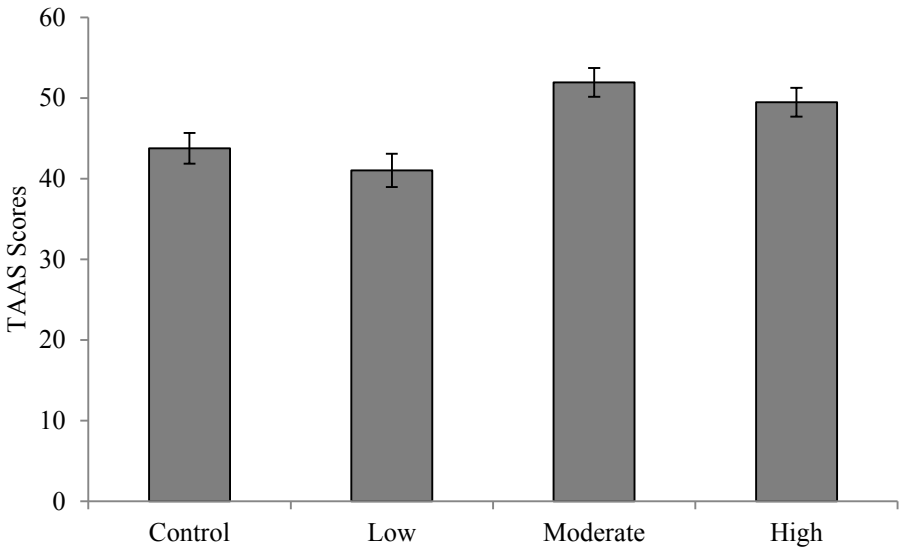

Figure 5. Treatment acceptability scores by condition in Experiment 2; TAAS = Treatment Acceptability and Adherence Scale. Error bars are standard errors.

self-efficacy following exposure were greatest in the moderate distraction condition, and treatment acceptability ratings were greatest in conditions utilizing moderate or high levels of distraction. Overall, no statistically significant differences were observed in terms of exposure outcome (or changes in contamination fear symptomatology) based on condition, supporting the notion that distraction may not interfere with exposure. Additionally, these results provide preliminary evidence that distraction use during exposure may increase treatment acceptability and aid in increasing self-efficacy.

There are some potential limitations that should be considered when interpreting the current results. For example, although the exposure session was structured to be self-paced to increase ecological validity, this likely increased the probability that participants approached the tasks differently. All participants were asked to inform the experimenter if they were ready to proceed; however, participants in the control condition were far more likely to request the next step (as assessed by a blind coder who listened to the audio-recorded exposure sessions), likely due to the fact that they were not completing a concurrent task. This may have related to boredom, or alternatively, it is possible that individuals in distraction conditions did not make such requests as often as they would have if they had not been completing a concurrent task, thereby altering the progression of exposure. Additionally, due to variable starting points and no requirement to move forward when anxiety was at a certain level, the exposure experience differed across participants. For example, while some refused to move forward when their anxiety was very low, others with very high anxiety continued to request and complete additional steps. Again, design decisions were made with the intention of maintaining ecological validity, yet this inherently reduced controllability of each individual's experience. It is therefore possible that a different design investigating a similar research question may produce different results.

There are a number of other limitations to consider. First, although participants were screened for high levels of fear, they were not assessed for clinical severity, nor were they treatment-seeking. Therefore, generalizability to a clinical treatment-seeking sample is unclear. Additionally, only one specific type of anxiety was investigated, namely contamination fear. It is possible that habituation of fear occurs at different rates for various types of anxiety, and that differences may have emerged with another type of fear, such as a specific phobia. However, we chose to examine contamination fear because many of the studies in this area have been conducted with specific phobias, and we strived to expand this work to other (perhaps more

complex) fears. Additionally, specific instructions regarding distraction use (or lack thereof) were not provided to the control condition in order to allow this condition to represent exposure as usual; unfortunately individuals in this condition therefore often utilized distraction techniques without being specifically instructed to do so. Given that individuals in the control condition often utilized their own distraction techniques ($M = 4.97$, $SD = 2.81$; 0 to 9 scale assessing frequency of use), comparisons with the instructed distraction conditions are essentially less strong. However, the vast majority of studies on distraction using an exposure do not provide instructions regarding attentional focus in exposure-only conditions (e.g., Kamphuis & Telch, 2000; Oliver & Page, 2008; Rodriguez & Craske, 1995; Telch et al., 2004). It is also worth noting that the internal consistencies of self-reported cognitive load and visual attention in Experiment 2 were low ($\alpha = .61$ and .65, respectively). Finally, the same stimulus was utilized for the BAT assessments and the exposure session, which has been done in other distraction studies (e.g., Mohlman & Zinbarg, 2000; Rodriguez & Craske, 1995; Telch et al., 2004) but nonetheless limits our ability to observe general changes in contamination fear. Notwithstanding the above limitations, the results remain promising and informative.

Given our findings, the level of distraction used in treatment may simply not be important to exposure outcome. Discrepant findings in the extant distraction literature shaped our hypothesis due to the wide range of distraction tasks employed. However, it is possible that other factors may be more important to whether or not distraction is helpful or harmful during exposure. Specifically, it is possible that distraction task properties (e.g., interest in the task, personal relevance, etc.) or individual differences (e.g., personality, coping style, etc.) may help explain previous mixed findings. Similarly, beliefs about distraction may play an important role in the degree to which distraction aids or detracts from exposure efficacy (Senn & Radomsky, in press). Additionally, it may be important to consider cognitive versus visual distraction. In the current study, cognitive attention was manipulated while visual attention was maintained across conditions (supported by self-reported ratings of cognitive and visual attention). In many other distraction studies reporting favourable outcomes related to distraction use, visual attention was maintained (e.g., Craske, Street, Jayaraman, & Barlow, 1991; Johnstone & Page, 2004; Oliver & Page, 2003, 2008). Furthermore, in many studies with negative effects of distraction, visual attention was not maintained in the distraction condition (e.g., Grayson, Foa, & Steketee, 1982; Schmid-Leuz, Elsesser, Lohrmann, Jöhren, & Sartory, 2007), or participants were specifically

requested to visually focus on the distractor (e.g., Rodriguez & Craske, 1995). It is therefore possible that the level of cognitive load of a distraction task is less important than visual attention to the feared stimulus, or that these two factors may interact. One study conducted by Mohlman and Zinbarg (2000) attempted to assess the importance of both visual and cognitive attention through manipulating both factors. They found that presence of both types of attention was related to lower fear ratings during a post-exposure BAT; however, further research may be necessary to further elucidate the impact of these factors. Overall, it is important to continue clarifying the role of various forms of distraction (or individual differences) to aid in our understanding of the existing distraction literature, and to obtain clinically-relevant information regarding how (and for whom) distraction should or should not be utilized during treatment.

In the current study, regardless of distraction level there were no significant differences between conditions for changes in behavioural approach or symptoms of contamination fear. Therefore, although level of distraction did not lead to the hypothesized differences between conditions, there was evidence that distraction may not interfere with exposure outcome (although effect size analyses indicate somewhat less improvement in the high distraction condition). It is additionally worth noting that although differences between conditions were not significant, it appears that the control and moderate distraction conditions fared somewhat better overall. Furthermore, while increased self-efficacy was observed across conditions, and all participants completed a similar exposure exercise with comparable improvement, individuals in the moderate distraction condition experienced greater increases pre- to post-exposure than any other condition. These results further parallel those observed by Johnstone and Page (2004), in which individuals undergoing distracted exposure showed greater increase in self-efficacy pre- to post-exposure than individuals completing focused exposure. Together these findings provide support for the theory that self-efficacy is related to an increased sense of mastery or accomplishment, which may have been impacted by decreased arousal (and therefore greater perceived coping ability) in the moderate distraction condition (Bandura, 1977; 1988). However, future studies should consider assessing whether decreased arousal and increased coping ability are in fact mechanisms that impact greater increases in self-efficacy when distraction is utilized, as this was not directly assessed in the current study.

The current results also provide important insight into the potential acceptability-enhancing role distraction might play in exposure. To our knowledge, the impact of distraction

use on perceived treatment acceptability has not been investigated. Given that treatment refusal and drop-out rates remain high (e.g., Bados, Balaguer, & Saldaña, 2007; Foa et al., 2005), along with the possibility that individuals may be making these decisions based on concerns about the anxiety-provoking nature of exposure (e.g., Veale, 1999), this research area requires further attention. Similar treatment acceptability research has been conducted in the area of safety behaviour, but has typically investigated the use of overt safety aids (e.g., wearing gloves or protective gear) rather than looking at distraction, a more covert form of safety behaviour. In the safety behaviour literature, treatment vignettes incorporating the use of safety aids have been rated as more acceptable than those that discourage the use of safety behaviour (Levy, Senn, & Radomsky, 2014; Milosevic & Radomsky, 2013a), and the same pattern was observed in an experimental study with an unselected student sample (Levy & Radomsky, 2014). Of note, experimental studies have also been conducted to assess the impact of safety behaviour use on exposure outcome, many of which have found that safety behaviour use does not necessarily impact outcome negatively (e.g., Hood, Antony, Koerner, & Monson, 2010; Milosevic & Radomsky, 2013b). The results of the current study parallel the treatment acceptability findings detailed above in that individuals who used a substantial amount of distraction during exposure (i.e., at least a moderate level) rated the treatment component they completed (e.g., the exposure session) as more acceptable than individuals who were not instructed to use distraction or who used very minimal distraction. Importantly, it has been suggested that the use of distraction techniques or safety behaviour during the initial stages of treatment may aid in increased treatment engagement (e.g., Parrish, Radomsky, & Dugas, 2008; Rachman, Radomsky, & Shafran, 2008). .

It is worth noting that one participant in the control condition dropped out of the study during the exposure because they were too anxious to continue. When this participant was debriefed about the purpose of the study, they said “I could have done it if I had been distracted”. Others in the control condition often stated they wished they had been in a distraction condition, or similarly, that they would have completed more steps if they had been distracted. Individuals in the moderate and high distraction conditions often provided unsolicited comments stating how helpful the distraction was, including comments such as “the conversation made me feel relaxed and made me feel like I could do it – now I can continue to confront my fears because I know it isn’t a big deal”. Notably, there is some anecdotal support that high levels of distraction may

have led to individuals feeling distanced from the exposure (e.g., "that really worked, I totally forgot my hand was even on the toilet"). These comments as a whole support the notion that participants found the treatment more acceptable when distracted, and that many individuals in the control condition were disappointed that they were not provided with a distraction task.

While distraction may aid in increasing treatment acceptability, it remains important to discern whether there are certain circumstances under which distraction should or should not be used. These circumstances may theoretically relate to either the type of distraction used or to individual differences between clients. In other words, it is possible that for certain individuals the use of distraction during the initial stages of treatment to help increase acceptability and self-efficacy may be useful and even encouraged, whereas for other individuals this may be discouraged. Additionally, certain types of distraction may be more useful than others. The current study utilized verbal tasks because we thought the task used in the condition we hypothesized would perform best (i.e., moderate distraction) could easily be implemented in clinical practice, and also because it paralleled tasks used in previous studies with positive outcomes for distraction use (e.g., Oliver & Page, 2003); however, other types of distraction may lead to different results. Additionally, it may be useful to understand whether the role of distraction differs when it is used during encoding, extinction, or during post-event processing. In summary, more research will aid in further elucidating when, how, and for whom distraction may be useful. However, given that the use of distraction during exposure may not necessarily be harmful and that its use may increase perceived acceptability of treatment, its potential utility within the context of exposure may have important clinical implications.

CHAPTER 5

Impact of Beliefs about Distraction on Exposure Outcome

The purpose of this chapter is to briefly address the intersection between the development of the Beliefs about Distraction Inventory (BADI; see Chapter 2) and the experimental study investigating the use of distraction during exposure (see Chapter 4). Due to the fact that this document is a manuscript-based thesis, these analyses were not able to be included in the second manuscript due to journal-related space restrictions. However, the following investigation and associated results will be incorporated into a separate manuscript to be submitted for publication in the future.

Background Information

The BADI was developed in order to provide a psychometrically-sound measure of maladaptive beliefs about distraction, and to allow for the use of such a measure in future studies including those evaluating distraction use during exposure. The beliefs an individual holds about the function distraction serves when confronted with anxiety-provoking situations may be important to consider in the context of exposure (both with and without distraction). It has been suggested that the coping strategies an individual tends to utilize when anxious may be more important to exposure outcome than whether or not distraction is used (Rodriguez & Craske, 1993), which may indicate that the use or reliance upon specific strategies may be an important area of investigation. Furthermore, it has been proposed that whether or not an action can be classified as adaptive coping or maladaptive avoidance may relate to the function of the action for the individual, or in other words the beliefs an individual holds about the utility of using such strategies (e.g., Helbig-Lang & Petermann, 2010; Thwaites & Freeston, 2005). In the context of treatment, it is possible that if an individual holds strong maladaptive beliefs about distraction (i.e., that distraction is essential to cope with anxiety), this may interfere with treatment, and it may therefore be ideal to discourage the use of distraction for this individual. On the other hand, if an individual does not typically rely on distraction, it may not be detrimental for this individual to use distraction during exposure. In other words, it is possible that beliefs about distraction may be an important guide to determining whether to incorporate distraction during exposure. Importantly, these beliefs may in fact better predict improvement following distracted exposure than simply whether or not distraction is used. This individual difference could theoretically

lead to quite different treatment recommendations that thus far have not been sufficiently considered or addressed.

Through the development and validation of the BADI a two-factor structure was established, with one factor reflecting that "distraction is necessary" (BADI-N) and one reflecting that "distraction is effective" (BADI-E). Importantly, in both the exploratory factor analysis sample and a subclinical confirmatory factor analysis sample, the BADI-N subscale showed stronger significant correlations with anxious symptomatology than the BADI-E subscale. This may indicate that the belief that distraction is necessary, or reliance upon distraction to cope with anxiety, is more maladaptive and associated with psychopathology than simply the belief that distraction can be useful or effective, which may alternatively be associated with the use of distraction as more of an adaptive coping strategy. However, it is important to experimentally assess the impact these beliefs have on exposure outcome, both in general and when distraction is utilized; this was the focus of the current preliminary investigation. It was hypothesized that maladaptive beliefs about distraction would predict less improvement following exposure when distraction (at either moderate or high levels) was utilized. Due to the greater associations of BADI-N scores with psychopathology, it was also predicted that these subscale scores would be more strongly related to worse exposure outcome than BADI-E scores. Overall, maladaptive beliefs about distraction were hypothesized to negatively impact an individual's ability to improve over the course of an exposure session when at least moderate levels of distraction were employed.

Method

Participants. Contamination-fearful participants were recruited as part of a larger study (see Chapter 4, Experiment 2). A total of 124 individuals were eligible to complete the aforementioned study and were therefore included in the current analyses. The mean age of the sample was 24.85 (*SD* = 8.29) years, 92% was female, and 52% self-identified as Caucasian.

Measures

Beliefs about Distraction Inventory (BADI; Senn & Radomsky, in press). The BADI is a 24-item scale that measures the beliefs an individual holds about distraction. The BADI consists of two subscales: Distraction is Necessary (BADI-N) and Distraction is Effective (BADI-E). Individuals respond using a 7-point Likert-type scale (1 = *disagree very much* and 7 = *agree very much*). In the current sample, the internal consistency of the BADI was $\alpha = .96$.

Behavioural Approach Test (BAT). The BAT was used as behavioural measure of fear, and involved approaching a "dirty" toilet. For details, please see Chapter 4 (Experiment 2).

Subjective Units of Distress Scale (SUDS; Wolpe, 1958). The SUDS was used to assess self-reported anxiety at the highest BAT step completed, both pre- and post-exposure. Participants were asked to provide a number from 0 ("*no anxiety whatsoever*") to 100 ("*the worst anxiety imaginable*") to indicate their current level of distress.

Procedure. The aforementioned hypothesis was tested using the same experimental paradigm and design detailed in the exposure-based experiment of this research program, namely Experiment 2 of Chapter 4 (see above). Briefly, contamination-fearful participants (i.e., a subclinical sample) completed a brief exposure session with either no, low, moderate, or high distraction. Behavioural approach was measured via a BAT before and after the exposure session, and SUDS ratings were obtained at the highest step reached during each BAT. The BADI was administered at baseline, prior to the experimental manipulation.

Results

To test the hypothesis that maladaptive beliefs about distraction (i.e., higher scores on the BADI) would be related to less improvement following exposure in conditions utilizing distraction, hierarchical linear regressions were conducted for each condition. The outcome variable was the number of BAT steps completed post-exposure, and the predictor variables were BAT steps completed pre-exposure (Step 1), and BADI-N and BADI-E subscale scores (together in Step 2). Pre-exposure BAT steps were entered as a predictor to account for initial fear level (i.e., behavioural approach). The addition of BADI scores in Step 2 did not account for additional variance in the control, low, or high distraction conditions (see Tables 6, 7, and 8, respectively). The only condition for which BADI scores accounted for significant added variance in the model was the moderate distraction condition (see Table 9), suggesting that a negative impact of maladaptive beliefs about distraction was only present when moderate levels of distraction were utilized. Importantly, the association was negative in that higher BADI scores related to fewer post-exposure BAT steps completed, after controlling for pre-exposure BAT steps.

It was predicted that high scores on the BADI-N subscale may be more detrimental to treatment outcome (due to the association with psychopathology) than high scores on the BADI-E subscale. Accordingly, BADI-N and BADI-E subscale scores were entered within the same

Table 6

Hierarchical Multiple Regression Analysis of Predictors of Post-Exposure BAT Steps in the Control Condition

	Model 1			Model 2		
	B	*SE B*	β	*B*	*SE B*	β
Step 1						
Pre-Exposure BAT	1.44	0.25	.73***	1.29	0.29	.66***
Step 2						
BADI-N				-0.12	0.14	-.20
BADI-E				0.05	0.39	.03
R^2		.53			.56	
ΔR^2		.53			.03	
F-change		33.00***			0.88	

Note. BAT = Behavioural Approach Test; BADI-N = Distraction is Necessary Subscale of the Beliefs about Distraction Inventory; BADI-E = Distraction is Effective Subscale of the Beliefs about Distraction Inventory; ***$p < .001$.

Table 7

Hierarchical Multiple Regression Analysis of Predictors of Post-Exposure BAT Steps in the Low Distraction Condition

	Model 1			Model 2		
	B	*SE B*	β	*B*	*SE B*	β
Step 1						
Pre-Exposure BAT	1.38	0.20	.80***	1.38	0.20	.80***
Step 2						
BADI-N				0.01	0.09	.02
BADI-E				-0.23	0.25	-.13
R^2		.64			.66	
ΔR^2		.64			.02	
F-change		49.81***			0.55	

Note. BAT = Behavioural Approach Test; BADI-N = Distraction is Necessary Subscale of the Beliefs about Distraction Inventory; BADI-E = Distraction is Effective Subscale of the Beliefs about Distraction Inventory; ***$p < .001$.

Table 8

Hierarchical Multiple Regression Analysis of Predictors of Post-Exposure BAT Steps in the High Distraction Condition

	Model 1			Model 2		
	B	*SE B*	β	*B*	*SE B*	β
Step 1						
Pre-Exposure BAT	0.89	0.25	.56**	0.73	0.28	.46*
Step 2						
BADI-N				-0.09	0.09	-.23
BADI-E				-0.01	0.28	-.01
R^2		.31			.36	
ΔR^2		.31			.05	
F-change		12.56**			0.91	

Note. BAT = Behavioural Approach Test; BADI-N = Distraction is Necessary Subscale of the Beliefs about Distraction Inventory; BADI-E = Distraction is Effective Subscale of the Beliefs about Distraction Inventory; *$p < .05$; **$p < .01$.

Table 9

Hierarchical Multiple Regression Analysis of Predictors of Post-Exposure BAT Steps in the Moderate Distraction Condition

	Model 1			Model 2		
	B	*SE B*	β	*B*	*SE B*	β
Step 1						
Pre-Exposure BAT	1.10	0.25	.63***	0.91	0.22	.52***
Step 2						
BADI-N				-0.07	0.08	-.15
BADI-E				-0.63	0.32	-.34†
R^2		.39			.58	
ΔR^2		.39			.19	
F-change		20.05***			6.68**	

Note. BAT = Behavioural Approach Test; BADI-N = Distraction is Necessary Subscale of the Beliefs about Distraction Inventory; BADI-E = Distraction is Effective Subscale of the Beliefs about Distraction Inventory; †$p < .10$; **$p < .01$; ***$p < .001$.

step in the above regressions in order to understand the contribution of each of these subscales. In the control, low, and high distraction conditions the contribution of the subscales did not differ significantly (see Tables 6, 7, and 8, respectively). However, in the moderate distraction condition, the BADI-E subscale showed a trend towards significance while the BADI-N subscale did not (see Table 9). Therefore, the BADI-E subscale may be more important to the association between BADI scores and exposure outcome than BADI-N scores.

Finally, the impact of BADI scores on change in anxiety (at the highest BAT step reached; SUDS) from pre- to post-exposure was examined. Hierarchical linear regressions similar to those detailed above were conducted, with post-exposure SUDS as the outcome variable, pre-exposure SUDS as Step 1, and BADI-N and BADI-E scores together as Step 2. The addition of BADI scores to the model accounted for additional variance in post-exposure SUDS in the control and low conditions such that higher BADI scores were related to higher anxiety (see Tables 10 and 11, respectively). This relationship was not observed in the moderate or high conditions (see Tables 12 and 13, respectively). Interestingly, for both the control and low distraction conditions, the contribution from the BADI-E subscale was stronger than that of the BADI-N subscale (see Tables 10 and 11).

Discussion

The aim of this investigation was to understand the role maladaptive beliefs about distraction may play in exposure outcome. Overall it appeared that stronger maladaptive beliefs about distraction were associated with less improvement over the course of an exposure session when a moderate level of distraction was utilized. It was hypothesized that maladaptive beliefs about distraction would impact outcome with moderate or high levels of distraction. It is puzzling that the observed relationship was only present with a moderate level of distraction rather than with any distraction use; however, given that effect sizes showed less improvement in the high distraction condition (See Chapter 4), it is possible that this relationship may not have been observable due to less improvement in general (i.e., less variance). It is also possible that the type and level of distraction that was employed in the moderate condition (i.e., a conversation) was more similar to the typical distraction strategies an individual might use, and thus more relevant to their beliefs. Therefore, in the moderate condition, individuals who held beliefs that distraction is useful in coping with anxiety may have done more poorly because they

Table 10

Hierarchical Multiple Regression Analysis of Predictors of Post-Exposure SUDS in the Control Condition

	Model 1			Model 2		
	B	*SE B*	β	*B*	*SE B*	β
Step 1						
Pre-Exposure SUDS	0.78	0.17	.65***	0.60	0.18	.50**
Step 2						
BADI-N				-0.07	0.28	-.05
BADI-E				1.65	0.80	.43*
R^2		.42			.55	
ΔR^2		.42			.13	
F-change		20.90***			3.83*	

Note. SUDS = Subjective Units of Distress Scale; BADI-N = Distraction is Necessary Subscale of the Beliefs about Distraction Inventory; BADI-E = Distraction is Effective Subscale of the Beliefs about Distraction Inventory; *$p < .05$; **$p < .01$; ***$p < .001$.

Table 11

Hierarchical Multiple Regression Analysis of Predictors of Post-Exposure SUDS in the Low Distraction Condition

	Model 1			Model 2		
	B	*SE B*	β	*B*	*SE B*	β
Step 1						
Pre-Exposure	0.62	0.17	.56**	0.51	0.17	.46**
SUDS						
Step 2						
BADI-N				0.07	0.25	.05
BADI-E				1.46	0.74	.36†
R^2		.31			.45	
ΔR^2		.31			.14	
F-change		12.63**			3.29†	

Note. SUDS = Subjective Units of Distress Scale; BADI-N = Distraction is Necessary Subscale of the Beliefs about Distraction Inventory; BADI-E = Distraction is Effective Subscale of the Beliefs about Distraction Inventory; † $p < .10$; ** $p < .01$.

Table 12

Hierarchical Multiple Regression Analysis of Predictors of Post-Exposure SUDS in the Moderate Distraction Condition

	Model 1			Model 2		
	B	*SE B*	β	*B*	*SE B*	β
Step 1						
Pre-Exposure SUDS	0.46	0.19	.40*	0.40	0.24	.34
Step 2						
BADI-N				-0.23	0.32	-.17
BADI-E				1.17	1.37	.22
R^2		.16			.18	
ΔR^2		.16			.02	
F-change		5.75*			0.39	

Note. SUDS = Subjective Units of Distress Scale; BADI-N = Distraction is Necessary Subscale of the Beliefs about Distraction Inventory; BADI-E = Distraction is Effective Subscale of the Beliefs about Distraction Inventory; *$p < .05$.

Table 13

Hierarchical Multiple Regression Analysis of Predictors of Post-Exposure SUDS in the High Distraction Condition

	Model 1			Model 2		
	B	*SE B*	β	*B*	*SE B*	β
Step 1						
Pre-Exposure SUDS	0.57	0.20	.47**	0.52	0.23	.43*
Step 2						
BADI-N				0.03	0.25	.03
BADI-E				0.29	0.79	.09
R^2		.22			.23	
ΔR^2		.22			.01	
F-change		8.04**			0.17	

Note. SUDS = Subjective Units of Distress Scale; BADI-N = Distraction is Necessary Subscale of the Beliefs about Distraction Inventory; BADI-E = Distraction is Effective Subscale of the Beliefs about Distraction Inventory; * $p < .05$; ** $p < .01$.

were afforded the opportunity to use a strategy that they believe is helpful. In this case, learning that distraction is not in fact necessary to cope with anxiety did not occur.

Given that previous investigations indicated that the BADI-N subscale appears to be more associated with psychopathology than the BADI-E subscale, it was predicted that BADI-N scores would be more related to a negative impact of beliefs on outcome than BADI-E scores. Contrary to hypothesis, examination of the contributions of each of these subscales (BADI-N and BADI-E) to the significant result in the moderate distraction condition showed that the BADI-E subscale had a greater impact (at a trend level). In other words, when moderate distraction was utilized, holding stronger beliefs that distraction is effective was related to less improvement. This result is surprising given the fact that BADI-N scores seem to be more related to psychopathology; however, it remains possible that beliefs that distraction is necessary and is effective may both negatively impact exposure progression. It is also possible that while BADI-N subscale scores are more associated with psychopathology in general, BADI-E subscale scores may be more related to treatment progression. For example, if an individual believes that distraction is an effective anxiety reduction technique and is permitted to use distraction, they may be more likely to attribute the success of the exposure to the use of distraction than they would if they did not believe that distraction was effective. Interestingly, misattribution of success to another action (rather than the exposure itself) has been theorized by some to lead to less overall improvement in treatment (e.g., Salkovskis, 1991).

When investigating the impact of BADI scores on changes in anxiety pre- to post-exposure, BADI scores were significantly related to anxiety in the control and low distraction conditions. Specifically, in both the control and low conditions having higher BADI scores related to greater post-exposure anxiety levels, and this relationship was stronger for BADI-E scores than BADI-N scores. In other words, individuals who believe that distraction is effective but were not provided with a distraction task (or were provided with a minimally distracting task) reported higher anxiety levels following exposure. When individuals believe that distraction works and are not allowed to sufficiently distract themselves, they may remain more anxious because they are unable to use a strategy that they consider to be useful. However, more research needs to be conducted in order to better understand this relationship.

It is worth noting that design-related issues may have impacted the current results (see Chapter 4 for details). It is also important to note that the version of the BADI administered in

this study was comprised of all 43 items that were in the unaltered version of the BADI, but only the items retained following factor analysis were included in the analyses for the current study. Therefore, it is important to assess the psychometric properties and impact of BADI scores when the final version of the measure is administered. However, these results provide important insight into the possibility that maladaptive beliefs about distraction may in fact impact treatment under certain conditions.

It is important to continue evaluating the impact of beliefs about distraction on treatment, especially with a clinical or treatment-seeking sample. The results of the current study suggest that when moderate levels of distraction are utilized, individuals with greater maladaptive beliefs about distraction may not improve as much following exposure. It would be useful to see if this is true for all forms of distraction as well as whether the distraction strategy that is used is one that the individual uses on a regular basis. Specifically, it is possible that allowing the use of an individual's typical distraction strategies may be more problematic than allowing the use of a novel distraction task. Indeed, a recent study on the use of typically-used versus novel safety aids in exposure for contamination fear showed greater improvement when novel safety aids were utilized (Levy & Radomsky, under review). Future studies may also be helpful in understanding the differing contributions of the BADI-N and BADI-E subscales both in terms of exposure outcome and self-reported anxiety.

CHAPTER 6

General Discussion

The purpose of this research program was to investigate potential factors that may impact whether the use of distraction during exposure helps or hinders treatment outcome and acceptability. The impetus for this research was the discrepant findings in the literature investigating the use of distraction during exposure, and the difficulty evaluating these results due to vast differences in experimental protocols and distraction tasks across studies (Podină et al., 2013; Rodriguez & Craske, 1993). The goal was to clarify the role of distraction by aiming to understand under what conditions and for whom distraction may be useful versus harmful. Accordingly, several studies were conducted in order to evaluate two different and potentially relevant factors. The first study aimed to develop a psychometrically-sound measure of maladaptive beliefs about distraction, as individual differences in reliance upon distraction may be an important construct to evaluate. This study included an exploratory factor analysis with an unselected student sample, as well as a confirmatory factor analysis with a contamination-fearful sample. The second study was comprised of two experiments that together aimed to establish the impact of differing levels of distraction on exposure outcome. The first experiment assessed the level of cognitive load associated with different distraction tasks, and the second experiment incorporated the selected distraction tasks during an exposure session to assess the impact of level of distraction on both outcome and treatment acceptability. Given the suggestion that high levels of distraction may be detrimental to exposure outcome (e.g., Telch et al., 2004), experimentally evaluating the impact of differing levels of distraction on exposure outcome has the potential to aid in further understanding the relevance of this factor to exposure outcome.

Summary of Findings

Study 1. In this study a large unselected undergraduate student sample completed the Beliefs about Distraction Inventory (BADI) and measures assessing similar constructs and general psychopathology. In order to further evaluate the psychometric properties of the BADI in an anxious population, the BADI and a similar battery of questionnaires were also administered to a contamination-fearful sample. An exploratory factor analysis with the unselected student sample revealed a two-factor solution including the Distraction is Necessary subscale (BADI-N) and the Distraction is Effective subscale (BADI-E). The BADI and its subscales exhibited excellent convergent and divergent validity, and were also associated with

measures of general anxious and depressive symptomatology, highlighting the relevance of this construct to psychopathology. Internal consistency was excellent, and retest reliability analyses indicated that scores remained stable over a four week period.

A confirmatory factor analysis conducted with the contamination-fearful sample showed adequate model fit, and similar convergent and divergent validity and associations with psychopathology as those observed in the unselected student sample. Notably, in the unselected student sample the BADI-N factor was more strongly associated with psychopathology than the BADI-E factor, and in the contamination-fearful sample only the BADI-N (not the BADI-E) factor was associated with psychopathology. The findings of this study indicate that the BADI is a reliable and valid measure of maladaptive beliefs about distraction that is associated with psychopathology and can be utilized in future studies to better understand the potential impact of these beliefs on treatment outcome.

Study 2. This study was comprised of two separate experiments that together aimed to evaluate the impact of differing levels of distraction on exposure outcome. In Experiment 1, the cognitive load associated with a number of verbal distraction tasks was evaluated by assessing increases in reaction time (on a simple reaction time task) that resulted from concurrently completing one of five tasks. The amount of cognitive load associated with the verbal tasks followed the hypothesized direction, and tasks with low, moderate, and high levels of cognitive load were identified. These three tasks were selected because they differed significantly from one another in terms of changes in reaction time, and thus were established as having significantly different levels of cognitive load. Importantly, self-reported cognitive load associated with the verbal task was significantly correlated with objective cognitive load (i.e., changes in reaction time when completing the concurrent task), indicating that individuals are relatively accurate at assessing the level of difficulty associated with task completion.

Experiment 2 utilized the varied levels of distraction tasks identified in Experiment 1 to assess the impact of these differing levels of distraction on the outcome of an exposure session. Specifically, contamination-fearful individuals completed a single exposure session with either no, low, moderate, or high distraction. Behavioural approach was assessed pre-exposure, post-exposure, and at one-week follow-up. No significant differences were observed in changes in behavioural approach based on condition, although the effect size for change was much smaller in the high distraction condition than all other conditions. Self-reported symptoms of

contamination fear were also assessed, and although improvement was observed, the improvement was equivalent across conditions. These results are consistent with previous research showing that exposure outcome is similar whether or not distraction is employed (e.g., Antony et al., 2001).

In addition to investigating differences in exposure outcome, this experiment also aimed to evaluate whether the use of distraction would relate to increased treatment acceptability, and whether changes in self-efficacy over the course of exposure would be enhanced by the use of distraction. Results indicated that treatment acceptability was highest in conditions utilizing moderate and high levels of distraction. Furthermore, increases in self-efficacy, although evident in all conditions, were significantly greater in the moderate distraction condition compared to all other conditions. These results suggest that distraction may not interfere with exposure outcome at any level (although high levels of distraction may not be optimal), and that the use of distraction techniques may in fact increase perceived treatment acceptability and willingness to engage in exposure.

Supplemental Study. In order to assess the impact maladaptive beliefs about distraction may have on exposure outcome (either distracted or undistracted), participants in Experiment 2 of Study 2 also completed the BADI. The results of this investigation were presented in a brief supplemental chapter (Chapter 5). Overall, when a moderate level of distraction was utilized, greater maladaptive beliefs about distraction were associated with less improvement over the course of an exposure session. It is therefore possible that maladaptive beliefs about distraction have a negative impact on exposure outcome only when a moderate (and potentially helpful) amount of distraction is utilized, or when such distraction is similar in nature to the typical distraction techniques an individual employs.

Limitations and Strengths

It is of course important to consider the limitations of the current research program when interpreting the results. For example, the exploratory factor analysis conducted for the BADI in Study 1 utilized data from an unselected student sample. Given that individuals with nonclinical levels of anxiety may display different perceptions of distraction use, generalizability to a clinical sample is difficult. This limitation was lessened somewhat by the use of a contamination-fearful sample for the confirmatory factor analysis; however, clinical status was not assessed and this sample was not treatment-seeking. Furthermore, the sample was comprised

of individuals with one specific type of anxiety (contamination fear), which does not readily allow for generalization across different forms of anxiety. Therefore, future studies should confirm the factor structure of the BADI in a mixed clinically anxious sample.

In Study 2, the results of Experiment 1 (the validation of distraction tasks) may have been limited by the simplicity of the reaction time task and by the lack of a no distraction control condition to account for potential fatigue or practice effects. However, given that the aim of the study was to establish differences between tasks, comparison to a control group was not central to the hypotheses. In the exposure component of Study 2 (Experiment 2), the exposure session was designed with ecological validity in mind. Although ecologically valid designs are associated with a number of benefits, the self-paced nature of the exposure session allowed varied approaches to be taken across participants, including significantly more self-directed advances in behavioural steps in the control condition. Additionally, no instructions were provided to individuals in the control condition regarding refraining from distraction use. While this is common practice in distraction studies (e.g., Kamphuis & Telch, 2000; Oliver & Page, 2008; Rodriguez & Craske, 1995; Telch et al., 2004), it allowed for the potential use of distraction techniques in a condition that was meant to be undistracted. Indeed, individuals in this condition reported distracting themselves to a moderate degree. It is also a limitation that, although screened for high levels of fear, the clinical status of participants was not assessed. Thus generalizability to a clinical and treatment-seeking sample is unclear, as is generalizability to types of anxiety other than contamination fear.

Finally, given that the BADI was still being validated and was administered in its original (rather than reduced) form to participants in Study 2, conclusions drawn about the impact of BADI scores on exposure outcome (see Chapter 5) should be interpreted with caution. Future studies should utilize the revised version of the BADI in order to more accurately assess its relationship with exposure outcome. Additionally, the same design concerns detailed above may have impacted the ability to observe differences across conditions with respect to the impact of maladaptive beliefs about distraction. It is possible that a less complex design with fewer conditions (i.e., no distraction versus distraction) would present a more effective method by which to assess the impact of maladaptive beliefs about distraction on treatment outcome.

Although a number of limitations are evident in the present studies, this research program is also characterized by a number of notable strengths. First, the development of a measure to

assess maladaptive beliefs about distraction to this author's knowledge is the first of its kind, and may have important implications for clinical practice. Specifically, the ability to measure these beliefs will allow for a clearer understanding of their relationship to treatment outcome, and therefore help determine whether these beliefs should be targeted directly in treatment. Another notable strength of this research program was the experimental investigation of a factor that has been purported to impact the use of distraction during exposure (e.g., Rodriguez & Craske, 1993, 1995; Telch et al., 2004) but has not yet been tested experimentally, namely the level of cognitive load involved in distraction tasks. Furthermore, the distraction tasks were experimentally validated to establish significant differences in cognitive resources utilized, rather than simply assuming the presence of such differences. This has been one limitation in attempts to evaluate this factor in the extant literature on distraction, as the level of cognitive load of different tasks cannot be retroactively assessed or compared across studies (Podină et al., 2013).

Other strengths of this research program include the effort put forth to maintain ecological validity within the exposure session of Study 2, as well as the selection of distraction tasks that could realistically be utilized in clinical practice. Additionally, the vast majority of prior studies conducted on distraction use during exposure have included participants with either subclinical or clinical levels of fear related to specific phobias, including spiders (Antony et al., 2001; Craske, Street, Jayaraman, & Barlow, 1991; Haw & Dickerson, 1998; Johnstone & Page, 2004; Mohlman & Zinbarg, 2000; Rodriguez & Craske, 1995; Rose & McGlynn, 1997), snakes (Craske, Street, Jayaraman, & Barlow, 1991; Rodriguez & Craske, 1995; Rose & McGlynn, 1997), needles and/or blood (Oliver & Page, 2003, 2008; Penfold & Page, 1999), and enclosed spaces (Garcia-Palacios et al., 2007; Kamphuis & Telch, 2000; Telch et al., 2004; Wood & McGlynn, 2000). The use of a contamination-fearful sample in the current study allowed for further understanding of the role of distraction in fears that may potentially be more complex than specific phobias. Although a number of early studies of distraction were conducted with individuals with contamination-related OCD (e.g., Grayson, Foa, & Steketeee, 1982, 1986), revisiting the use of a contamination-fearful sample with a different protocol (e.g., involving visual focus on the feared stimulus) has been able to provide updated results on the use of distraction in this population.

Theoretical Implications

This body of work adds to our theoretical understanding of the role of distraction during exposure, including its impact on exposure outcome and treatment acceptability. There has been longstanding debate in the literature regarding the use of distraction during exposure, with much disagreement regarding whether distraction helps or hinders treatment (Podină et al., 2013; Rodriguez & Craske, 1993). While numerous theories have suggested that distraction will negatively impact exposure (e.g., Craske et al., 2014; Foa & Kozak, 1986; Rachman, 1980), the results of Study 2 provide support for theories that alternatively suggest that distraction may not interfere with treatment (e.g., Bandura, 1977, 1988; Parrish, Radomsky, & Dugas, 2008; Salkovskis, 1991). Specifically, regardless of the level of distraction employed, participants using distraction and those not using distraction showed similar rates of improvement over the course of an exposure session, and at one-week follow-up (see Chapter 4). Therefore, although full immersion with the exposure stimulus with the aim of emotional processing, focused cognitive attention on the stimulus, and learning new (non-fearful) associations have been proposed as necessary conditions for fear reduction (e.g., Barlow, 1988; Borkovec & Grayson, 1980; Craske et al., 2014; Foa & Kozak, 1986; Rachman, 1980; Watts, 1974), the hypothesized need for full immersion and attention was not supported by the current findings. The results of the current study also parallel those of other studies which have not observed differences in exposure outcome when distraction is or is not utilized (e.g., Antony et al., 2001; Rose & McGlynn, 1997).

It has been suggested that techniques that may be classified as adaptive coping, such as distraction, may not interfere with exposure because they do not directly aim to prevent feared catastrophic outcomes (e.g., Salkovskis, 1991; Salkovskis, Clark, & Gelder, 1996), and thus still allow for belief disconfirmation. Although belief change was not directly assessed in this study, it is likely that some level of belief disconfirmation occurred across conditions, supporting the notion (and cognitive theory) that distraction may not interfere with this process. Although the distinction between adaptive coping and maladaptive avoidance is often a difficult one (Thwaites & Freeston, 2005), a key consideration in making this distinction appears to be the function or intention behind the use of specific strategies (e.g., Helbig-Lang & Petermann, 2010; Thwaites & Freeston, 2005). It may therefore be important to consider the intention behind the use of distraction. In Study 1, a measure of maladaptive beliefs about distraction was created and validated in order to be able to assess the function distraction serves for each individual. Given

that this distinction may hold both theoretical and clinical importance, being able to accurately assess this construct will allow future research to expand our understanding of the impact of such beliefs on treatment outcome. A preliminary analysis of the impact of BADI scores on exposure outcome (see Chapter 5) indicated that individuals with higher maladaptive beliefs about distraction showed less improvement during an exposure session when they utilized a moderate level of distraction. Therefore, it is possible that maladaptive beliefs about distraction may interact with the use of distraction in that individuals who hold these beliefs may show less improvement when these strategies are incorporated in treatment. However, this hypothesis needs to be more directly examined, including with the use of the now-reduced BADI, in order to more clearly examine this relationship.

While individual differences (including beliefs about distraction) may be an important aspect to consider when investigating the impact of distraction on exposure outcome, a number of additional factors may be relevant and warrant further investigation. For example, among others, the type of distraction utilized (e.g., level of distraction intensity, affective valence, whether cognitive versus visual attention is involved), design considerations (e.g., length of exposure, outcome measures, instructions), and nature of the problem being investigated (e.g., type of anxiety disorder or analogue sample being used) may all be relevant factors. In Study 2 the issue of distraction intensity (or cognitive load) was investigated in order to better understand the impact of this factor. Others have suggested the potential importance of distraction intensity (Podină et al., 2013; Rodriguez & Craske, 1993, 1995; Telch et al., 2004), but experimental investigations thus far have not compared multiple level of distraction. However, research investigating the impact of cognitive load in the treatment of PTSD has been conducted, specifically related to understanding the mechanisms involved in EMDR.

While initially puzzling, recent research on EMDR has suggested that the impact of eye movements on improved imaginal exposure outcome in PTSD relates to the cognitive load associated with this action (Engelhard et al., 2010; Engelhard et al., 2011; van den Hout & Engelhard, 2012; van den Hout et al., 2010). Furthermore, the positive impact of cognitive load seems to be optimal when moderate levels are utilized rather than too little or too much cognitive load (e.g., Engelhard et al., 2010; van den Hout et al., 2001). In the current investigation it was therefore predicted that moderate levels of distraction would have a positive impact on exposure outcome, while high levels of distraction may interfere with fear reduction. This hypothesis was

largely unsupported in Study 2, with level of distraction (no, low, moderate, or high) not differentially impacting exposure outcome. This was surprising given that others have found that high levels of distraction impede exposure outcome (e.g., Telch et al., 2004). However, although between-condition comparisons did not reveal differences, within-condition effect sizes for change were lower in the high distraction condition than any other condition, indicating that individuals utilizing high levels of distraction may have exhibited less improvement. This is consistent with existing theories; therefore, future examinations using different experimental protocols would aid in clarifying the impact of high levels of distraction on exposure outcome. It was also surprising that moderate levels of distraction were not associated with greater improvement than a no distraction control; however, design limitations (see above) may be in part responsible for this finding. Alternatively it is possible that distraction intensity is not a relevant factor when considering the implications of distraction use in exposure therapy. Importantly, even at various levels, the use of distraction in this study did not have a statistically negative impact on exposure outcome compared to a no distraction control, supporting previous research showing that distraction is not detrimental to treatment outcome (e.g., Antony et al., 2001). However, as mentioned above, more research needs to be conducted in order to understand the impact of high levels of distraction.

Support for the notion that distraction does not lead to detrimental exposure outcome is also consistent with research investigating the use of safety behaviour during exposure. Safety behaviour includes any action taken, either covert (e.g., distraction) or overt (e.g., the use of protective gear, carrying objects that provide a sense of safety), to protect oneself in an anxiety-provoking situation (e.g., Salkovskis, 1991; Salkovskis, Clark, & Gelder, 1996). Given that distraction is often considered a form of safety behaviour, an examination of the safety behaviour literature is informative. It is worth noting, however, that the studies mentioned below utilized overt safety behaviour (e.g., gloves, other protective clothing, hygienic wipes, etc.). These safety behaviours more directly aim to prevent feared catastrophe than distraction (e.g., Salkovskis, 1991), and are therefore often viewed as more problematic; however, both overt and covert techniques aim to reduce distress to some degree, which explains why they are often pooled conceptually. Importantly, recent research has suggested that the use of safety behaviour does not necessarily interfere with improvement following behavioural experiments or exposure (e.g., Deacon, Sy, Lickel, & Nelson, 2010; Hood et al., 2010; Milosevic & Radomsky, 2008, 2013b;

Rachman, Shafran, Radomsky, & Zysk, 2011; van den Hout, Engelhard, Toffolo, & van Uijen, 2011). Therefore, even the use of overt safety behaviour, which have been theoretically proposed to be more problematic during exposure than distraction (e.g., Salkovskis, 1991), may not be as detrimental to treatment as was once hypothesized.

Another important area of study that has emerged from the safety behaviour literature is that of treatment acceptability. Specifically, research has shown that treatment descriptions that incorporate the use of safety behaviour in early stages of treatment are perceived as more acceptable by undergraduate (Levy, Senn, & Radomsky, 2014; Milosevic & Radomsky, 2013a) and clinically-anxious (Milosevic & Radomsky, 2013a) populations. Furthermore, in an experimental study by Levy and Radomsky (2014), undergraduate participants rated an exposure session as a more acceptable treatment when they utilized safety behaviour compared to when they did not. The results of Study 2 support the theory that the use of safety behaviour may increase treatment acceptability, as the use of moderate or high levels of distraction during exposure was associated with higher acceptability ratings. Not only is it promising that the use of distraction techniques may increase treatment acceptability (especially given that these techniques were not found to interfere with exposure outcome), but this is also the first study to this author's knowledge that has assessed this construct in the context of distraction use rather than safety behaviour more generally.

Another promising finding from Study 2 was that increases in self-efficacy, although present across conditions, were significantly greater in the moderate distraction condition. This is consistent with previous research showing greater increases in self-efficacy when comparing distraction use to focused distraction (e.g., Johnstone & Page, 2004). The overall finding that self-efficacy increased following exposure supports Bandura's (1977, 1988) self-efficacy theory that suggests that accomplishing difficult tasks will lead to a sense of mastery. The results of Study 2 also support Bandura's (1977, 1988) proposal that distraction may further aid in increasing self-efficacy due to reduced physiological arousal associated with distraction use. Specifically, in Study 2 the use of moderate levels of distraction led to the greatest increases in self-efficacy, and this distraction level was likely optimal due to (1) being somewhat distracting, (2) being a casual conversation that may aid in reducing physiological arousal, and (3) not being overly difficult or creating task-induced anxiety (as may have been the case in the high

distraction condition). Overall, the current results provide support for both self-efficacy theory and previous research in this area.

Clinical Implications

Historically, distraction has frequently been discouraged in the context of exposure (e.g., Boschen, Neumann, & Waters, 2009; Clark et al., 2006; Foa & Kozak, 1986). However, others have suggested that distraction use may not be detrimental to treatment outcome (e.g., Bandura, 1977, 1988; Parrish, Radomsky, & Dugas, 2008; Salkovskis, 1991; Salkovskis, Clark, & Gelder, 1996). It has further been stated that the use of such techniques is often encouraged in clinical practice (e.g., Craske, Street, & Barlow, 1989; Salkovskis, 1991). The results of the current research program present important considerations for clinical practice. Firstly, results of Study 2 indicate that distraction need not necessarily be discouraged in the context of exposure, as the use of such strategies did not have a negative impact on exposure outcome. However, given smaller effect sizes for change in the high distraction condition, it is possible that distraction strategies that are highly taxing may be less ideal. More research is necessary in order to clarify the potential impact of highly taxing tasks on exposure outcome, which may be an important consideration when selecting distraction tasks or discussing their use with clients.

Although overall findings suggest that distraction does not impede progress in exposure, it may be important to consider whether or not an individual holds strong maladaptive beliefs about distraction. Analyses related to the impact of BADI scores on exposure outcome revealed that strong maladaptive beliefs about distraction were related to less improvement when a moderate amount of distraction is utilized. Therefore, decisions about whether to allow the use of distraction during exposure may depend in part on whether an individual feels that distraction is a necessary or useful strategy to cope with anxiety. For these individuals, it may be ideal to target this belief directly, and potentially discourage the use of distraction during exposure. Given that targeting a broad range of maladaptive beliefs is an important component of CBT (e.g., Beck, 1976; Clark & Beck, 2010; Shafran, Brosan, & Cooper, 2013), being able to assess distraction-related beliefs using the BADI and understanding more about the impact of these beliefs on treatment outcome is clinically informative.

The results of Study 2 also have important implications for clinical practice, given the observed acceptability-enhancing role of the use of distraction. With high rates of treatment drop-out and refusal (e.g., Bados, Balaguer, & Saldaña, 2007; Foa et al., 2005), it is imperative

that methods to increase acceptability and willingness to complete treatment continue to be investigated. Importantly, findings indicating that treatment outcome may not be impeded by safety behaviour use (e.g., Hood et al., 2010; Milosevic & Radomsky, 2008, 2013b; Rachman et al., 2011) or distraction use (e.g., Antony et al., 2001; Grayson, Foa, & Steketee, 1986; Oliver & Page, 2003, 2008), along with their use being associated with increased treatment acceptability (e.g., Levy & Radomsky, 2014), may provide an avenue by which to increase treatment engagement and client retention. In the context of safety behaviour, it has been specifically suggested that the incorporation of these strategies in early stages of treatment may aid in reducing high rates of treatment drop-out and refusal (Parrish, Radomsky, & Dugas, 2008; Rachman, Radomsky, & Shafran, 2008). The same theory may be relevant to the use of distraction during exposure. Considering the results of Study 2, the use of distraction may not interfere with exposure outcome and enhances perceptions of treatment acceptability and willingness to adhere to and attend treatment. Therefore, it may be useful to allow (and potentially even encourage) the use of distraction early in treatment, especially for individuals who are highly fearful about completing exposure; however, more research needs to be completed (including with clinical samples) before implementing these recommendations in clinical practice.

Future Directions

While the results of this research program are informative, both replication and extension are necessary in order to confirm the current findings and expand upon potential clinical recommendations. There are a number of potential directions that could be taken to replicate and expand on the findings of the current research program. In terms of further development of the BADI presented in Study 1, validation of the revised BADI with a clinical and treatment-seeking sample would provide important information about the properties of this measure in a clinical sample. Additionally, it would be helpful to see whether BADI scores (i.e., maladaptive beliefs about distraction) predict treatment outcome in clinical practice, as well as what impact these beliefs have on exposure when distraction is or is not utilized. While the supplemental chapter in this research program presented data that aimed to begin to address this question, it was limited by the use of the original (i.e., unreduced) version of the BADI, and by a complex design that was assessing a separate research question. A more direct comparison of individuals with high and low maladaptive beliefs about distraction (as assessed by the reduced BADI) with both

distracted and undistracted exposure would aid in clarifying the impact of these beliefs on exposure outcome.

As previously mentioned, the observed relationship between maladaptive beliefs and lesser improvement during exposure was only evident in the moderate distraction condition; it is possible that the conversational task utilized in this condition exhibited strong similarities to typical distraction techniques used by individuals when anxious, and that this may have further contributed to reduced improvement. In other words, using a distraction strategy that parallels that which an individual typically employs may strengthen their belief that distraction is necessary or effective, whereas this may not be the case if a different type of distraction task is utilized. Indeed, a recent study showed that when individuals with contamination-related OCD used novel (or never-before-used) safety aids in an exposure session, (compared to safety aids that they use regularly in their day-to-day lives), improvement over the course of an exposure session was enhanced (Levy & Radomsky, under review). Therefore, while maladaptive beliefs about distraction may be one important area of consideration, the specific type of distraction task utilized, and how this relates to typical use, may also be important. Future studies should consider investigating the impact of using typical versus novel distraction tasks in the context of exposure.

The focus of Study 2 was the impact of differing levels of distraction on exposure outcome. While results indicated no significant differences in exposure outcome between conditions with no, low, moderate, and high distraction, the high distraction condition did not show as much improvement when within group effect sizes were evaluated. Therefore, especially given design-related limitations, further research should aim to clarify the role of differing levels of distraction during exposure. Importantly, researchers should continue to utilize experimentally validated distraction tasks to ensure that different levels of distraction are in fact achieved. Furthermore, the impact of level of distraction on exposure outcome may be more robust in a clinical or treatment-seeking population. Therefore, it is important to test this hypothesis in the context of treatment, or at least with a clinical sample.

Although two possible factors that may inform our understanding of the discrepant literature on distraction use during exposure were considered in the current research program, namely individual differences in maladaptive beliefs about distraction and the cognitive load associated with distraction tasks, there are a number of other potential factors that warrant further

attention. Firstly, other individual differences such as personality characteristics or distress tolerance may be relevant to the impact of distraction on exposure. Moreover, in addition to cognitive load, other distraction task properties may be important, such as personal relevance of the task, the individual's interest in the task, and whether cognitive and/or visual attention are manipulated. It is also possible that diverse outcomes may occur with different types or severity of anxiety. Of course these factors only comprise a small number of potentially important aspects to consider, but it is clear that a number of questions remain unanswered.

Finally, while the current research program focused on the impact of specific distraction-related factors during exposure, it may be informative to investigate the impact of distraction use either prior to entering anxiety-provoking situations (i.e., when experiencing anticipatory anxiety) or following an anxiety-provoking situation when individuals may engage in post-event processing. For example, recent research in the area of social anxiety has suggested that distraction, compared to anticipatory processing, prior to a speech task reduced both self-reported and physiological symptoms of anxiety and also led to improved speech performance (Wong & Moulds, 2011), a finding that has been observed in additional studies (e.g., Hinrichsen & Clark, 2003; Vassilopoulos, 2005). Although these investigations focused on individuals with social anxiety, it may be useful to examine similar hypotheses with other forms of anxiety.

In summary, although a number of studies have investigated distraction use during exposure, mixed findings have made it difficult to fully understand the role of distraction. Numerous factors may help explain these discrepant findings, and two potentially important factors have been described in the current research program. The development of the BADI will allow for future investigations of the impact of maladaptive beliefs about distraction on exposure outcome, which may have important theoretical and clinical implications. Further research will allow for a more in depth understanding of the impact of these beliefs on treatment. Additionally, although the hypothesis that differing levels of cognitive load associated with distraction tasks would lead to differential treatment outcome was largely unsupported in Study 2, further research should continue to evaluate this possibility through the use of a different experimental design and/or different types of distraction. If other investigations elicit differences associated with varying levels of distraction this may be an important consideration in clinical practice. Alternatively, if others similarly find that distraction level does not impact outcome, this would also have important clinical and theoretical implications. Finally, many additional

factors may be important to when, in what way, and for whom distraction use may be beneficial or detrimental, and further studies examining these factors would aid in gaining a more comprehensive understanding of distraction use during exposure.

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Appendix A.

Hierarchy of BAT Steps in Study 2 (Experiment 2)

1. In room with toilet at furthest point away from the toilet (9 feet)
2. Step onto the next closest line on the floor (8 feet away from toilet)
3. Step onto the next closest line on the floor (7 feet away from toilet)
4. Step onto the next closest line on the floor (6 feet away from toilet)
5. Step onto the next closest line on the floor (5 feet away from toilet)
6. Step onto the next closest line on the floor (4 feet away from toilet)
7. Step onto the next closest line on the floor (3 feet away from toilet)
8. Step onto the next closest line on the floor (2 feet away from toilet)
9. Step onto the next closest line on the floor (1 foot away from toilet)
10. Stand next to the toilet
11. (Continue) looking into the toilet bowl
12. Touch the top of the tank of the toilet with 1 finger and leave it there
13. Touch the top of the tank of the toilet with 4 fingers and leave them there
14. Touch the top of the tank with your whole hand (including palm) and leave it there
15. Touch the top of the tank with two hands (including palms) and leave them there
16. Rub your hands together in an intertwining fashion (like washing hands)
17. Crouch down to look closely into the toilet bowl
18. Touch the outside of the toilet bowl with 1 finger and leave it there
19. Touch the outside of the toilet bowl with 4 fingers and leave them there
20. Touch the outside of the toilet bowl with your whole hand (including palm) and leave it there
21. Touch the outside of the toilet bowl with two hands (including palms) and leave them there
22. Rub your hands together in an intertwining fashion (like washing hands)
23. Touch the toilet seat with 1 finger and leave it there
24. Touch the toilet seat with 4 fingers and leave them there
25. Touch the toilet seat with your whole hand (including palm) and leave it there
26. Touch the toilet seat with two hands (including palm) and leave them there
27. Rub your hands together in an intertwining fashion (like washing hands)

Lift the toilet seat up

28. Touch the underside of the toilet seat with 1 finger and leave it there
29. Touch the underside of the toilet seat with 4 fingers and leave them there
30. Touch the underside of the toilet seat with your whole hand (including palm) and leave it there
31. Touch the underside of the toilet seat with two hands (including palms) and leave them there
32. Rub your hands together in an intertwining fashion (like washing hands)
33. Touch the rim of the toilet bowl with 1 finger and leave it there
34. Touch the rim of the toilet bowl with 4 fingers and leave them there
35. Touch the rim of the toilet bowl with your whole hand (including palm) and leave it there
36. Touch the rim of the toilet bowl with two hands (including palms) and leave them there
37. Rub your hands together in an intertwining fashion (like washing hands)
38. Touch the inside of the toilet bowl with 1 finger and leave it there
39. Touch the inside of the toilet bowl with 4 fingers and leave them there
40. Touch the inside of the toilet bowl with 4 fingers from each hand and leave them there
41. Rub hands together in an intertwining fashion (like washing hands)
42. Rub your hands all over your clothes
43. Rub your hands on face

Appendix B.

43-Item Unrevised Beliefs about Distraction Inventory

Beliefs about Distraction Inventory (BADI)

When people are anxious, they sometimes do certain things to help them cope with their anxiety. The questions below ask you to indicate how much you use distraction techniques when you are anxious. **Distraction includes anything you might do to help you not to think about the situation or object that is making you anxious, such as imagining you are somewhere else, counting in your head, or having a conversation with someone**. Before answering the questions below, please take a moment to reflect on the types of strategies you use to distract yourself when you are anxious. Please check off all the distraction techniques that apply to you in the following list:

—	Think of something relaxing or calming	—	Think about something insignificant like my grocery or to-do list	__	Pray
__	Read something	—	Talk to someone (in person, on the phone, or by text)	—	Use alcohol, drugs, or smoke cigarettes
—	Think about something important to me, like the people I love or my favourite activity	—	Count to myself	—	Play games or listen to music
__	Daydream	—	Imagine that I am somewhere else	__	Do breathing exercises

__ Other (please describe): _____

When responding to the following questions, please consider situations in which you feel anxious, as well as the distraction techniques that you selected above. Please indicate how much you disagree or agree with each statement using the scale below.

1	2	3	4	5	6	7
disagree very much	disagree moderately	disagree a little	neither agree nor disagree	agree a little	agree moderately	agree very much

		1	2	3	4	5	6	7
1)	I rely on distracting myself in order to reduce my anxiety							
2)	If I distract myself, I can do things I would never be able to do otherwise							
3)	Distracting myself is the only way to make it through an anxious situation							
4)	If I were unable to distract myself, I would just leave the anxiety provoking situation I was in							

5)	I often use distraction when I am anxious, but I don't find it helpful							
6)	I never distract myself							
7)	Distracting myself helps me feel more comfortable when I'm anxious, but it isn't really necessary to be able to make it through anxiety-provoking situations							
8)	Distraction is useful for reducing my anxiety							
9)	I always distract myself when I'm feeling anxious							
10)	Without distraction, I wouldn't be able to cope with anxiety							
11)	It never occurs to me to distract myself when I'm anxious							
12)	Even though I find distracting myself useful, I don't feel like I *need* to do this to make it through difficult situations							
13)	I don't know of any better way to reduce my anxiety than using distraction							
14)	If I don't properly distract myself when I'm anxious, I may "lose it" completely							
15)	Distraction is the only way I can get rid of anxiety							
16)	I use distraction even in situations that only make me a little bit anxious							
17)	I can't understand why no matter how hard I try to distract myself it never makes my anxiety go away							
18)	I feel most comfortable if I am able to distract myself when I am nervous							
19)	Using distraction makes anxiety manageable							
20)	I have to distract myself the entire time that I am in an anxiety-provoking situation for it to work							
21)	If I am not able to distract myself when I am anxious, it is no big deal							
22)	Distraction is not effective at all at getting rid of my anxiety							
23)	I wish I could make it through difficult situations without needing to distract myself							
24)	Feeling anxious is unbearable, so I always try to distract myself							
25)	Distracting myself makes it easier for me to stay in anxiety-provoking situations							
26)	I can cope with anxiety without needing distraction							

27)	I use a lot of mental effort to focus on distracting myself when I'm anxious							
28)	I constantly use distraction to feel less anxious							
29)	If I don't distract myself, there is no way I can make it through difficult situations							
30)	The only time I really feel like I need to distract myself is when I am *very* anxious							
31)	I usually make an effort *not* to distract myself when I'm anxious							
32)	My anxiety overwhelms me if I don't distract myself							
33)	Distraction is useful, but if I can't distract myself, I'll still be fine							
34)	If I can't distract myself, I won't be able to handle my anxiety							
35)	I distract myself because I am less anxious if part of my mind is focused on something else							
36)	Distraction helps me cope with my anxiety, but I would still be able to cope just fine without it							
37)	When I know I'm going to be in an anxiety-provoking situation, I always prepare to distract myself							
38)	Distraction helps me manage my anxiety							
39)	I don't feel the need to distract myself when I am anxious							
40)	When I'm anxious, it's helpful (but not necessary) if I can distract myself							
41)	I distract myself every time that I am in an anxiety-provoking situation							
42)	Distracting myself isn't necessary – anxiety is manageable on its own							
43)	When I am anxious, I am able to feel less anxious by distracting myself							

Reverse-scored items: 5, 6, 7, 11, 12, 17, 21, 22, 26, 30, 31, 33, 36, 39, 40, 42

Appendix C.

Final Version of the Beliefs about Distraction Inventory

Beliefs about Distraction Inventory (BADI)

When people are anxious, they sometimes do certain things to help them cope with their anxiety. The questions below ask you to indicate how much you use distraction techniques when you are anxious. **Distraction includes anything you might do to help you not to think about the situation or object that is making you anxious, such as imagining you are somewhere else, counting in your head, or having a conversation with someone**. Before answering the questions below, please take a moment to reflect on the types of strategies you use to distract yourself when you are anxious. Please check off all the distraction techniques that apply to you in the following list:

—	Think of something relaxing or calming	—	Think about something insignificant like my grocery or to-do list	__	Pray
__	Read something	—	Talk to someone (in person, on the phone, or by text)	—	Use alcohol, drugs, or smoke cigarettes
—	Think about something important to me, like the people I love or my favourite activity	—	Count to myself	—	Play games or listen to music
__	Daydream	—	Imagine that I am somewhere else	—	Do breathing exercises

__ Other (please describe): _____

When responding to the following questions, please consider situations in which you feel anxious, as well as the distraction techniques that you selected above. Please indicate how much you disagree or agree with each statement using the scale below.

1	2	3	4	5	6	7
disagree very much	disagree moderately	disagree a little	neither agree nor disagree	agree a little	agree moderately	agree very much

		1	2	3	4	5	6	7
1	I rely on distracting myself in order to reduce my anxiety							
2	Distracting myself is the only way to make it through an anxious situation							
3	Distraction is useful for reducing my anxiety							
4	I always distract myself when I'm feeling anxious							
5	Without distraction, I wouldn't be able to cope with anxiety							

6	I don't know of any better way to reduce my anxiety than using distraction							
7	If I don't properly distract myself when I'm anxious, I may "lose it" completely							
8	Distraction is the only way I can get rid of anxiety							
9	I use distraction even in situations that only make me a little bit anxious							
10	Using distraction makes anxiety manageable							
11	I have to distract myself the entire time that I am in an anxiety-provoking situation for it to work							
12	I wish I could make it through difficult situations without needing to distract myself							
13	Feeling anxious is unbearable, so I always try to distract myself							
14	Distracting myself makes it easier for me to stay in anxiety-provoking situations							
15	I use a lot of mental effort to focus on distracting myself when I'm anxious							
16	I constantly use distraction to feel less anxious							
17	If I don't distract myself, there is no way I can make it through difficult situations							
18	My anxiety overwhelms me if I don't distract myself							
19	If I can't distract myself, I won't be able to handle my anxiety							
20	I distract myself because I am less anxious if part of my mind is focused on something else							
21	When I know I'm going to be in an anxiety-provoking situation, I always prepare to distract myself							
22	Distraction helps me manage my anxiety							
23	I distract myself every time that I am in an anxiety-provoking situation							
24	When I am anxious, I am able to feel less anxious by distracting myself							

Appendix D.

Exposure Instructions

"During the next portion of the study you will be asked to approach the toilet you just saw over a 20 minute period, at your own pace. The reason I will be asking you to do this is because we know that one of the best ways to help people become less fearful is for them to confront their fears even when they feel anxious. What we typically see is that if people stay in the presence of something they fear for a prolonged period of time, their fear actually goes down. This is a well-known and effective component of treatment for contamination fear, and every participant in this study will receive this effective treatment component. The purpose of this study is to try to better understand why and how this component works. Some theories state that it works because it makes you anxious, some say it works because it provides you with new information about the things you fear, and some theories state that it works by just being in the presence of the things you fear. As I mentioned, everyone will receive this effective component of treatment, but we are testing different ways of administering it based on the theories that I just mentioned. Do you have any questions about any of that?"

Appendix E.

Ethics Approval Certificates

Concordia UNIVERSITÉ UNIVERSITY

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: An Examination of Distraction Use in Exposure Therapy for Anxiety

Certification Number: 30000403

Valid From: November 19, 2012 to: November 18, 2013

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 UNIVERSITÉ UNIVERSITY

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: An Examination of Distraction Use in Exposure Therapy for Anxiety

Certification Number: 30000403

Valid From: October 25, 2013 to: October 24, 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
UNIVERSITY

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: An Examination of Distraction Use in Exposure Therapy for Anxiety

Certification Number: 30000403

Valid From: January 27, 2014 to: January 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

Appendix F.

Study Consent Forms

Study 1 Experiment 1 Consent Form

CONSENT FORM

This is to state that I agree to participate in a research project being conducted by Jessica Senn (j_senn@live.concordia.ca; 514-848-2424 ext 5965) and Dr. Adam S. Radomsky (adam.radomsky@concordia.ca; 514-848-2424 ext 2202) in the Psychology Department of Concordia University.

A. PURPOSE
This study aims to examine the use of different types of coping methods used by individuals during stressful situations.

B. PROCEDURES
If I agree to participate in this study, I will be asked to complete a questionnaire package. The package should take approximately 30-45 minutes to complete. 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 the data collected from these questionnaires will be hosted on a Concordia University server, but none of my identifying information will be linked to the questionnaires or hosted on the server. Finally, I will be fully debriefed about the purpose of the study as well as the hypotheses. For my participation, I will receive the opportunity to submit my name in a draw for cash prizes, OR course credit if I am part of the undergraduate participant pool at Concordia University. I am aware that this study employs a standardized protocol for which anxious and depressive symptoms are assessed. I will be provided access to a treatment resource manual containing information about self-help books and local treatment services.

Following my participation, I may be re-contacted in approximately 4 weeks to complete a second set of questionnaires. These questionnaires will also be completed online using the Concordia server. I consent to being re-contacted about these questionnaires.

C. 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 all information obtained will be kept strictly confidential and will be stored under lock and key for a period of seven years after which they 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 contact our lab at (514) 848-

2424, ext. 5965.

Adam S. Radomsky, Ph.D., Associate Professor
Jessica Senn, M.A., Graduate Student

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

If at any time you have questions about your rights as a research participant, please contact Adela Reid, Research Ethics and Compliance Office, Concordia University, at 514-848-2424, ext. 7481 or by e-mail at adela.reid@concordia.ca

Study 2 Experiment 1 Consent Form

CONSENT TO PARTICIPATE IN BALANCING ACT

I understand that I have been asked to participate in a research project being conducted by Jessica Senn of the Department of Psychology, (j_senn@live.concordia.ca; 514-848-2424 x5965) for her doctoral dissertation under the supervision of Dr. Adam S. Radomsky of the Department of Psychology (adam.radomsky@concordia.ca; 514-848-2424 x2202).

A. PURPOSE

I have been informed that the purpose of this study is to test some tasks that will be used for future studies in our laboratory, and also examine how experiencing anxiety influences these tasks.

B. PROCEDURES

I understand that I am being asked to participate in this study and will first be asked to complete a computer-based task. I understand that I will then be asked to repeat this computer task while also completing a second task. I will then be asked to answer some questions about the tasks I completed and fill out some questionnaires on the computer. I understand that these questionnaires ask no questions regarding my name and they will not be connected in any way with my identifying information. I understand that I will next be asked to complete another task while in the presence of a potentially anxiety-provoking stimulus, and will be asked to complete some additional questionnaires. Finally, I understand that the hypotheses of the study will be fully explained and any questions I have will be addressed. I understand that the study should take approximately 60 minutes to complete, and will be audiotaped. For my participation, I understand that I will receive course credit through the Psychology Department Participant Pool, OR be entered in a draw for a chance to win a cash prize ranging from $50 to $300.

C. RISKS AND BENEFITS

I understand that a potential risk of this study is that I may be asked to respond to questions of a sensitive nature (i.e., asking about symptoms of depression and anxiety), and that I may experience anxiety during the study. In the event of the unlikely occurrence of worsening of fear following the study, the researcher will offer treatment resources with no pressure or judgement.

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 (i.e., the researcher will know, but not disclose my identity). I understand that all information obtained will be kept strictly confidential and will be stored under lock and key for a period of seven years after which they will be shredded or destroyed. 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 I have any questions concerning the study, I understand that I can ask the experimenter now. If other questions or concerns come up following the study, I understand that I am encouraged to contact the Anxiety and Obsessive-Compulsive Disorders laboratory at (514) 848-2424, ext. 2199.

Adam S. Radomsky, Ph.D., Associate Professor
Jessica M. Senn, M.A., Doctoral Student

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

NAME (please print) _____ AGE _____

SIGNATURE _____ SEX M / F

WITNESS SIGNATURE _____

I FURTHERMORE CONSENT AND VOLUNTARILY AGREE TO HAVE THIS STUDY *AUDIOTAPED* FOR THE PURPOSE OF ENSURING STUDY INTEGRITY.

NAME (please print) _____

SIGNATURE _____

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.x 7481 or ethics@alcor.concordia.ca.

Study 2 Experiment 1 Debriefing/Deception Consent Form

CONSENT FORM TO PARTICIPATE IN RESEARCH

As I have just been informed, the use of deceptive information was essential in this study in order to mimic a true anxiety-provoking stimulus. Thus, we used a toilet that was made to look as though it is contaminated even though it in fact is not.

By signing below I indicate that I have been informed of this minor deception and allow the Anxiety and Obsessive Compulsive Disorders Laboratory to include my results in their analyses. Given the nature of this deception, I agree to refrain from talking about the specific details of this study with my friends and/or classmates.

Signature _____

Witness _____

Date _____

If I have any questions concerning this study, I will be sure to ask the researcher or call the lab at 514-848-2424, ext. 5965.

Adam Radomsky, Ph.D., Associate Professor.
Jessica Senn, M.A., Doctoral Student

Study 2 Experiment 2 Consent Form – Undergraduate Participants

CONSENT TO PARTICIPATE IN 'LOOK OVER THERE!'

I understand that I have been asked to participate in a research project being conducted by Jessica Senn of the Department of Psychology, (j_senn@live.concordia.ca; 514-848-2424 x5965) for her doctoral dissertation under the supervision of Dr. Adam S. Radomsky of the Department of Psychology (adam.radomsky@concordia.ca; 514-848-2424 x2202).

A. PURPOSE

I have been informed that the purpose of this study is to test a component of treatment for contamination fear (i.e., an intense fear of objects or situations that are perceived as dirty or disgusting, or capable of causing illness).

B. PROCEDURES

I understand that I am being asked to participate in this study, and will be asked to attend two separate appointments in the lab. I understand that the first appointment will begin with a short assessment with the experimenter followed by some questionnaires. Next I will be asked to approach a contaminant as closely as I am able and provide ratings of my anxiety level. I understand that I will then spend approximately 15 minutes in the room with the contaminant and experimenter while following some specific instructions. This portion of the experiment will be audiotaped. Finally, I understand that I will be asked to complete some more questionnaires including those about my reactions to the previous task. I understand that the first visit should take approximately 2 hours, and I will receive 2 participant pool credits for participating. The second visit will take place one week after the first visit, and will involve completing more questionnaires and approaching a contaminant as closely as possible once again. I will also be asked to complete a short cognitive task. I understand that the second visit should take approximately 45-60 minutes, and that I will receive one additional participant pool credit for this visit. I understand that the questionnaires in this study ask no questions regarding my name and they will not be connected in any way with my identifying information. At the end of the second visit, the hypotheses of the study will be fully explained and any questions I have will be addressed. For my participation, I understand that I will receive course credit through the Psychology Department Participant Pool for each of the visits, OR be entered in a draw for a chance to win a cash prize ranging from $50 to $300.

C. RISKS AND BENEFITS

I understand that the potential risk of participation in this study is that I might become anxious or feel as though my fear is worse than it was when I arrived. In the event of the unlikely occurrence of worsening of fear, the researcher will offer treatment resources with no pressure or judgement. I understand that benefits of participation will be to receive a short treatment component related to my fear.

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 (i.e., the researcher will know, but not disclose my identity). I understand that all information obtained will be kept strictly confidential and will be stored under lock and key for a period of seven years after which they will be shredded or destroyed. 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 I have any questions concerning the study, I understand that I can ask the experimenter now. If other questions or concerns come up following the study, I understand that I am encouraged to contact the Anxiety and Obsessive-Compulsive Disorders laboratory at (514) 848-2424, ext. 2199.

Adam S. Radomsky, Ph.D., Associate Professor
Jessica M. Senn, M.A., Doctoral Student

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

NAME (please print) _____ AGE _____

SIGNATURE _____ SEX M / F

WITNESS SIGNATURE _____

I FURTHERMORE CONSENT AND VOLUNTARILY AGREE TO HAVE THIS STUDY *AUDIOTAPED* FOR THE PURPOSE OF ENSURING STUDY INTEGRITY.

NAME (please print) _____

SIGNATURE _____

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.x 7481 or ethics@alcor.concordia.ca.

Study 2 Experiment 2 Consent Form – Paid Participants

CONSENT TO PARTICIPATE IN 'LOOK OVER THERE!'

I understand that I have been asked to participate in a research project being conducted by Jessica Senn of the Department of Psychology, (j_senn@live.concordia.ca; 514-848-2424 x5965) for her doctoral dissertation under the supervision of Dr. Adam S. Radomsky of the Department of Psychology (adam.radomsky@concordia.ca; 514-848-2424 x2202).

A. PURPOSE

I have been informed that the purpose of this study is to test a component of treatment for contamination fear (i.e., an intense fear of objects or situations that are perceived as dirty or disgusting, or capable of causing illness).

B. PROCEDURES

I understand that I am being asked to participate in this study, which will consist of one or two separate appointments in the lab. I understand that at the first visit I will find out whether or not I am eligible to continue to the study and attend the second visit. I understand that the first appointment will begin with a short assessment with the experimenter followed by some questionnaires. Next I will be asked to approach a contaminant as closely as I am able and provide ratings of my anxiety level. I understand that I will then spend approximately 20 minutes in the room with the contaminant and experimenter while following some specific instructions. This portion of the experiment will be audiotaped. Finally, I understand that I will be asked to complete some more questionnaires including those about my reactions to the previous task. I understand that the first visit should take approximately one hour and 45 minutes (or approximately one hour if I am not eligible to continue). The second visit will take place one week after the first visit, and will involve completing more questionnaires and approaching a contaminant as closely as possible once again. I will also be asked to complete a short cognitive task. I understand that the second visit should take approximately 45-60 minutes. I understand that the questionnaires in this study ask no questions regarding my name and they will not be connected in any way with my identifying information. At the end of the second visit, the hypotheses of the study will be fully explained and any questions I have will be addressed.

If I am eligible to continue the study, I will be paid $30 at the end of my second visit. If I am not eligible to continue, I will receive $10 for attending the first visit, and my second visit will be cancelled.

C. RISKS AND BENEFITS

I understand that the potential risk of participation in this study is that I might become anxious or feel as though my fear is worse than it was when I arrived. In the event of the unlikely occurrence of worsening of fear, the researcher will offer treatment resources with no pressure or judgement. I understand that benefits of participation will be to receive a short treatment component related to my fear.

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 (i.e., the researcher will know, but not disclose my identity). I understand that all information

obtained will be kept strictly confidential and will be stored under lock and key for a period of seven years after which they will be shredded or destroyed. 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 I have any questions concerning the study, I understand that I can ask the experimenter now. If other questions or concerns come up following the study, I understand that I am encouraged to contact the Anxiety and Obsessive-Compulsive Disorders laboratory at (514) 848-2424, ext. 2199.

Adam S. Radomsky, Ph.D., Professor
Jessica M. Senn, M.A., Doctoral Student

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

NAME (please print) _____ AGE _____

SIGNATURE _____ SEX M / F

WITNESS SIGNATURE _____

I FURTHERMORE CONSENT AND VOLUNTARILY AGREE TO HAVE THIS STUDY *AUDIOTAPED* FOR THE PURPOSE OF ENSURING STUDY INTEGRITY.

SIGNATURE _____

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.x 7481 or ethics@alcor.concordia.ca.

Study 2 Experiment 2 Debriefing/Deception Consent Form

CONSENT FORM TO PARTICIPATE IN RESEARCH

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By signing below I indicate that I have been informed of this minor deception and allow the Anxiety and Obsessive Compulsive Disorders Laboratory to include my results in their analyses. Given the nature of this deception, I agree to refrain from talking about the specific details of this study with my friends and/or classmates.

Signature _____

Witness _____

Date _____

If you have any questions concerning this study, please feel free to ask the researcher or call the lab at 514-848-2424, ext. 5965.

Adam Radomsky, Ph.D., Associate Professor.
Jessica Senn, M.A., Doctoral Student