The Roles of Safety Behaviour in the Cognitive-Behavioural Treatment of Anxiety Disorders

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ABSTRACT

The Roles of Safety Behaviour in the Cognitive-Behavioural Treatment of Anxiety Disorders

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Safety behaviour, which includes idiosyncratic strategies aimed at reducing anxiety and avoiding or averting perceived catastrophe, has been conceptualized in cognitive-behavioural models of anxiety disorders as having an anti-therapeutic, anxiety-maintaining function. There is substantial empirical support for its proposed negative effects in the context of exposure-based treatments for anxiety disorders. However, other hypotheses and findings suggest that incorporation of safety behaviour into such treatments might instead facilitate gains and/or enhance treatment acceptability. This research aimed to further understand the role of safety behaviour in the treatment of anxiety disorders. In Study 1, an experimental paradigm was used to examine the effect of 'safety gear' on belief change. Spider fearful participants were asked to evaluate the validity of a targeted negative belief about spiders during a brief session with a live tarantula while either using or not using protective gear during the session. The results demonstrated that negative beliefs declined equally and robustly in both groups after the session. Study 2 investigated treatment acceptability and preference as a function of safety behaviour use (judicious vs. discouraged) and treatment rationale (cognitive vs. extinction). Clinically anxious participants and undergraduate students provided acceptability ratings and preference ranks for four written vignettes describing a course of CBT for fear or anxiety. Treatment descriptions promoting judicious safety behaviour use received significantly higher acceptability ratings than those discouraging its use.

Descriptions that presented a cognitive versus an extinction rationale were also rated as more acceptable. The most highly ranked treatment included judicious safety behaviour use under a cognitive rationale. The same pattern of results was observed in both participant groups. Study 3 involved the development and psychometric evaluation of a novel self-report measure of safety behaviour, the Safety Behaviour Inventory (SBI), using a large undergraduate student sample and a smaller sample of clinically anxious participants. Exploratory and confirmatory factor analyses and analyses of reliability and validity were conducted. Preliminary support was obtained for the discriminant and construct validity of a four-factor SBI. The combined results of these studies are discussed in terms of cognitive-behavioural theories and treatments of anxiety disorders, and future research directions are suggested.

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I would like to extend my most heartfelt gratitude to my research supervisor, Dr. Adam Radomsky, whose exceptional mentorship during the past seven years has served as the foundation for all of my accomplishments as a graduate student. I have benefited so greatly from his expertise, guidance, patience, and good humour, and I know that his wisdom will continue to guide me through future endeavours.

I am also grateful to the many individuals with whom I have worked in the Fear and Anxiety Disorders Laboratory. Without their assistance and support, the completion of my research would not have been possible. Thank you to Stefanie Lavoie, Amanda Levine, Sarah Zullo, Jeff Renaud, Amanda Ruthman, and Ivana DiLeo. I would further like to extend my sincerest thanks to Laurie Gelfand, who has been a wonderful friend and confidante during my time in the lab and beyond.

I would like to acknowledge the contributions of Drs. Michel Dugas and Mark Ellenbogen, whose thoughtful and constructive feedback about my proposed program of research has helped to clarify my research questions and methods.

Finally, my deepest gratitude is reserved for my partner, Brett Bergmann, whose persistent and immeasurable support since the first day of this long journey has been vital in bringing me to its end.

DEDICATION

This thesis is dedicated in loving memory to my grandfather, Josip (Mišo) Križanović.

CONTRIBUTIONS OF AUTHORS

The following thesis is comprised of three manuscripts:

Study 1 (Chapter 2)

Milosevic, I., & Radomsky, A. S. (2011). *Safety behaviour does not prevent cognitive change during a behavioural experiment*. Manuscript submitted for publication.

Study 2 (Chapter 4)

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Study 3 (Chapter 6)

Milosevic, I., & Radomsky, A. S. (2011). *The Safety Behaviour Inventory: Development and psychometric evaluation.* Manuscript in preparation for publication.

I was responsible for selecting the overall focus of this program of research. Specific topics for each study were chosen in consultation with my research supervisor, Dr. Adam Radomsky. I was principally responsible for implementing all aspects of the research, including study design, participant recruitment, data collection, statistical analysis, interpretation of findings, and preparation of manuscripts, as well as animal care and training of students and volunteers who were involved in some of this work (see below). Dr. Radomsky provided ongoing supervision, consultation, and feedback during all stages of the research process. My dissertation committee members, Drs. Michel Dugas and Mark Ellenbogen, provided feedback and approval of the research methods during a proposal meeting.

For Study 1, I was assisted by undergraduate thesis students (Amanda Levine, Sarah Zullo, Jeff Renaud) and a student volunteer (Amanda Ruthman) in data collection. Their role was to guide each participant through a behavioural approach test at two points during the protocol and to take several measurements during this process. My role in terms of data collection was to administer the broader protocol and to collect most of the data from each participant. These students also contributed to recruitment, particularly classroom-based recruitment and the scheduling of test sessions via telephone or email. They additionally had a significant role in data entry, and they contributed to the care of the spider. Meghan Cody, a psychology graduate student at the University of Virginia, provided consultation regarding spider care in the early stages of the study.

For Study 2, I developed the treatment vignettes and selected the self-report measures to be administered to participants. These materials were coded into online forms by Stefanie Lavoie, the senior research assistant in the Fear and Anxiety Disorders Laboratory. Stefanie was additionally responsible for retrieving participant data from the online forms and formatting it in a research database that I used for my statistical analyses. The clinical participants in this study were recruited through a broad lab effort for possible participation in a number of studies. Stefanie was responsible for placing classified ads in local newspapers. Individuals involved in telephone screening and in the administration of clinical interviews (including review of audio recordings of interviews for reliability analysis) included myself and another graduate student in the lab (Laurie Gelfand), as well as a research assistant (Ivana DiLeo). We each were responsible for approximately 30% of the recruitment and interviewing process.

For Study 3, I solicited feedback from members of the Fear and Anxiety Disorders Laboratory during a lab meeting regarding item selection for the Safety Behaviour Inventory. Stefanie Lavoie had the same role in this study as in Study 2 in terms of developing online forms and retrieving data from them.

For all three studies, my role in manuscript preparation involved independently writing complete drafts and making subsequent revisions based on Dr. Radomsky's feedback. The manuscripts for Studies 1 and 2 have received a blind peer review following submission to a journal, and feedback from the reviewers was incorporated into the versions included in this thesis.

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CHAPTER 1

General Introduction

The often observed use of safety behaviour by anxious individuals has attracted both theoretical and empirical consideration in the context of cognitive-behavioural treatments for anxiety disorders (Helbig-Lang & Petermann, 2010; Parrish, Radomsky, & Dugas, 2008; Rachman, Radomsky, & Shafran, 2008; Thwaites & Freeston, 2005). This type of behaviour embodies an extensive range of idiosyncratic strategies aimed at preventing the occurrence of feared outcomes (Salkovskis, 1991; Salkovskis, Clark, & Gelder, 1996). It consists of overt actions, thoughts (covert safety behaviour), and/or the use of comforting or protective objects. Whereas the use of such strategies might provide immediate relief from anxiety, it is believed to be a significant contributor to its maintenance in the longer term.

Safety behaviour has been most extensively investigated in the context of anxious psychopathology, where it is understood as a transdiagnostic phenomenon that plays an important role in each of the anxiety disorders (Parrish et al., 2008). It has also been documented in other disorders, such as depression (Moulds, Kandris, Williams, & Lang, 2008) and sleep disorders (Harvey, 2002). Across all of these pathologies, safety behaviour is understood through the lens of a cognitive-behavioural framework within which it was initially conceptualized (Salkovskis, 1991; see below for elaboration on the framework).

Notably, the use of safety behaviour extends beyond psychopathology. Indeed, it is ubiquitous in daily life. For instance, people commonly keep emergency kits in their vehicles, rehearse presentations prior to speaking in front of groups, use hand sanitizer in

public settings, and carry cell phones, in part, to be readily able to access help should they need it. In some cases, safety behaviour is encouraged at an institutional level. For example, *safety culture,* which refers to the organizational management of safety, has been extensively investigated in order to improve workplace safety in a broad range of settings (Cooper, 2000; Glendon & Stanton, 2000). Features of a well-functioning safety culture include frequent monitoring of risk and vigilance to factors that reduce the likelihood of catastrophe. By contrast to these examples, which illustrate that many safety behaviours used in everyday life have an adaptive function, the use of safety behaviour in anxiety and other disorders is thought to be maladaptive.

Salkovskis (1991) proposed that safety behaviour maintains pathological anxiety by interfering with corrective learning experiences. For instance, socially anxious individuals who rehearse conversations prior to having them will not have the opportunity to learn that even without such preparation they are unlikely to be negatively evaluated by others and/or that they may well be able to cope with negative feedback should they receive it. This model thus stresses that safety behaviour prevents anxious individuals from obtaining disconfirmatory evidence related to their negative threat beliefs. Indeed, they might conclude that their own actions (i.e., the safety behaviour) are responsible for preventing catastrophe from occurring, with the likely result that they will reinterpret harmless, possibly fear-disconfirming experiences as threatening.

In support of the hypothesis that safety behaviour is linked to anticipated negative outcomes, Salkovskis, Clark, and Gelder (1996) found that panic disorder patients' choice of specific safety behaviours was meaningfully related to their catastrophic cognitions (e.g., fainting was associated with holding onto objects and people; having a

stroke was associated with focusing attention to the body). More generally, compared to participants with low anxiety, highly anxious participants have been found to use safety behaviour across a wider variety of situations and in greater number and frequency (McManus, Sacadura, & Clark, 2008). In the case where no differences were observed in the number of safety strategies used by nonanxious and anxious participants, these strategies contributed more strongly to anxiety and negative beliefs in the latter group (Okajima, Kanai, Chen, & Sakano, 2010).

Given its proposed role in the maintenance of maladaptive beliefs, safety behaviour is widely considered to be anti-therapeutic in the context of exposure-based treatments. Accordingly, treatment protocols typically include emphasis on its elimination (e.g., Antony & Swinson, 2000). A number of studies have shown that anxious participants' use of safety behaviour during exposure therapy detracts from its outcomes (e.g., Kim, 2005; Salkovskis et al., 1999; Sloan & Telch, 2002). Findings generally demonstrate less fear reduction and cognitive change in treatment conditions of permitted safety behaviour compared to conditions in which it is discouraged. For example, Sloan and Telch (2002) found that during exposure therapy for claustrophobia, participants who used safety behaviour (e.g., standing near an exit while inside a claustrophobia chamber) reported significantly more fear at post-treatment and follow-up compared to those who instead focused on and reappraised their perceived threat. Others have reported that merely the availability of safety aids, and not necessarily their use, exerts a negative effect on fear reduction (Powers, Smits, & Telch, 2004).

Notably, in these studies, participants who were permitted use of safety behaviour during treatment nevertheless experienced significant post-treatment improvements,

although to a lesser extent than those who were instructed to not use it (Kim, 2005; Powers et al., 2004). As stressed by Rachman et al. (2008), "reductions in fear that were produced even when using safety behaviour should not be overlooked" (p. 165), as they suggest that safety behaviour can facilitate treatment gains. In addition, some studies have reported that participants assigned to conditions requiring elimination of safety behaviour did not comply with instructions to drop it (e.g., McManus et al, 2008; Morgan & Raffle, 1999). It thus appears that exclusion of safety behaviour from treatment might be associated with lower compliance and/or greater distress.

In an effort to demonstrate that improvements in exposure therapy can be facilitated by the judicious use of safety behaviour, earlier work by Bandura, Jeffrey, and Wright (1974) examined the impact of participants' use of *response induction aids* during treatment. Snake phobics were offered minimal, moderate, or high use of such aids (e.g., gloves) when they were unable to perform an exposure exercise after it was modeled to them. Once the desired behaviour was achieved, the protective supports were withdrawn. The results demonstrated substantially greater fear reduction for participants who relied on moderate or high levels of induction aids than for those who were minimally aided. Although treatment outcome was assessed only in terms of change in self-reported fear and approach behaviour, Bandura et al. (1974) stressed that the eventual fading of induction aids ensured that participants would not misattribute their success to the aids but rather to their own sense of mastery over the situation. Indeed, more recent work has shown that the use of protective safety gear during a brief exposure session for snake fear did not impair adaptive cognitive change; comparable post-treatment improvements in

fear and catastrophic cognitions were observed in groups that used and did not use the gear (Milosevic & Radomsky, 2008).

In further support of the judicious use of safety behaviour during exposure-based treatments, it has been demonstrated that escape-based safety behaviour is not necessarily detrimental to treatment outcome. In a replication of an earlier study with comparable results (de Silva & Rachman, 1984), Rachman, Craske, Tallman, and Solymon (1986) compared two 8-session exposure treatments for agoraphobia that varied as a factor of escape behaviour. One group of participants was exposed progressively to fear-evoking situations in a standard manner, whereas participants in the escape-exposure group were exposed progressively but were also instructed to escape if/when their fear reached a pre-set level; they returned to the exposure once their fear dropped below a specified point. Participants in both groups achieved equal and significant improvements on all measures of agoraphobia, which were still evident at a 3-month follow-up. Moreover, the use of escape safety behaviour was not followed by increases in fear or in estimates of danger; instead, it led to a greater sense of control and to less fear during treatment.

Related theory and research additionally suggest that it is possible in some circumstances for safety behaviour to promote cognitive change. Rachman (1983) developed a paradigm for exposure treatment that incorporates safety signals, conditions that indicate a feared outcome will not occur. Safety-signal theory posits that the pairing of safety cues with feared stimuli could be used as incentive during exposure exercises to increase motivation and, ultimately, to facilitate long-term declines in fear and avoidance. This principle has been applied to the conceptualization and treatment of agoraphobia (Rachman, 1983, 1984; Sartory, Master, & Rachman, 1989) and generalized anxiety

disorder (Woody & Rachman, 1994). For example, Sartory and colleagues (1989) compared the effectiveness of four sessions of safety-signal therapy versus four sessions of conventional therapist-assisted exposure for agoraphobia. Participants receiving the safety-signal treatment independently approached a feared target and were met by the therapist at a point at which they had previously left the situation. Those receiving conventional exposure were accompanied by the therapist throughout treatment sessions. Although improvements were observed on most outcome measures for both groups, the safety-signal therapy yielded a small but significant advantage over therapist-assisted exposure, with participants in the former group being more likely to enter previously avoided situations and reporting fewer panic symptoms post-treatment. Other studies have since demonstrated that the use of safety signals in exposure-based paradigms results in less subjective anxiety and physiological arousal, as well as fewer catastrophic cognitions (Carter, Hollon, Carson, & Shelton, 1995; Schmidt & Telch, 1994).

More recent developments in the safety behaviour literature lend support to earlier findings that safety behaviour does not necessarily hinder progress in exposure-based treatments. Comparable gains have been observed in safety behaviour and exposure only conditions for brief treatment of snake fear (Milosevic & Radomsky, 2008), spider fear (Hood, Antony, Koerner, & Monson, 2010), and claustrophobic fear (Deacon, Sy, Lickel, & Nelson, 2010; Sy, Dixon, Lickel, Nelson, & Deacon, 2011). While there has been discussion about the possibility that the facilitative effects of safety behaviour are unique to phobic fear (Hood et al., 2010), similar findings have also recently been reported for contamination fear (Rachman, Shafran, Radomsky, & Zysk, 2011; Sy et al., 2011; van den Hout, Engelhard, Toffolo, & van Uijen, 2011). They suggest that it might be possible

for safety behaviour to be used without detriment in treatments for other more complex anxiety disorders, such as obsessive-compulsive disorder.

The use of safety behaviour by anxious individuals clearly has important implications for exposure-based treatments. Divergent perspectives in this domain emphasize the need for a greater understanding of the function of the behaviour in different contexts. In accordance with this goal, Thwaites and Freeston (2005) presented an important discussion on the distinction between safety behaviour and adaptive coping strategies. The authors note that coping strategies are used to reduce anxiety, but, unlike safety behaviour, they are not aimed at avoiding catastrophe and thus do not maintain or worsen one's fear response. This theoretical distinction, however, is often not easily applicable to clinical settings, where the line distinguishing safety behaviour and coping strategies can be drawn only after evaluating a patient's intention for their use, their perceived function to that individual in a specific context, and the resultant impact on his/her cognitions.

In a call for a reconsideration of the definition of safety behaviour and its role in cognitive-behavioural treatments, Rachman and colleagues (2008) detailed a comprehensive rationale for incorporating safety behaviour into treatment. They proposed that it would have a facilitative effect when used "in a limited manner and only for a limited period, especially in the early stages of treatment" and "if an obstacle is encountered later in the course of treatment" (i.e., judicious use; pg. 171). They also presented possible advantages of this method, including increased treatment acceptability and reductions in the number of refusers and drop-outs, enhancement of patients' sense of control, increased cooperation with treatment, more effective pacing of treatment, ease of

extending duration of exposures, and facilitated acquisition of corrective information. The authors stressed that judicious use of safety behaviour does not preclude disconfirmatory experiences and fear reduction

Rachman et al. (2008) called for future investigations to "elucidate the *benefits* as well as the disadvantages of the practical application of safety behaviour to cognitive–behaviour therapy" (pg. 171). Similarly, Parrish et al. (2008) suggested that there is a need for greater understanding of the mechanisms through which safety behaviour exerts its effects, as well as the circumstances under which it is disruptive versus facilitative. Accordingly, this research program aimed to contribute to the existing safety behaviour literature through three novel investigations designed to address gaps in current knowledge. These included (i) an experimental study of the effect of protective safety gear on changes in spider fearful participants' threat beliefs, which they tested during a brief session with a live spider, (ii) a vignette-based study examining nonclinical and clinically anxious participants' perceptions of the acceptability of exposure-based treatments that varied as function of safety behaviour use (judicious vs. discouraged) and treatment rationale (cognitive vs. extinction), and (iii) a study on the development and psychometric evaluation of a novel self-report measure of safety behaviour, which was conducted with samples of nonclinical and clinically anxious participants. The overall purpose of this work was to increase current understanding of the factors that contribute to the adaptive and maladaptive effects of safety behaviour, which will help to inform its judicious use for therapeutic gain.

CHAPTER 2

Safety Behaviour Does Not Prevent Cognitive Change during a Behavioural Experiment

According to cognitive-behavioural models of anxiety disorders, safety behaviour plays a key role in the maintenance of pathological anxiety (Clark, 1999; Clark & Wells, 1995; Salkovskis, 1991). This highly idiosyncratic behaviour consists of overt (e.g., avoidance, safety aids) and/or covert (e.g., mental distraction) strategies aimed at reducing distress or preventing the occurrence of feared outcomes in threatening situations (Salkovskis et al., 1996). The proposed anxiety-maintaining function of safety behaviour has been attributed to its interference with adaptive cognitive change (Salkovskis, 1991). To illustrate, a socially anxious individual who rehearses conversations before speaking with her co-workers lest she might otherwise 'run out of things to say' will not have the opportunity to test the validity of this prediction and to learn that she is probably capable of spontaneously generating conversation material. She instead might infer that her rehearsal of conversations is the reason that she is able to avert her feared catastrophe. Thus, the proposed critical mechanism for the maintenance of threat beliefs is the impaired acquisition of disconfirmatory information resulting from the misattribution of safety to one's use of safety behaviour (Salkovskis, 1991). It has also been hypothesized that safety behaviour interferes with threat reappraisal by diverting attention away from disconfirmatory information (Powers et al., 2004; Sloan & Telch, 2002).

McManus and colleagues (2008) found that participants high in social anxiety used more safety strategies, with greater frequency, and across a broader range of

situations than less socially anxious participants. Okajima et al. (2010) did not observe a difference in the number of safety behaviours used by socially anxious and healthy participants, but, importantly, they found that safety behaviour contributed more strongly to anxiety and negative beliefs among participants with social anxiety. The authors suggested that for these individuals, safety behaviour is linked to the anticipation of negative consequences. This hypothesis is supported by Salkovskis et al.'s (1996) findings that panic disorder patients' choice of specific safety strategies was meaningfully related to their catastrophic cognitions. Okajima et al. also noted that the comparable number of safety strategies used by anxious and healthy participants suggests that some safety behaviour used by anxious individuals might function as adaptive coping behaviour. As discussed by Thwaites and Freeston (2005), the distinction between helpful coping strategies and safety behaviour presents a clinical challenge and mandates an analysis of the perceived function of given strategies in a specific context and of their impact on cognitions.

The current mandate of cognitive-behavioural treatments to reduce and eventually eliminate patients' use of safety behaviour has considerable empirical support. Studies comparing cognitive change under conditions of safety behaviour utilization versus elimination have generally shown significant post-exposure improvements in both cases, but conditions discouraging safety behaviour use have benefited from changes of greater magnitude (e.g., Kim, 2005; Morgan & Raffle, 1999; Powers et al., 2004; Sloan & Telch, 2002; Wells et al., 1995). Importantly, some of this work has been limited by the presentation of differing treatment rationales to the experimental groups, whereby a cognitive rationale was paired with instructions to drop safety behaviour and a

habituation rationale was paired with the maintenance of safety behaviour (e.g., Salkovskis, Clark, Hackmann, Wells, & Gelder, 1999; Wells et al., 1995). It is feasible, as Salkovskis et al. (1999) suggested, that "the specifically cognitive rationale made it possible for the patients to take advantage of the experience of disconfirmation" (p.572).

In an effort to overcome the limitations of earlier studies, Sloan and Telch (2002) provided the same treatment rationale for all conditions in their investigation of safety behaviour use by students with high claustrophobic fear. Nevertheless, by contrast to those in a comparison group, participants who were offered the use of safety strategies did not receive instructions for guided threat focus and reappraisal. Significant reductions in threat expectancies across six treatment trials were observed in safety behaviour utilization, guided threat reappraisal (GTR), and control groups; however, these reductions were greatest in the GTR group. The authors concluded that GTR played a role in facilitating the disconfirmation of participants' faulty threat perceptions. It is not possible to know from their design whether the pairing of safety behaviour utilization with GTR would have yielded similar facilitative effects.

In subsequent work in this area, Powers and colleagues (2004) randomized participants with high claustrophobic fear to one of five conditions (exposure only, exposure with safety behaviour utilization, exposure with safety behaviour availability, credible placebo treatment, and wait list). All exposure-based interventions included an identical extinction rationale, whereby participants were informed that "one effective strategy for reducing their fear is to be exposed to the feared situation repeatedly until the anxiety decreases" (p. 450). Most participants in the exposure only condition (94%) achieved high end-state functioning post-treatment, whereas post-treatment reductions in

fear were half as large for participants in the safety behaviour availability and utilization groups. Changes in catastrophic cognitions were not explicitly measured, although it follows from the results that they might be of similar magnitude as was fear reduction. Powers et al. (2004) emphasized the possible deleterious effect of not only safety behaviour utilization during exposure but also its mere availability.

There is emerging evidence, however, that in some instances, safety behaviour utilization does not hinder therapeutic change in catastrophic cognitions (e.g., Deacon et al., 2010; Hood et al., 2010; Milosevic & Radomsky, 2008; Rachman et al., 2011; Sy et al., 2011; van den Hout et al., 2011; for reviews, see Parrish et al., 2008, and Rachman et al., 2008). In their review of the current safety behaviour literature, Rachman and colleagues (2008) proposed that the *judicious* use of safety behaviour, which involves offering safety strategies in the earlier stages of exposure and fading them as treatment progresses, has the potential to facilitate fear reduction and change in maladaptive beliefs. They outlined a number of potential advantages of judiciously incorporating safety behaviour into exposure-based treatments, one of them being that a sense of safety might enable patients to more readily "absorb corrective information about the threat" (p. 170).

Although their outcome measures primarily included indices of fear and avoidance rather than maladaptive beliefs, several earlier lines of research have yielded findings that generally lend support for the judicious use of safety behaviour proposed by Rachman et al. (2008). Bandura and colleagues' (1974) investigation into the effects of *response induction aids* during exposure treatment for snake phobia demonstrated substantially greater fear reduction for participants who relied on moderate or high levels of induction aids (e.g., gloves) than for those who were minimally aided. Bandura et al.

stressed that the eventual fading of the aids ensured that participants would not misattribute their success to them but rather to their own sense of mastery over the situation. In earlier work by de Silva and Rachman (1984) and Rachman et al. (1986), agoraphobic participants were exposed progressively to feared situations and instructed to escape if/when their fear reached a pre-set level; they returned to the situation once their fear dropped below a specified point. Those who received this treatment experienced significant improvements, comparable to those of a standard exposure group, on measures of agoraphobia. These gains were still evident at a 3-month follow-up.

Recent work by Deacon et al. (2010) tested the effects of judicious use of safety behaviour in a single-session intervention for claustrophobic fear. Participants in exposure only and exposure plus safety behaviour conditions received identical rationales emphasizing the deleterious effects of avoidance and inaccurate threat beliefs in the maintenance of claustrophobic fear, as well as the efficacy of exposure in reducing this fear. They were asked to "push themselves to face their fears as much as possible" (p. 74). Results indicated that after a series of exposure trials lasting up to a total of 30 minutes, both groups demonstrated clinically significant change in peak fear ratings at post-treatment and follow-up assessments. Furthermore, the use of safety behaviour did not preclude cognitive change, as both groups experienced significant and comparable improvements in claustrophobia-related cognitions. Deacon et al. emphasized that their withdrawal of safety aids during treatment was a key methodological difference from previous safety behaviour work with claustrophobic participants, which prevented the misattribution of safety to the aids and facilitated cognitive change.

Other research has demonstrated that even when safety aids are not faded, they do not necessarily exert deleterious effects on fear reduction and cognitive change. For instance, Milosevic and Radomsky's (2008) investigation into the impact of safety gear use by snake-fearful individuals during a 45-minute exposure session with a live snake showed no deleterious effects of safety gear use, with participants who used and who did not use safety gear both demonstrating comparable and robust pre- to post-treatment changes in fear and maladaptive cognitions. In this study, participants who used safety gear approached the snake more closely during the early stages of the exposure session, suggesting that safety gear promoted approach behaviour and possibly the acquisition of disconfirmatory information about the threat.

Similarly, in a recent study of the effects of safety behaviour on fear reduction during exposure for spider fear, Hood et al. (2010) found that participants who were encouraged to use safety behaviour during a two-stage 35-minute exposure task experienced significant reductions in self-reported fear and negative beliefs. Safety behaviour was not faded during the exposure task. These gains were comparable to those of participants who were discouraged from using safety behaviour during exposure and they remained stable for both groups at a 1-week follow-up assessment, leading the authors to conclude that use of safety behaviour "did not preclude meaningful changes in beliefs and associated functioning" (p. 1167).

Taken together, the existing literature both supports the role of safety behaviour in the maintenance of threat perceptions and suggests that, in some instances, safety strategies might be valuable in *facilitating* disconfirmatory experiences. Much of the previous experimental research has been limited by a confound of differing treatment

rationales and/or methods in the context of the safety behaviour manipulation (McManus et al., 2008; Salkovskis et al., 1999; Sloan and Telch, 2002, Wells et al., 1995). Several studies have, however, presented the same treatment rationale to all experimental groups (Deacon et al., 2010; Powers et al., 2004; Sy et al., 2011). In this work, participants were informed of role of unrealistic threat beliefs in the maintenance of fear, but the emphasis in the rationale was nevertheless placed on the importance of repeated exposure for fear reduction rather than on the acquisition of fear-disconfirming information for belief change. One recent study has included a condition of safety behaviour use explicitly under a cognitive rationale (Hood et al., 2010); still, the intervention in this protocol focused on progressive exposure rather than on cognitive strategies.

Cognitive interventions have typically been paired with instructions to reduce or eliminate safety behaviour, a design consistent with current cognitive models of anxiety (Clark, 1999; Salkovskis, 1991). It is possible, however, that the facilitative effects of safety behaviour might be enhanced when its judicious use is embedded within a paradigm of cognitive reappraisal. The present study thus aimed to extend previous work on the impact of safety behaviour on corrective information acquisition by introducing a condition of encouraged safety behaviour use in the context of a behavioural experiment targeted to test negative beliefs (i.e., a cognitive intervention).

My primary hypothesis was that use of safety behaviour would not interfere with information acquisition and disconfirmation of negative beliefs. Thus, I expected all participants to demonstrate significant positive changes in their spider- and self-related negative beliefs following the behavioural experiment, but I anticipated that participants who used safety gear during the session would benefit from greater changes in these

beliefs. Participants who used safety gear, compared to those who did not, were expected to attain a closer distance of approach to the spider, which might enable them to gather more therapeutic information about it. Overall, I predicted that safety gear would not preclude cognitive change and that it might instead serve to facilitate it. This study additionally evaluated changes in self-efficacy, perceived-control, and subjective anxiety, and I expected that the safety gear group would demonstrate greater improvements on these measures than the control group. Treatment acceptability was also assessed and, as predicted by Rachman et al. (2008), I anticipated that participants who used safety gear would provide ratings of greater treatment acceptability than those who did not use it.

Method

Participants

Recruitment. Participants were recruited from two universities and their surrounding communities in Montreal, Canada. Recruitment methods included classroom announcements, posters, and online classified advertisements. Individuals who expressed interest in participating were screened for spider fearfulness with a questionnaire assessing fear of eight items/situations, including spiders, on a 7-point Likert scale (see Appendix A). Those who endorsed either of the two highest fear ratings for spiders, "very much fear" or "terror", were invited to participate in the study provided they did not report symptoms of depression during a brief screening interview based on criteria from the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 2000). An additional eligibility criterion was incorporated into the baseline assessment of the study: participants who were able to place their hand in a

tank with a live spider during an initial behavioural approach test (BAT) were excluded from further testing.

Overall, 144 individuals met eligibility criteria during the first screening procedure and agreed to attend a single test session in the laboratory. They were compensated at a rate of $10/hour. Seventeen participants placed their hand in the spider tank during an assessment BAT and were excluded from subsequent procedures. One additional participant, who completed the study, was excluded from analyses for failing to comply with the experimental protocol. Analyses were conducted with the remaining 126 participants.

Participant characteristics. Participants ranged in age from 18 to 62 years (M = 23.37, SD = 5.98) and 92.1% were women. The majority of participants identified their ethnic background as European (65.9%), with the rest identifying as Middle Eastern (6.3%), multi-ethnic (6.3%), Hispanic (4.8%), South Asian (4.8%), African Canadian (3.2%), East Asian (2.4%) and other (.8%). Seven participants (5.6%) did not identify their ethnicity. None of the participants had previously received treatment for spider fear. Their scores on the specific phobia section of the Anxiety Disorders Interview Schedule for the DSM-IV (Di Nardo, Brown, & Barlow, 1994), the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988), and the Beck Depression Inventory-II (Beck, Steer, & Brown, 1996) indicated that this was a sub-clinical sample (see Table 2.1). Eleven (8.7%) participants met criteria for spider phobia. However, participants' baseline scores on two spider fear indices (Fear of Spiders Questionnaire and spider-related beliefs subscale of Spider Phobia Beliefs Questionnaire; see below) were comparable to those of clinically

Table 2.1

Participant Characteristics by Group

Variable	Condition	
	Safety Gear (*n*=63)	Control (*n*=63)
Female *n* (%)	58 (92.10)	58 (92.10)
Age *M* (*SD*)	23.16 (4.99)	23.57 (6.88)
ADIS-IV-SP *M* (*SD*)	3.05 (.46)	3.05 (.38)
BAI *M* (*SD*)	10.63 (7.94)	9.60 (7.40)
BDI-II *M* (*SD*)	8.97 (7.71)	7.35 (5.84)

Note. ADIS-IV-SP = Specific Phobia Section of the Anxiety Disorders Interview Schedule for the DSM-IV; BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory-II.

phobic populations (Arntz, Lavy, Van den Berg, & Van Rijsoort, 1993; Muris & Merckelbach, 1996).

Measures

Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV). The ADIS-IV (Di Nardo et al., 1994) is a semi-structured and commonly used standardized clinical interview schedule designed to assess current diagnoses of anxiety, mood, somatoform, and substance use disorders consistent with DSM-IV criteria. Participants were administered the specific phobia section of the schedule in order to assess their diagnostic status for the disorder. This measure has demonstrated excellent inter-rater reliability for a current principal diagnosis of specific phobia (k = .86; Brown, Di Nardo, Lehman, & Campbell, 2001).

Beck Anxiety Inventory (BAI) and Beck Depression Inventory-II (BDI-II). The BAI (Beck et al., 1988) and BDI-II (Beck et al., 1996) are standardized and well used 21-item self-report measures assessing state anxiety and depressive symptoms, respectively. They have been shown to have excellent psychometric properties (BAI α = .92, Beck et al., 1988; BDI-II α = .93, Beck et al., 1996). In the current study, both measures demonstrated good internal consistency (BAI = .87; BDI-II α = .88). They were administered in order to collect normative data about the sample.

Fear of Spiders Questionnaire (FSQ). The FSQ (Szymanski & O'Donohue, 1995) is an 18-item self-report measure designed to assess spider phobia. Total scores range from 0 to 126, with higher scores indicating greater fear. The FSQ discriminates between phobic and non-phobic individuals and is sensitive to decrements in phobic

responding during treatment. In a study of female participants with spider phobia, the mean pre-treatment score was 89.1 (*SD* = 19.6). Following exposure treatment, the score in this sample declined to 39.9 (*SD* = 25.4; Muris & Merckelbach, 1996). The FSQ has been shown to have excellent internal consistency (α = .92; Szymanski & O'Donohue, 1995) and test-retest reliability (*r* = .91), as well as adequate convergent validity (Muris & Merckelbach, 1996). In the current study, it demonstrated excellent internal consistency across two administrations (mean α = .91). It was administered to assess the degree of spider fear before and after a behavioural experiment.

Self-Efficacy Rating Scale. This measure, which assesses task performance beliefs, was adapted from the work of Bandura and Adams (1977). It requires participants to rate their degree of certainty in their ability to perform a specific task on a scale from 0 to 100 (0 = "completely uncertain", 100 = "completely certain"). This scale has been widely used in studies investigating self-efficacy (e.g., Zoellner, Echiverri, & Craske, 2000). In the current study, it was administered orally to assess participants' degree of certainty about being able to approach a spider during a behavioural approach test.

Behavioural Approach Test (BAT). The BAT is a commonly used behavioural index of fear in anxiety disorders research. In the present study, participants were instructed to approach the spider as closely as they are able, yielding a distance measure coded along a 33-step hierarchy (see Appendix B), ranging from standing outside the therapy room with the door closed to holding the spider. Greater numbers on the hierarchy indicate a closer proximity to the spider.

Subjective Units of Distress Scale (SUDS). The SUDS (Wolpe, 1958) is a widely used measure of subjective fear during exposure-based exercises. It enables

participants to quickly rate their current reactivity on scale of 0 to 100, with 0 being no distress and 100 being the worst imaginable distress. It was administered at the closest distance of approach during the BATs.

Anxiety Control Questionnaire-Revised (ACQ-R). The ACQ-R (Brown, White, Forsyth, & Barlow 2004) is a 15-item self-report measure that assesses perceived ability to control anxiety-related emotional reactions and external threats. Total scores range from 0 to 75, with higher scores indicating greater perceived control. The global scale of this measure was shown to have good internal consistency with both clinically anxious (α = .85; Brown et al., 2004) and nonclinical participants (α = .87; Moulding & Kyrios, 2007). It also demonstrated good internal consistency across three administrations in the current study (mean α = .85). The ACQ-R was administered to assess participants' perceptions of control over emotions, stress, and threat during a behavioural approach to a spider. Modified instructions asked participants to rate to what extent each statement was characteristic of them while they were in the presence of the spider.

Spider Phobia Beliefs Questionnaire (SBQ). The SBQ (Arntz et al., 1993) is a self-report measure of negative beliefs about spiders and about one's reactions when encountering a spider, assessed with 42-item and 36-item subscales, respectively. Participants are asked to rate the strength of their beliefs along a 100-point scale, with 0 = "do not believe it at all" and 100 = "absolutely believe it". Scores are obtained by calculating the mean rating for each subscale. The SBQ has demonstrated sensitivity to the effects of treatment. Scores in a sample of patients with spider phobia before and after exposure treatment were 48.76 (*SD* = 17.74) and 10.15 (*SD* = 13.69) for the spider-related beliefs subscale, respectively, and 49.79 (*SD* = 18.72) and 8.00 (*SD* = 13.15) for

self-related beliefs subscale, respectively (Arntz et al., 1993). The SBQ has been shown to have excellent internal consistency for both the spider-related (α = .94) and self-related (α = .94) belief subscales (Arntz et al., 1993), which was also observed in the current study across two administrations (spider-related beliefs, mean α = .96; self-related beliefs, mean α = .94). The SBQ has also demonstrated acceptable test-retest reliability (spider related, r = .64; self-related, r = .71; Arntz et al., 1993). It was administered in the current study as a primary measure of belief change.

Safety Behaviour Inventory (SBI). The SBI is a 22-item self-report measure developed by the author of the current study to assess respondents' perceived need to rely on a broad range of covert and overt safety behaviours during anxiety-provoking situations. Respondents are required to indicate to what extent given strategies were essential to their ability to endure a specific situation, with response options coded along a 6-point Likert scale ranging from "did not use" (0) to "extremely essential-could not have endured situation without it" (5). The SBI was administered to ensure equality of groups with regard to non-safety gear safety behaviour (i.e., to ensure that participants in the control group were not supplementing the absence of safety gear with additional strategies during their exposure to the spider). This measure has demonstrated good internal consistency in samples of nonclinical (αs = .84 - .85) and clinically anxious (α = .89) participants (see Study 3). In the current study, it had acceptable internal consistency (α = .71).

Endorsement and Discomfort Scale. This 10-item self-report scale was developed by Tarrier, Liversidge, and Gregg (2006) for research on treatment preference and acceptability. It includes dimensions assessing acceptability, suitability, tolerability,

expectation of positive benefit, credibility, efficacy, appropriateness, reasonableness, justifiability, and discomfort. Tarrier et al. (2006) found that the first nine dimensions loaded onto a factor that they conceptualized as treatment endorsement, and a second component, which included just the remaining item, was labelled as treatment discomfort. This measure was administered to determine to what extent participants would find the types of therapeutic procedures used in the study as an acceptable treatment option in a clinical setting. In the current study, the treatment endorsement scale demonstrated excellent internal consistency ($\alpha = .94$).

Spider and Exposure Room

The fear stimulus was a docile Chilean Rose tarantula (11 cm diameter). The tarantula was presented to the participants in an empty clear plastic terrarium (33 cm x 19 cm x 16 cm) with a removable lid. The terrarium was placed on a 110 cm-high cabinet located in a corner of the room that was be used for exposing participants to the spider.

The room in which participants were exposed to the spider was 3.13 x 2.30 m (see Appendix C for room layout). Distance markers with intervals of 0.30 m were be placed on the floor in red tape, spanning the farthest to the closest distance to the spider terrarium (i.e., 2.74 m), which facilitated the measurement of distance of approach during the BATs.

Procedures Common to Both Groups

Participants were tested individually in a laboratory setting. All procedures not involving the spider were conducted in a room different from the one in which the spider tasks (i.e., BATs, behavioural experiment) took place. With the exception of the pre- and post-intervention BATs, all procedures were conducted by the author, who followed a

standardized protocol. The pre- and post-intervention BATs were conducted by a research assistant who was blind to participants' condition and who also adhered to a standardized protocol.

After providing informed consent, participants were administered the phobia section of the ADIS-IV. They then completed the BAI, the BDI-II, and the FSQ, followed by a baseline BAT. Before they approached the spider, participants were asked to provide ratings of certainty regarding their ability to approach it (i.e., self-efficacy). At the distance of closest approach, they provided a SUDS rating. They then completed the ACQ-R and the SBQ. The experimenter then explained to them that the next part of the study would involve a 20-minute activity with the spider. At this point, participants were randomly assigned to one of the two conditions, safety gear or control, and those who were in the safety gear condition were given the opportunity to select items to take with them to the session with the spider (see *Conditions* below).

Participants were next guided through a 20-minute behavioural experiment during which they were required to gather information to challenge a negative belief about the spider (see *Rationale and Behavioural Experiment* below). During this task, SUDS ratings and the distance from the spider were recorded at 5-minute intervals. At the end of the session, the experimenter guided participants through another BAT (with protective gear still worn by those in the safety gear condition) and collected data on self-efficacy, as well as a SUDS rating at closest approach.

Following the behavioural experiment, participants completed the ACQ-R again, as well as the SBI. They were given 20 minutes to complete these measures (which take approximately 5-10 minutes to complete). For the remainder of the time, they were

provided with magazines as a filler task. Thus, there was a standardized 20-minute delay between the end of the behavioural experiment and the re-administration of baseline measures, which consisted of the FSQ, the BAT (including self-efficacy and SUDS ratings obtained prior to and at the closest approach to the spider, respectively), the ACQ-R, and the SBQ. All participants completed the behavioural component of this final assessment without the use of safety gear. Participants also completed the Endorsement and Discomfort Scale, and responded to additional questions about treatment acceptability. They were then be debriefed and compensated for their time.

Conditions

Participants assigned to the safety gear condition were shown a selection of 14 safety items, such as gloves of various sizes, head covers, and goggles (see Appendix D for complete list of items). The items were described as gear that might be helpful to them while they are in the room with the spider. They were instructed to select any number of items, with as few as one and as many as all of them. Participants in the control condition were not made aware of the safety gear and proceeded immediately to the next part of the study.

Rationale and Behavioural Experiment

All participants were provided with a cognitive rationale for the treatment of spider fear, emphasizing the importance of acquiring information to test negative beliefs. The experimenter worked with each participant to select his/her most strongly held negative belief based on the SBQ (for participants who endorsed several equally strong beliefs, standardized guidelines were offered for helping them to select just one). Once they selected a belief, they received detailed instructions for how to proceed during the

20-minute session with the spider. The session was framed as a behavioural experiment, and participants were instructed to acquire as much information as possible to test the accuracy of their negative spider belief.

The behavioural experiment was conducted in the presence of the experimenter but was guided by the participants, who were instructed to move around the room freely and at their own pace (if they elected to do so, they were permitted to touch or hold the spider). The experimenter's role during this part of the study was to record, at 5-minute intervals, whether participants had removed the lid from the spider terrarium and to query them for SUDS ratings. The experimenter additionally provided a standardized instructional reminder (e.g., "Keep in mind that your goal is to obtain information to test the accuracy of your belief that...") at the 5, 10, and 15-minute assessment points.

Results

Baseline Comparability of Groups

Participant characteristics. Participants in the safety gear and control groups did not differ in terms of age, $t(121) = .38$, $p = .70$., or sex, $\chi^2(1, N = 126) = .00$, $p = .63$. They were also similar in terms of the severity rating on the specific phobia section of the ADIS-IV, $t(124) = .00$, $p = 1.00$, and the mean total scores on the BAI, $t(124) = .76$, $p = .45$, and the BDI-II, $t(124) = 1.33$, $p = .19$ (see Table 2.1 for means and standard deviations).

Outcome measures. A series of independent samples *t*-tests was conducted to ensure the baseline equivalence of groups for the outcome measures. There were no significant baseline differences between conditions on the FSQ, $t(124) = .05$, $p = .96$, Cohen's $d = .01$, on the SBQ spider-related beliefs subscale, $t(124) = .65$, $p = .52$,

Cohen's d = .12, and the self-related beliefs subscale, $t(124) = 1.31$, $p = .19$, Cohen's d = .23. There were also no between-group differences in terms of self-efficacy (SE), $t(124)$ = .65, $p = .52$, Cohen's d = .12, distance of approach to the spider, $t(124) = .62$, $p = .54$, SUDS ratings at distance of closest approach, $t(120) = 1.05$, $p = .28$, Cohen's d = .11, and in terms of ACQ-R scores, $t(123) = .47$, $p = .64$, Cohen's d = .09.

Effectiveness of Behavioural Experiment

Cognitive change. To assess the impact of the behavioural experiment on participants' change in maladaptive spider- and self-related beliefs, a 2 x 2 (condition x time) repeated measures ANOVA was conducted for each of the two SBQ subscales. Participants in both groups improved equally and robustly both in terms of their beliefs about spiders, $F(1, 24) = 196.43$, $p < .001$, partial $\eta^2 = .61$, and in terms of their beliefs about themselves in the presence of a spider, $F(1, 23) = 199.17$, $p < .001$, partial $\eta^2 = .62$ (see Figure 2.1). No significant condition x time interactions or between-participant effects were observed for either spider-related beliefs, $F(1, 124) = .67$, $p = .41$, partial η^2 = .01 and $F(1, 124) = .08$, $p = .77$, partial $\eta^2 = .001$, respectively, or for self-related beliefs, $F(1, 123) = 2.47$, $p = .12$, partial $\eta^2 = .02$ and $F(1, 123) = .72$, $p = .40$, partial η^2 = .01, respectively.

Fear change. To assess the effect of the behavioural experiment on self-reported fear of spiders, a 2 x 2 repeated measures ANOVA was conducted for the FSQ. A significant main effect of time was observed, with participants in both groups experiencing a pre- to post-intervention decline in spider fear, $F(1, 124) = 151.63$, $p <$ .001, partial $\eta^2 = .55$. There were no significant interaction, $F(1, 124) = .32$, $p = .58$,

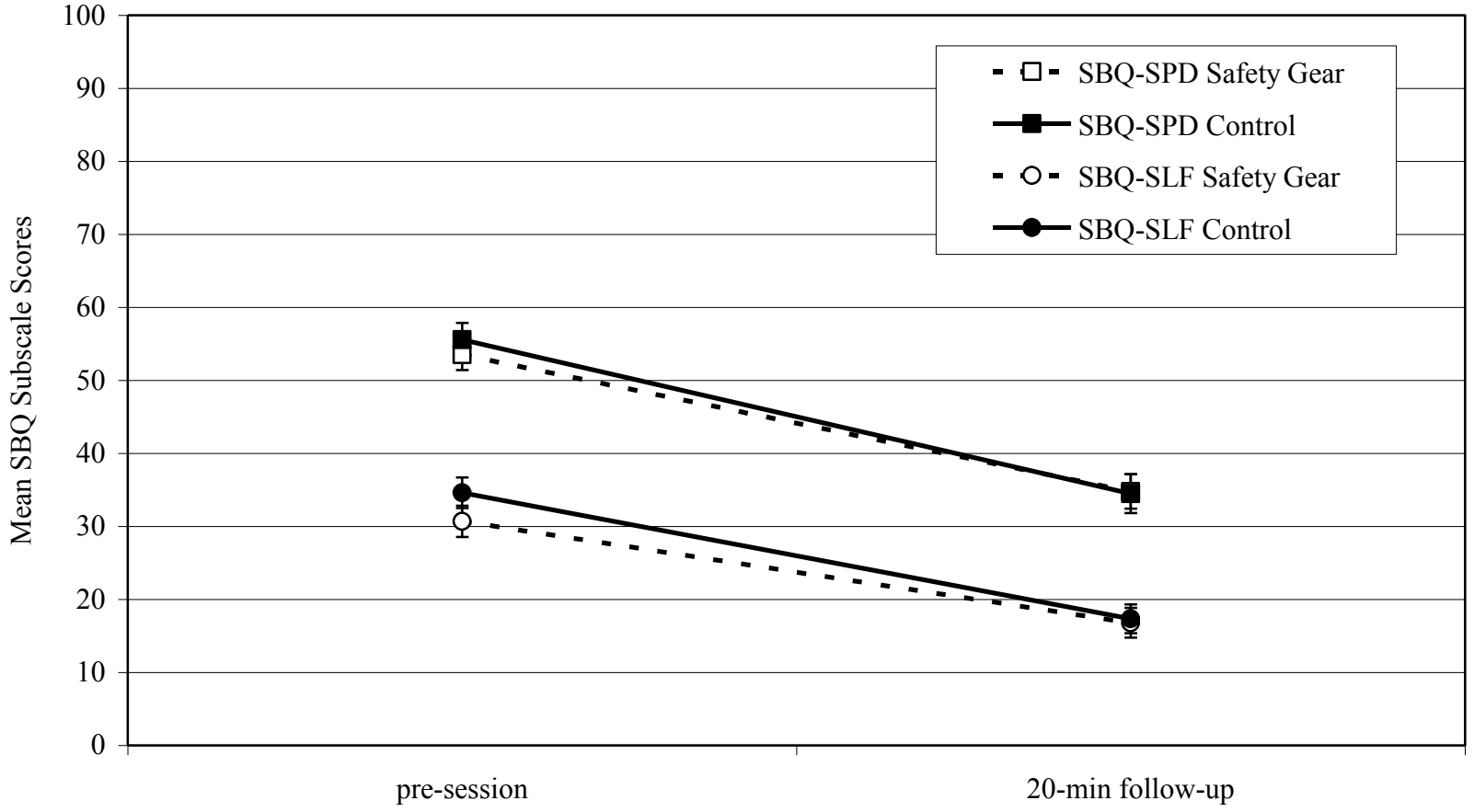

Figure 2.1. Spider- and self-related beliefs before and after the behavioural experiment. SBQ-SPD = Spider Phobia Beliefs Questionnaire—Spider-Related Beliefs Subscale; SBQ-SLF = Spider Phobia Beliefs Questionnaire—Self-Related Beliefs Subscale.

partial $\eta^2 = .003$, or between-participant effects, $F(1, 124) = .07$, $p = .80$, partial $\eta^2 = .001$, for this measure.

Participants' distance of closest approach to the spider during three BATs (before, immediately after, and 20 minutes after the behavioural experiment) and their SUDS ratings at this distance were subjected to 2 x 3 (condition x time) repeated measures ANOVAs[1]. A significant main effect of time was observed for each measure, indicating that both groups increased their proximity to the spider across the BAT assessments, $F(1.38, 170.26) = 242.08$, $p < .001$, partial $\eta^2 = .66$, and they reported lower subjective distress at the distance of closest approach, $F(1.86, 221.53) = 25.14$, $p < .001$, partial $\eta^2 = .17$. There were no significant interactions or between-participant effects for either of these measures, all Fs < .89, ps > .41, indicating comparable improvement across the assessment points and between conditions (see Table 2.2 for means and standard deviations of fear measures).

Change in self-efficacy and perceived control. Self-efficacy ratings taken prior to each BAT and ACQ-R scores obtained after each approach to the spider were subjected to 2 x 3 (condition x time) repeated measures ANOVAs. The analyses revealed a main effect of time for each measure, with participants across both conditions reporting greater certainty in their ability to approach the spider after the behavioural experiment[1], $F(1.10, 135.60) = 41.13$, $p < .001$, partial $\eta^2 = .25$, and greater perceived control during the approach[1], $F(1.64, 199.74) = 70.10$, $p < .001$, partial $\eta^2 = .37$ (see Table 2.2 for means and standard deviations). There were no significant between-participant or interaction effects for ratings of self-efficacy, and there was no between-participant effect for scores on the ACQ-R, F's < 1.04, ps >.31. There was, however, a small but significant

Table 2.2

Descriptive Statistics of Outcome Measures at Three Assessment Points

	Pre-Session		End-of-Session		Post-Session	
	Safety Gear (n = 63)	Control (n = 63)	Safety Gear (n = 63)	Control (n = 63)	Safety Gear (n = 63)	Control (n = 63)
Measure	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
FSQ	83.74 (20.78)	83.56 (20.48)	--	--	58.14 (27.17)	60.19 (24.22)
SBQ-SPD	53.51 (16.70)	55.55 (18.49)	--	--	34.77 (18.66)	34.48 (21.18)
SBQ-SLF	30.68 (17.10)	34.60[c] (16.63)	--	--	16.79 (16.17)	17.35[c] (15.60)
SE	79.13[c] (24.84)	76.51 (26.03)	92.2[c] (14.37)	93.38 (18.21)	92.08[c] (13.10)	94.98 (15.34)
BAT	10.90 (6.81)	11.71 (7.82)	23.06[c] (9.96)	24.35 (8.77)	24.29 (9.07)	24.97 (8.83)
SUDS	68.31[c] (21.80)	72.20[a] (17.85)	68.16[c] (23.47)	65.83 (25.23)	55.44 (24.16)	54.78 (27.14)
ACQ-R	34.89 (10.48)	33.87[b] (10.22)	37.32 (10.70)	39.84[b] (10.93)	41.40 (11.64)	44.49[b] (10.82)

Note. FSQ = Fear of Spiders Questionnaire; SBQ-SPD = Spider Phobia Beliefs Questionnaire—Spider-Related Beliefs Subscale; SBQ-SLF = Spider Phobia Beliefs Questionnaire—Self-Related Beliefs Subscale; SE = Self-Efficacy; BAT = Behavioural Approach Test; SUDS = Subjective Units of Distress Scale; ACQ-R = Anxiety Control Questionnaire-Revised.

[a] n = 60, [b] n = 61, [c] n = 62.

interaction effect[1] for the ACQ-R, indicating greater improvement in perceived control for participants who did not rely on safety gear, $F(1.64, 199.74) = 4.74$, $p = .02$, partial $\eta^2 = .04$. Follow-up *t*-tests of between-group differences of change scores on the ACQ-R between each of the three assessment points suggest that participants in the control group experienced greater increases in perceived control between the baseline BAT and the BAT immediately following the behavioural experiment, $t(123) = 2.43$, $p = .017$, Cohen's $d = .43$, as well as between the baseline BAT and the final post-session BAT, $t(122) = 2.36$, $p = .02$, Cohen's $d = .42$. The adjusted significance level after a Bonferroni correction was .017, thus only the former difference can be considered significant.

Time-Course Analysis of Behavioural Experiment

To asses the impact safety behaviour on initial fear reduction during exposure, the session was divided into four intervals (0 to 5 minutes, 5 to 10 minutes, 10 to 15 minutes, and 15 to 20 minutes). Independent samples *t*-tests were then conducted for distance of approach and SUDS ratings at each interval. Use of safety behaviour was found to have a significant effect on the distance of approach during the first interval, $t(101) = 2.06$, $p = .04$, Cohen's $d = .41$, with participants in the safety behaviour group ($M = 6.75$, $SD = 5.77$), demonstrating a greater increase in their approach to the spider than controls ($M = 4.73$, $SD = 4.06$) during the first 5 minutes of the behavioural experiment (see Figure 2.2). A significant difference was further observed for SUDS ratings during the second interval, $t(124) = 3.11$, $p = .002$, Cohen's $d = .55$, with participants in the control group reporting a decrease in subjective distress between 5 and 10 minutes ($M = -5.49$, $SD = 14.92$), whereas participants in the safety behaviour group reported an increase in subjective distress during this interval ($M = 2.94$, $SD = 15.46$; see Figure 2.2).

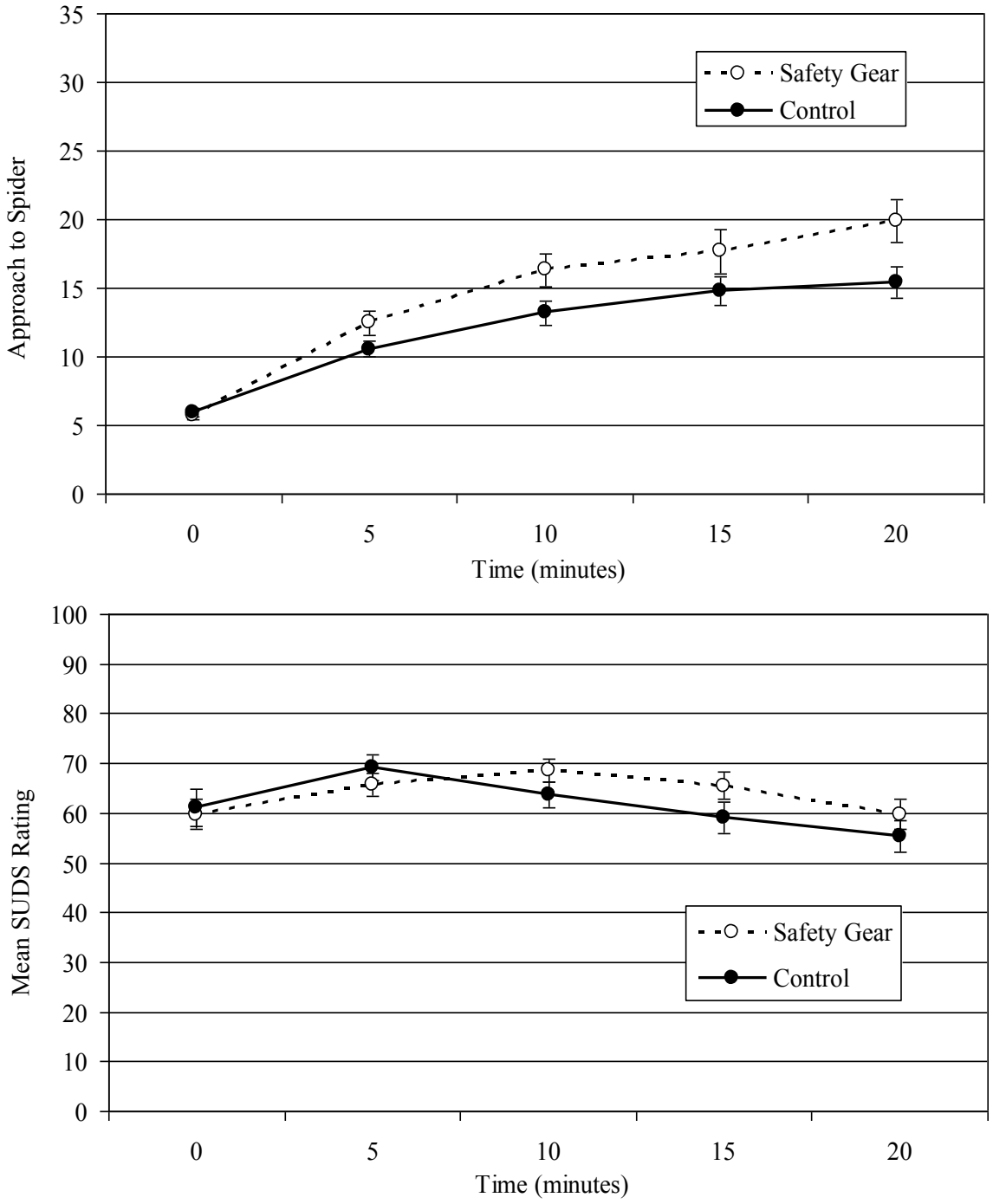

Figure 2.2. Distance of approach to the spider and subjective distress during the behavioural experiment. SUDS = Subjective Units of Distress Scale.

To eliminate a possible bias from the examination of approach behaviour[2], a secondary analysis was performed with a focus on whether participants had chosen to remove the lid from the terrarium while gathering information about the spider (data was available for the entire sample for this measure). A chi-square test was conducted for five assessment points (taken at 5-minute intervals, beginning with 0 minutes) during the behavioural experiment. Two trends emerged, at 10 minutes, $\chi^2(1, N = 126) = 2.93$, $p = .09$, $\Phi = .15$, and at 15 minutes, $\chi^2(1, N = 126) = 2.64$, $p = .10$, $\Phi = .15$, indicating that more participants in the safety gear condition were willing to remove the lid from the spider terrarium to test their beliefs at these assessment points (see Figure 2.3).

Safety Behaviour Utilization

Safety gear condition. The mean number of safety items selected by participants in the safety gear condition was 1.53 ($SD = 1.14$). The most frequently selected items were a pair of long gloves, a pair of short gloves, and a protective jacket, selected by 48.40%, 25.80%, 17.70% of participants, respectively. Twenty-one different combinations of items were selected. I examined whether this idiosyncratic selection was associated with particular types of cognitions. Safety gear items were divided into four categories that represented the area of the body on which they were worn, thus the area which was protected. These included the head/face (3 items), upper body not including the head (3 items), arms/hands (4 items), and legs/feet (4 items). Categories of cognitions were represented by the two SBQ subscales. Correlational analyses indicated that self-related beliefs were significantly positively associated with all categories of safety gear (all rs = .29, $p < .05$), whereas there were no significant associations between any of these categories and spider-related beliefs (rs <.17). Thus, it appears that participants'

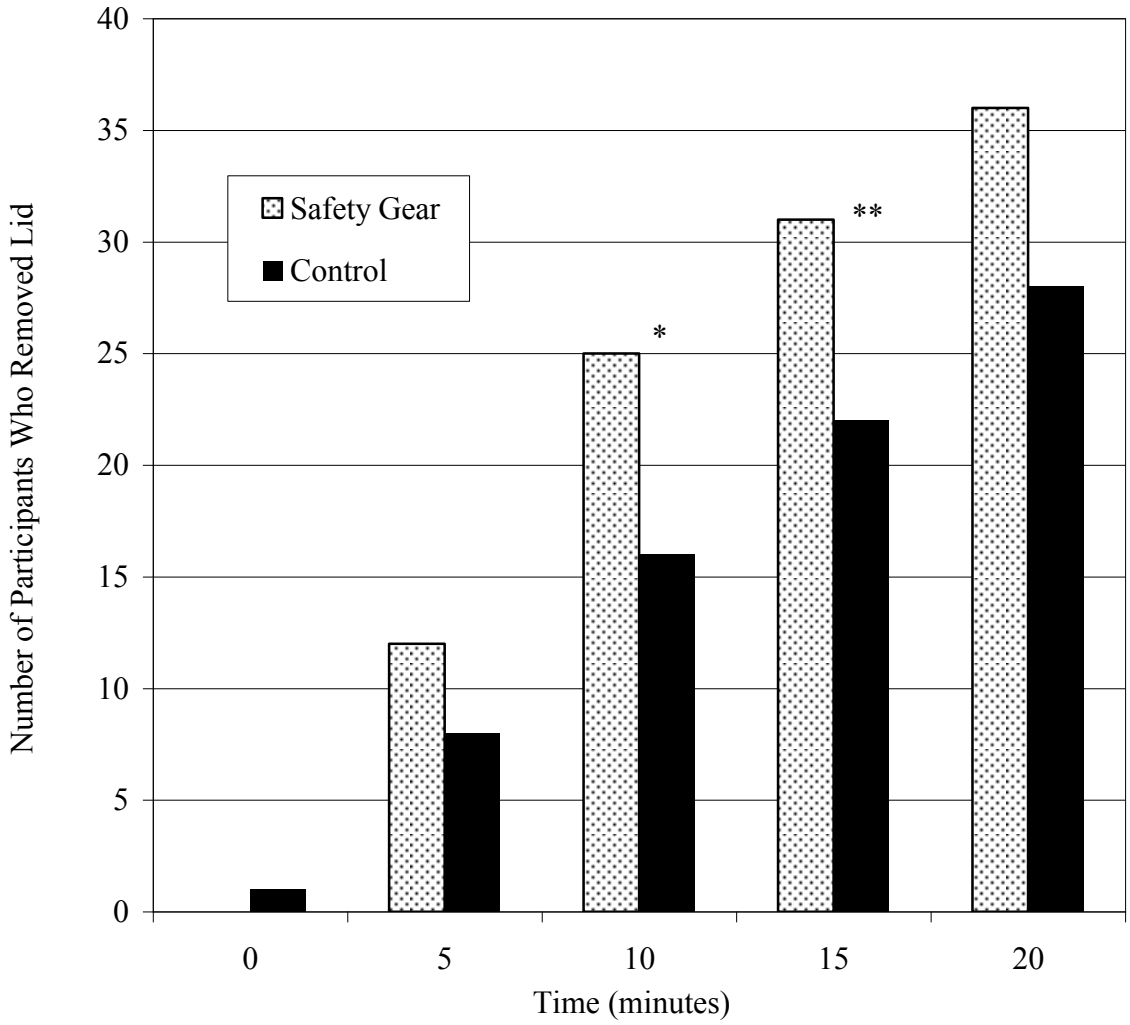

Figure 2.3. Participants who removed the lid from the spider terrarium during the behavioural experiment. *p=.09, **p=.10.

selection of safety gear was informed by their concerns about their reactions when encountering a spider more so than by their expectations about the spider's behaviour.

Covert safety behaviour utilization. To evaluate whether there were between-group differences in participants' use of covert and/or non-safety gear safety behaviour, an independent samples *t*-test was conducted on the mean SBI scores. There were no significant differences between groups on this measure, $t(124) = 1.15$, $p = .25$, Cohen's $d = .20$, indicating that participants in the control group did not disproportionately rely on other safety behaviours in the absence of safety gear. The mean number of reported safety behaviours used during the behavioural experiment across both conditions was 11.75 ($SD = 4.02$). Participants' mean rating of their perceived need to rely on these safety behaviours was 3.19 ($SD = .69$), indicating that they perceived them as being somewhat essential (i.e., they could have endured situation without them but with some difficulty). The most frequently endorsed safety strategies employed by participants across both conditions included moving about very slowly (96.80%) and trying to control one's thoughts (90.40%).

Treatment acceptability. Independent samples *t*-tests of mean scores on the treatment endorsement and discomfort scales were conducted to determine whether the use of safety gear during the behavioural experiment affected participants' perceptions of the acceptability of this method. No significant between-group difference was observed for treatment endorsement, $t(123) = .71$, $p = .48$, Cohen's $d = .13$. Both groups highly endorsed the behavioural experiment, with a mean item score of 7.26 on a 9-point Likert scale where 9 was the highest possible endorsement. There was a trend for a group difference on the discomfort scale, $t(123) = 1.69$, $p = .09$, Cohen's $d = .30$, with

participants in the control group reporting greater discomfort than those in the safety gear group at the prospect of accepting a treatment for their spider fear that incorporated elements such as the behavioural experiment from the current study.

Discussion

The purpose of this study was to examine the effect of safety behaviour use on change in negative beliefs during a brief behavioural experiment. By contrast to existing safety behaviour research, which has focused largely on the impact of safety behaviour in the context of graduated exposure, this study paired encouraged use of safety behaviour with a cognitive intervention. My hypothesis that participants' use of safety gear would not interfere with their acquisition of disconfirmatory information was supported. Participants who used and who did not use safety gear benefited from comparable and significant declines in the strength of their spider- and self-related negative beliefs following a behavioural experiment. The finding that use of safety gear did not preclude cognitive change is consistent with several recent studies in this domain (Deacon et al., 2010; Hood et al., 2010; Milosevic & Radomsky, 2008), as well as with earlier work (de Silva & Rachman, 1984; Rachman et al., 1986).

The prediction that participants who used safety gear would achieve greater cognitive change, however, was not supported, as there were no between-group differences on the SBQ. Use of safety gear did facilitate a closer approach to the spider during the behavioural experiment, which I anticipated was the mechanism that might promote superior cognitive change in this group. Those in the safety gear group approached the spider more closely during the first 5 minutes of the session. As this analysis did not permit the inclusion of all participants' approach behaviour, I also

analyzed whether safety gear had an effect on participants' choice to remove the lid from the terrarium while gathering information about the spider. The results suggest that compared to those in the control group, participants who used safety gear were willing to expose themselves to a more threatening situation (i.e., terrarium with removed lid) in order to gather information about the threat stimulus. The safety gear group experienced an increase in subjective distress following the interval in which they benefited from a closer approach to the spider, which is unsurprising as an initial increase in proximity to a feared stimulus is likely to temporarily increase distress. No between-group differences in subjective distress were evident during two subsequent assessments.

These findings thus support the hypothesis that use of safety behaviour in the context of an information gathering session would enable participants to acquire information while in greater proximity to the threat stimulus. The results are consistent with previous work by Milosevic and Radomsky (2008), as well as with more recent findings from Hood et al. (2010), who observed a more rapid rate of approach to a spider by participants who were encouraged to use safety behaviour. In the current study, as in previous research, this initial difference in rate of approach appears to yield no advantage in terms of the distance of approach at the end of the treatment session and in terms of cognitive change and fear reduction. Indeed, participants in the control group ascended the exposure hierarchy by approximately 10 steps during the BAT that immediately followed the final assessment point in the behavioural experiment, effectively "catching up" to those in the safety gear group. One reason for this might be the shift from an exploratory, unstructured exposure task to one that specifically encourages approach

behaviour. Perhaps in the absence of safety gear, participants were less likely to readily volunteer to approach the spider, whereas they were willing to do so if asked explicitly.

Another possible explanation for the control group's gain in approach between these two assessment points is a change in sample composition, as the distance of approach was not coded for all participants during the behavioural experiment. Whereas different methodology, such as asking participants to gather information while adhering to steps on a standardized approach hierarchy, would have allowed for the assessment of everyone's behaviour during the session, it would have also hindered the idiosyncratic nature of participants' information-gathering strategies. For instance, one participant who was concerned that the spider was unpredictable tested this belief by turning off the lights, whereas another, who believed the spider would come toward him, placed it on the floor and observed whether it followed him. Such range of behaviour was not codable along the standardized hierarchy used in this study. While some participants could have adapted their methods of belief testing to a more restrictive protocol, others might have been unable to do so effectively, thus compromising the ecological validity of the study.

The results further demonstrated that use of safety gear did not impair fear change. Both groups experienced significant pre- to post-session reductions in fear based on a self-report measure, a behavioural index, and SUDS ratings. These findings are broadly consistent with a growing literature showing that the incorporation of safety behaviour in exposure-based treatments is not necessarily detrimental (Deacon et al., 2010; Hood et al., 2010; Milosevic & Radomsky, 2008; Rachman et al., 2011; van den Hout et al., 2011). I also found that participants in both groups experienced significant and comparable increases in self-efficacy, reflecting an increase in confidence about

approaching the spider, a finding similar that of Hood et al. (2010). Participants who did not use safety gear, however, benefited from a greater increase in perceived control between the baseline assessment and the assessment immediately following the behavioural experiment. It is possible that the safety gear group's bolder approach behaviour during the session impacted their sense of control in the situation. Alternatively, it is possible that the offer of safety gear signalled that exposure to the spider might be uncontrollable or unpredictable. Deacon et al. (2010) have similarly discussed the potential for a safety behaviour manipulation to increase participants' perceptions of dangerousness during exposure.

Proponents of the judicious use of safety behaviour cite improvements in treatment acceptability as an important possible benefit of incorporating it into the early stages of exposure-based treatment (Rachman et al., 2008). I examined the effect of safety gear use on treatment acceptability by asking participants to consider receiving a full course of treatment for their spider fear that incorporated elements such as the behavioural experiment from the current study and to provide ratings of endorsement and discomfort for such a treatment. All participants endorsed this treatment to the same extent, indicating that they found it acceptable, credible, and likely to yield positive effects. There was a trend for group differences in discomfort ratings, with those who did not use safety gear reporting greater anticipated discomfort during a treatment that incorporated elements from the current study. This finding provides modest support for the hypothesis that use of safety gear during a behavioural experiment would improve its acceptability. As participants were not treatment-seekers, nor were they clinically anxious, firm conclusions about the impact of safety behaviour on treatment acceptability

cannot be established from these findings. Furthermore, the 20-minute behavioural experiment in this study did not, of course, encompass the full range of interventions in cognitive-behaviour therapy, particularly graduated exposure, which likely poses a greater threat to acceptability.

Whereas participants' use of safety gear did not detract from their overall gains from a brief information gathering session, it also did not confer an advantage over participants who did not use safety gear. It is possible that the safety gear manipulation, consisting of an offer of 14 items that primarily included protective clothing, was too narrow a representation of the full range of idiosyncratic safety behaviours typically used by spider fearful individuals. Although participants were allowed to choose any number of items greater than zero, they chose an average of only one to two items. While this small selection might have been sufficient in targeting specific feared outcomes associated with one's negative beliefs, it is also possible that participants chose so few items because they did not find them relevant to their fear concerns, which might have contributed the absence of group differences on most measures.

Of note, the results indicate that all categories of selected safety gear items were more closely associated with beliefs pertaining to participants' anticipated reactions to the spider (i.e., self-related beliefs, which are similar to those seen in panic disorder; e.g., "I will not be able to stand it", "I will die of fear") than to expectations about the spider itself, suggesting that the availability of other types of safety behaviour might have better addressed these beliefs. This is a somewhat surprising finding, as the safety gear, much of it beekeeping equipment, has a principal function of physical protection, which seems highly suitable for addressing spider-related beliefs such as "The spider will bite me". In

the current research protocol, participants were aware, having completed a baseline BAT, that the spider was in a closed terrarium; perhaps the anticipation that it would remain in the terrarium during the behavioural experiment shifted the perceived protective value of the safety gear from the spider to the participant.

Analysis of the SBI indicated that participants in both groups were relying, to the same extent, on a substantial number of additional safety strategies, which has been previously observed even when participants are explicitly instructed to drop all safety behaviour (e.g., Hood et al., 2010; Morgan & Raffle, 1999). The reliance on additional safety behaviour might have weakened the effects of the experimental manipulation. However, given group differences on several measures, including in-session approach behaviour, perceived control, and treatment discomfort, and in light of several studies with diverse methodology showing a similar absence of group differences in terms of cognitive change and fear reduction, it is also reasonable to conclude that the safety behaviour manipulation was effective.

Two important considerations in reconciling the dramatic differences between studies showing detrimental effects of safety behaviour use and studies showing no such detriments include the distinctions between adaptive coping strategies and safety behaviour and between the *judicious* use of safety behaviour versus safety behaviour that is not faded with the progression of treatment. It is possible that safety gear, which has been shown to facilitate approach to threatening stimuli (Hood et al., 2010; Milosevic & Radomsky, 2008), functions as an adaptive coping strategy that assists participants with enduring exposure-based experiences without hindering the acquisition of disconfirmatory information. By contrast, the type of behaviour that has been encouraged

or retained in safety behaviour conditions in studies showing its detrimental effects (e.g., "focus on yourself", "avoid eye contact"; McManus et al., 2008) clearly has the capacity to interfere with corrective learning. Whereas the difference between adaptive and maladaptive safety strategies in these examples is quite clear, it is also possible for the same types of strategies to promote or detract from disconfirmatory experiences, as emphasized by Thwaites and Freeston (2005). For instance, Deacon et al. (2010) and Powers et al. (2004) provided participants with similar coping aids but observed differential effects on fear reduction, the former facilitative and the latter disruptive. In this case, it appears that the withdrawal of the safety aids during treatment (i.e., their judicious use) was a key factor in determining the impact of the aids. Future research would thus benefit from focusing on the perceived function of safety aids and its impact on treatment outcome and from directly comparing the effects of judicious safety behaviour use to that of safety strategies that are not withdrawn.

Overall, this study implemented a cognitively-focused analysis of the effects of safety gear use by examining its impact on the acquisition of corrective information in the context of a behavioural experiment. Contrary to current cognitive-behavioural models of anxiety disorders, I found that use of safety gear did not preclude cognitive change, nor did it interfere with fear reduction. These findings challenge the notion that safety behaviour must be eliminated from exposure-based treatments of anxiety disorders at all costs. They suggest that it might be possible to successfully incorporate safety strategies into exposure-based interventions, particularly in the early stages of treatment, with the aim of facilitating therapeutic progress. Rachman et al. (2008) emphasized the potential value of increasing acceptability and tolerability of a treatment modality that, despite its

efficacy, suffers from substantial drop-out and refusal rates (e.g., Choy, Fyer, & Lipsitz, 2007; Foa et al., 2005). Although partial support was obtained for the proposed benefits of safety behaviour in terms of treatment tolerability, future studies must clarify this relationship.

As this research did not include a longer term follow-up assessment, it is not known whether belief change was sustained beyond the brief duration of the experimental paradigm. Findings from Rachman et al. (1986) and, more recently, Hood et al. (2010) suggest that gains in corrective learning facilitated by safety behaviour can indeed be maintained in the longer term, as evidenced by their analyses at 3-month and 1-week follow-ups, respectively; however, additional research on this topic is warranted.

The generalizability of the current study is also limited by the use of a sub-clinical spider fearful sample. Most studies that have found no detrimental effects of safety behaviour use during exposure-based treatments have focused on phobic fear. This raises the possibility that the role of safety behaviour during treatment of specific phobias is distinct from its role in the treatment of other anxiety disorders (for a discussion on this topic, see Hood et al., 2010). However, recent evidence suggests that safety behaviour might also have facilitative effects in the treatment of contamination fear in obsessive-compulsive disorder (Rachman et al., 2011; van den Hout et al., 2011). The use of a markedly different safety behaviour manipulation in these preliminary studies, compared to safety strategies typically offered in phobia studies, suggests that the facilitative effects of safety behaviour are not limited to use of safety gear or aids.

Additional research is also necessary to elucidate the mechanisms underlying and differentiating adaptive and maladaptive safety strategies. A clear understanding of

reasons for the discrepancies in the current safety behaviour literature, as well as an expansion of the empirical basis of the judicious use of safety behaviour, are necessary for the development of effective safety procedures in exposure-based treatments.

CHAPTER 3

Study 1 applied an experimental paradigm to investigate the effects of safety behaviour use on belief change during a brief behavioural experiment. Spider fearful participants were asked to evaluate the validity of a targeted negative belief about spiders during a 20-minute session with a live tarantula, and they were randomly assigned either to use or to not use protective safety gear during this session. Investigations of the effects of safety behaviour in the context of exposure-based paradigms have typically focused on graded exposure rather than on cognitively-driven strategies. This study thus aimed to evaluate whether using safety behaviour during active belief testing would facilitate change in threat beliefs.

The results demonstrated that negative spider-related beliefs and beliefs about oneself in the presence of a spider improved equally and robustly in both groups after the behavioural experiment. Both groups also benefited from comparable declines in fear and in distance of approach to the spider, as well as increases in self-efficacy about approaching the spider. The control group experienced a greater increase in perceived anxiety control than the safety gear group, particularly between the baseline assessment and one immediately following the behavioural experiment.

During the behavioural experiment, use of safety gear facilitated a closer distance of approach to the spider in the early stages of the session. Participants who used safety gear also demonstrated a tendency to be bolder in their methods of gathering information about the spider. However, contrary to the study hypotheses, between-group differences during the session did not confer an advantage for participants who used safety gear in terms of post-session change in cognition. Given this finding, as well as that of similar

safety behaviour studies showing post-treatment equivalency of groups (e.g., Deacon et al., 2010; Hoode et al., 2010), it is important to consider whether safety behaviour might have other clinical utility that would justify its incorporation into exposure-based treatments.

Rachman and colleagues (2008) proposed that that use of safety behaviour during exposure-based treatments, particularly in the early and possibly most distressing stages of treatment, has the potential to enhance treatment acceptability and to reduce drop-out. Study 1 provided modest support for this hypothesis: the safety gear group endorsed marginally lower ratings of anticipated discomfort than the control group when participants were asked to consider receiving a full course of treatment for their spider fear that incorporated methods such as the behavioural experiment they completed during the study. However, the generalizability of this finding is limited by the use of a non-treatment seeking, nonclinical sample, and by a brief single-session intervention. Future research on safety behaviour and treatment acceptability is thus necessary. Study 2 was developed in an effort to contribute to this nascent area in the safety behaviour literature. In this investigation, nonclinical and clinically anxious participants rated a series of vignettes describing a course of exposure-based treatment and provided ratings of treatment acceptability and adherence, as well as preference ranks. Treatment descriptions varied as a function of safety behaviour use (judicious vs. discouraged) and treatment rationale (cognitive vs. extinction).

CHAPTER 4

Incorporating the Judicious Use of Safety Behaviour into Exposure-Based Treatments for Anxiety Disorders: A Study of Treatment Acceptability

Exposure therapy, whether delivered alone or in combination with cognitively-based techniques, has received substantial empirical support (Butler, Chapman, Forman, & Beck, 2006; Norton & Price, 2007; Olatunji, Cisler, & Deacon, 2010), and it is the psychosocial treatment of choice for anxious psychopathology (Chambless et al., 1998; Chambless & Ollendick, 2001). This treatment method aims to facilitate declines in the fear response and to promote corrective learning by requiring patients to engage in repeated and prolonged exposure to situations, sensations, and/or thoughts and images that elicit fear or anxiety (Barlow, 2002; Craske, 1999).

Despite the well-established efficacy of exposure-based treatments for anxiety disorders, not all patients benefit from exposure and a considerable number refuse treatment or drop out before treatment has been completed. Both a fear of confronting anxiety-provoking situations and an intolerance of distress have been identified as important factors in treatment acceptability (Emmelkamp & van den Hout, 1983; Maltby & Tolin, 2003, 2005). Rates of refusal and dropout for exposure-based treatment range between 20% to 30% for obsessive-compulsive disorder (Foa et al., 2005; Franklin & Foa, 1998; Stanley & Turner, 1995; Whittal, Thordarson, & McLean, 2005), 14% to 20% for post-traumatic stress disorder (Hembree et al., 2003; Van Etten & Taylor, 1998), 7% to 31% for panic disorder (Cox, Endler, Lee, & Swinson, 1992), 0% to 45% for specific phobias (Choy et al., 2007), and 0% to 27% for social phobia (Feske & Chambless, 1995).

Clinical researchers have investigated various methods of augmenting or modifying exposure-based treatments to improve their acceptability (e.g., Deacon et al., 2010; Feeny, Zoellner, & Kahana, 2009; Maltby & Tolin, 2005). One promising avenue has focused on safety behaviour—idiosyncratic overt or covert actions used by anxious individuals to prevent feared catastrophe (Salkovskis, 1991). There is abundant empirical support for the counter-therapeutic effects of safety behaviour in exposure-based treatments (e.g., Powers et al., 2004; Salkovskis et al., 1999; Sloan & Telch, 2002; Taylor & Alden, 2010). Specifically, this data supports the perspective that elimination of safety behaviour reduces the possibility that patients will misattribute the non-occurrence of catastrophic outcomes during exposure to their reliance on such behaviour (Salkovskis, 1991).

However, emerging research suggests that allowing patients to use safety behaviour in the early stages of exposure therapy might facilitate the therapy without reducing its effectiveness. Rachman and colleagues (2008) proposed that safety behaviour does not necessarily detract from the benefits of exposure, specifying that the *judicious* incorporation of safety behaviour into exposure-based treatments (e.g., in the early stages of treatment with subsequent fading) has the potential instead to promote treatment gains. A number of recent studies have demonstrated that the inclusion of safety behaviour during exposure sessions results in both fear reduction and cognitive change comparable to those seen after traditional exposures in which safety behaviour is discouraged or eliminated (Deacon et al., 2010; Hood et al., 2010; Milosevic & Radomsky, 2008; Rachman et al., 2011; Sy et al., 2011; van den Hout et al., 2011; for reviews of earlier work see Parrish et al., 2008, and Rachman et al., 2008).

Rachman et al. (2008) emphasized that improvements in treatment acceptability and tolerability are a key possible advantage of judicious safety behaviour use. They posited that allowing patients to rely on safety strategies during the early and most demanding stages of treatment will increase their sense of control, enhance their confidence, and elicit their cooperation. Accordingly, they hypothesized that therapy in which safety behaviour is presented in this manner will be significantly more acceptable to patients, with fewer refusers and dropouts.

Few studies have evaluated the impact of judicious safety behaviour use on treatment acceptability. In the most direct test of Rachman et al.'s (2008) hypothesis, Deacon et al. (2010) examined the effect of safety aids on treatment efficacy and acceptability in a sample of undergraduate students with high claustrophobic fear. Participants were randomized to conditions that either provided or did not provide access to safety aids (e.g., opening a small door for fresh air) during the first four of six brief exposure trials in a "claustrophobia chamber". Treatment acceptability, aversiveness, and the desire to stop treatment were assessed after each trial. Robust and comparable improvements in claustrophobic fear and cognitions were observed for both groups, and there were no between-group differences in terms of treatment perceptions. This study demonstrated that safety aids can be incorporated into exposure-based treatment without compromising its efficacy; however, its test of the hypothesized benefits of judicious safety behaviour use for increasing the acceptability and tolerability of early exposure trials was limited. Given a non-treatment-seeking sample and the short duration of the exposure trials (a maximum of 5 minutes each), problems with compliance and attrition were unlikely to have occurred in the context of this protocol.

In a study examining the effects of snake fearful participants' use of protective safety gear during a 45-minute exposure session with a live snake, Milosevic and Radomsky (2008) found that, compared to participants who did not use safety gear, participants who used the gear benefited from a greater increase in their approach to the snake during the first 15 minutes of the session. Both groups attained comparable post-session outcomes in terms of fear reduction, approach behaviour, and cognitive change. Although treatment acceptability was not directly measured, these findings suggest that safety gear enabled participants to tolerate being in closer proximity to the fear stimulus in the early part of treatment.

In a replication and extension of this work, Hood et al. (2010) examined the effects of safety behaviour use on subjective, behavioural, and cognitive indices of fear in a sample of spider fearful participants during a two-stage 35-minute paradigm involving exposure to a live spider. Participants assigned to a safety behaviour use condition benefited from gains on these measures post-treatment and at a one-week follow up, which were comparable to the gains of those who were asked to refrain from using safety behaviour. Hood et al. observed that participants who were encouraged to use safety behaviour endorsed lower initial subjective distress during their first exposure to the spider, which suggests, as in the work of Milosevic and Radomsky (2008), that safety behaviour increased the tolerability of the early stages of exposure without impairing overall treatment outcome. Additional research is needed to establish to what extent use of safety behaviour in initial stages of exposure treatment reduces high levels of distress and whether this impacts treatment refusal and/or dropout.

In Study 1, treatment acceptability was evaluated as a function of spider fearful participants' safety gear use during a 20-minute session with a live spider in which they tested the validity of their threat beliefs. Following the session, participants were asked how acceptable they would find a full course of treatment that incorporated elements such as the exposure-based task they had just completed. Whereas there were no group differences in treatment endorsement, a marginal difference in anticipated discomfort was observed, with participants who had not used safety gear indicating greater anticipated discomfort than those in the safety gear condition. This finding highlights the potential for safety behaviour to reduce possible discomfort or apprehension about initiating exposure treatment. However, as in previous work, follow-up investigations under more representative clinical conditions are necessary to establish the role of judicious safety behaviour in treatment acceptability.

Given the nascent literature on the effects of judicious safety behaviour on the acceptability of exposure-based treatments, the present study was designed to further understand the role of safety behaviour in treatment acceptability. Specifically, I evaluated undergraduate students' and clinically anxious participants' perceptions of a standard exposure treatment protocol (i.e., one that encourages elimination of safety behaviour) and an exposure protocol incorporating the judicious use of safety behaviour. An analogue design using written vignettes allowed for the description of treatments that are representative of current clinical practice. The description of procedures involved in the course of treatment is an important consideration as experimental studies to date have relied on brief single-session paradigms, the acceptability of which might not be generalizable to the full scope of treatment.

Although the primary research question centered on safety behaviour, treatment rationale was also varied across descriptions to eliminate a confound common to earlier studies in this domain, whereby conditions in which safety behaviour was reduced included a cognitive rationale and those in which it was retained included an extinction rationale (e.g., McManus et al., 2008; Salkovskis et al., 1999; Sloan & Telch, 2002, Wells et al., 1995). As there is some evidence that the reduction of safety behaviour under a cognitive rationale produces better treatment outcomes than its reduction under an extinction rationale (Kim, 2005) and that cognitive therapy is ranked more favourably than cognitive therapy with exposure (Tarrier et al., 2006)[3], it was essential to account for treatment rationale in the current study. This was accomplished with a 2 (judicious vs. discouraged safety behaviour) x 2 (cognitive vs. extinction rationale) design. It was hypothesized that treatment descriptions that promote the judicious use of safety behaviour under a cognitive rationale would be deemed most acceptable, followed, in turn, by judicious safety behaviour use under an extinction rationale, discouraged safety behaviour use under a cognitive rationale, and discouraged safety behaviour use under an extinction rationale.

Method

Participants

Student sample. Undergraduate participants were Concordia University students, who were recruited through classroom announcements and posters placed around the campus. For their participation, participants received either extra credit in a psychology course or an entry into a draw for cash prizes. A total of 467 students completed the study. As I was interested in recruiting a sample naïve to cognitive-behavioural therapy

(CBT) and exposure therapy, several questions pertaining to past and current psychological treatment were included among the measures administered in the study. Individuals who indicated that they had previously received or are currently receiving CBT or exposure therapy (n = 30) were excluded from analyses. Excluded participants did not differ significantly from the included group in terms of sex, level of education, ethnic background, treatment seeking status, and scores on the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996). They were, however, significantly older and more likely to report that they had a current psychiatric disorder, and they had greater scores on the Symptom Checklist-90-R (SCL-90-R; Derogatis 1977, 1994) and on the Beck Anxiety Inventory (BAI; Beck et al., 1988).

The final sample included 437 student participants who had never received CBT. Their mean age was 22.46 (SD = 4.30, range 18-59) years. The majority (82.20%) were women , and they reported a mean of 2.55 (SD = 1.71) years of university education. Most identified their ethnic background as being of European descent (74.37%), with the rest identifying as East Asian (5.95%), Middle Eastern (5.95%), African Canadian/American (4.12%), South Asian (3.43%), multi-ethnic (2.97%), Hispanic (2.30%) and other (.92%). Their scores on the SCL-90-R (Derogatis, 1977, 1994), BAI (Beck et al., 1988), and BDI-II (Beck et al., 1996) were representative of a nonclinical sample (see Table 4.1 for means). Few participants (1.80%) reported that they were currently receiving or seeking treatment for a psychiatric disorder (3.40%; current treatment did not include CBT or exposure). With regard to anxiety disorders, 8.20% of participants reported a past diagnosis and 2.10% reported a current diagnosis. Of those

Table 4.1

Participant Characteristics

	Sample	
Variable	Nonclinical (*N* = 437)	Clinical (*N* = 32)
Female *n* (%)	359 (82.20)	20 (62.50)
Age *M* (*SD*)	22.46 (4.30)	33.69 (12.77)
Years in university *M (SD)*	2.55 (1.71)	3.22 (3.28)
SCL-90-R: GSI *M (SD)*	.49 (.50)	1.43 (.89)
BAI *M* (*SD*)	8.27 (8.75)	22.91 (15.53)
BDI-II *M* (*SD*)	8.67 (8.45)	20.38 (13.08)

Note. Nonclinical participants were undergraduate students. Clinical participants had a principal diagnosis of an anxiety disorder. SCL-90-R: GSI = Symptom Checklist-90-Revised: General Severity Index; BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory-II.

with a current anxiety disorder diagnosis, 22.22% (n = 2) reported that they were seeking treatment for the disorder.

Clinical sample. Clinical participants were recruited via notices posted at Concordia University and in the surrounding community and through newspaper and internet classified ads seeking individuals who are currently experiencing difficulties with anxiety. Interested individuals completed a telephone screen, during which they were asked standardized questions about symptoms of anxiety and psychosis based on criteria from the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 2000). They were also asked about their treatment history. Those who endorsed symptoms of an anxiety disorder and who denied both symptoms of psychosis and previous or current treatment involving CBT or exposure therapy were invited to the laboratory for a clinical diagnostic interview (see below). Out of 41 individuals who were interviewed, 40 met criteria for an anxiety disorder and completed the study. Surprisingly, preliminary analyses of data from a treatment history questionnaire indicated that despite their responses during the telephone screen, eight participants reported that they had indeed received CBT or exposure therapy for anxiety. To ensure a treatment-naïve sample, these participants were excluded from subsequent analyses. Excluded participants did not differ significantly from the included group in terms of age, level of education, ethnic background, treatment-seeking status, and scores on the SCL-90-R (Derogatis, 1977, 1994), BAI (Beck et al., 1988), and BDI-II (Beck et al., 1996). However, they were more likely to be female than participants in the final sample.

All subsequent analyses were conducted with 32 participants who had never received CBT. These participants ranged in age from 18 to 64 (M = 33.69, SD = 12.77) years and 62.50% were women. They reported a mean of 3.22 (SD = 3.28) years of university education. The majority identified their ethnic background as being of European descent (62.50%), with the rest identifying as multi-ethnic (15.63%), East Asian (9.38%), as well as South Asian, Hispanic, Middle Eastern, and other (3.13% each). Their scores on the SCL-90-R (Derogatis 1977, 1994), BAI (Beck, Epstein, Brown, & Steer, 1988), and BDI-II (Beck, Steer, & Brown, 1996) were representative of a clinical sample (see Table 4.1 for means).

All participants in this sample had a principal diagnosis of an anxiety disorder, with Social Anxiety Disorder and Obsessive-Compulsive Disorder being the most common principal diagnoses (28.57% each), followed by Specific Phobia (17.14%), Panic Disorder with or without Agoraphobia (14.28%), and Generalized Anxiety Disorder (11.43%). Approximately half (56%) of participants had at least one comorbid diagnosis (mean number of comorbidities = 1.72). The most commonly occurring comorbidities were Specific Phobia (28%), Obsessive-Compulsive Disorder (18%), Panic Disorder with or without Agoraphobia (14%), and Dysthymic Disorder (14%).

To ensure diagnostic reliability, a subset (22%) of audio recordings of the diagnostic interviews was listened to by an independent rater, who generated diagnoses based on each interview. Inter-rater reliability across both principal and additional diagnoses was excellent (k = .94). Disagreement between raters regarding two diagnoses was resolved through a review of the recordings and discussion. The mean numbers of anxiety disorder diagnoses and overall diagnoses per participant were 1.61 (SD = .67) and

1.90 (*SD* = .91), respectively. A considerable minority of participants (40.60%) indicated that they are currently seeking treatment for their principal disorder, and 12.50% of participants reported that they are currently receiving treatment (not CBT or exposure) for their disorder(s).

Measures

Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV). The ADIS-IV (Di Nardo et al., 1994) is a semi-structured standardized clinical interview schedule that assesses current anxiety, mood, substance use, and somatoform disorders consistent with DSM-IV criteria. The ADIS-IV is widely used in both clinical and research settings. It has demonstrated less than adequate to excellent inter-rater reliability (k = .68 to .99), depending on the point of assessment (Tsao, Lewin, & Craske, 1998), and it has been shown to have good test-retest reliability (Di Nardo, Moras, Barlow, Rapee, & Brown, 1993). It was administered to non-student participants to establish their diagnostic status and symptom severity.

Endorsement and Discomfort Scale. This 10-item self-report scale was developed by Tarrier et al. (2006) for research on treatment preference and acceptability. Respondents are asked indicate their level of agreement, along a 9-point Likert scale, with statements about a treatment's acceptability, suitability, tolerability, likelihood of creating positive benefit, credibility, efficacy, appropriateness, reasonableness, justifiability, and discomfort. Tarrier et al. found that the first nine dimensions loaded onto a factor that they conceptualized as treatment endorsement. The second component, which included the remaining item, was labelled as treatment discomfort. In the current study, this measure was administered to evaluate the overall acceptability of each of four

treatment descriptions. The endorsement scale demonstrated excellent internal consistency across the four administrations to both the student (mean $\alpha = .96$) and clinical (mean $\alpha = .98$) samples.

Treatment Adherence Scale. A self-report scale comprised of 10 questions focused on adherence, drop-out, and distress was developed specifically for this study to evaluate additional elements of treatment acceptability (Milosevic & Radomsky, 2009). Items on this measure were based on previous research on credibility, expectancy, and distress in clinical outcome studies (Devilly, 2004; Devilly & Borcovec, 2000). The Treatment Adherence Scale demonstrated good internal consistency in both student (mean $\alpha = .84$) and clinical (mean $\alpha = .88$) samples across four administrations. Total scores on this measure were found to be significantly correlated with total endorsement scores on the Endorsement and Discomfort Scale (Terrier et al., 2006) for both students (mean $r = .73$) and clinically anxious participants (mean $r = .84$), all ps $< .001$ across four administrations.

Treatment Preference Form. This form was developed for the current study to assess participants' preferences for the treatments described in the vignettes. Participants were asked to rank the four treatment options in order of preference for the one that they would most be interested in receiving for an anxiety problem.[4]

Treatment Background Questionnaire. This measure was developed for the current study to assess participants' psychiatric history, as well as their history of psychological and psychiatric interventions. Items assessed lifetime diagnosis of an anxiety disorder and type of treatment received for the disorder, as well as current

diagnosis of any psychiatric disorder and type of treatment received for the disorder. Participants were additionally asked if they were seeking treatment for current problems.

Beck Anxiety Inventory (BAI) and Beck Depression Inventory-II (BDI-II). The BAI (Beck et al., 1988) and BDI-II (Beck et al., 1996) are standardized and commonly used 21-item self-report measures assessing state anxiety and depressive symptoms, respectively. The BAI has been shown to have excellent internal consistency (α = .92) and strong convergent and discriminant validity in an outpatient sample (Beck et al., 1988). In the current study, it demonstrated excellent internal consistency in both nonclinical (α = .92) and clinical (α = .95) samples. The BDI-II has similarly been shown to have excellent internal consistency, with coefficient alphas of .92 in a sample of outpatients and .93 in college students (Beck et al., 1996). Alphas in the current study were of similar magnitude (nonclinical sample, α = .92; clinical sample, α = .93). This measure has also demonstrated convergent and discriminant validity (Beck et al., 1996; Steer & Clark, 1997).

Symptom Checklist-90-R (SCL-90-R). The SCL-90-R (Derogatis 1977, 1994) is a widely used measure of mental status. This 90-item self-report instrument is intended to evaluate the presence of a broad range of current psychological problems and the intensity of their symptoms. The SCL-90-R assesses nine symptom dimensions and also includes three global indices, including a global index of psychological distress (Global Severity Index). Acceptable to excellent internal consistency has been reported for the symptom dimensions (αs = .77 - .90; Derogatis, Rickels, & Rock, 1976). In the current study, the Global Severity Index demonstrated excellent internal consistency in both the nonclinical and clinical samples (α for both groups = .98). Test-retest reliability

coefficients for the SCL-90-R have been shown range from .68 to .83 during a 10-week interval (Derogatis, 1994). Due to inconsistent findings regarding the divergent validity of its subscales (Vassend & Skrondal, 1999), the SCL-90-R might best be used as measure of general distress, which was the purpose of its inclusion in this study.

Treatment Descriptions

A series of vignettes was developed for the current study, consisting of a description of the purpose of the study (see Appendix E), a general description of treatments incorporating exposure exercises (see Appendix F), and four detailed descriptions of variants of such treatments (see Appendix G). The purpose of the study emphasized that the researchers are examining an intervention aimed at a broad range of anxiety disorders, and it asked participants to engage with the protocol by imagining how they might respond if they were potential candidates for this treatment (i.e., if they had an anxiety problem that needed treating). Clinically anxious participants additionally received verbal instructions to keep their principal anxiety disorder in mind while proceeding through the study.

The general description of exposure treatment instructed participants to imagine that they have been referred to receive this treatment for an enduring problem with fear or anxiety that has been causing them distress and that has interfered with their daily activities. An overview of the treatment methods and principles was provided, and participants were informed that they would have a choice among several possible variations of more specific therapy procedures (which were described in individual treatment vignettes).

The four treatment vignettes varied in their description of safety behaviour (judicious use vs. discouraged use) and rationale (extinction vs. cognitive), with the descriptions combining to form the following distinct variations: 1.) judicious use of safety behaviour with an extinction rationale, 2.) discouraged use of safety behaviour with an extinction rationale, 3.) judicious use of safety behaviour with a cognitive rationale, and 4.) discouraged use of safety behaviour with a cognitive rationale. The order of the vignettes was counterbalanced across participants using a Latin square design.

The judicious use of safety behaviour was presented as a set of strategies selected collaboratively by the patient and therapist that might make the patient feel safer or less anxious if s/he encounters an obstacle in the early stages of exposure therapy. Participants were also informed that once they have advanced to later stages of treatment, they would work with the therapist to phase out these strategies. The description of discouraged safety behaviour use emphasized that the therapist would discourage patients from using strategies that they normally rely on to feel safer or less anxious, as it has been proposed that the use of such strategies during exposure therapy might interfere with long-term fear reduction. The extinction treatment rationale emphasized the need to remain in anxiety-provoking situations long enough for one's anxiety to begin to decrease, whereas the cognitive rationale focused on the acquisition of information necessary to change negative and irrational beliefs.

Procedures

Student participants completed the study online after contacting the principal investigator via email or telephone to obtain the web address for the study portal. Once

they logged into the portal, they were required to complete the study in a single session, which was approximately one hour long. Clinical participants who met eligibility criteria via the telephone screen were invited to attend an individual test session in the laboratory. There, they were administered the ADIS-IV (Di Nardo et al., 1994), and if they were determined to have a principal diagnosis of an anxiety disorder, they were invited to continue on to the second part of the study, which involved completing the same online forms as the student participants on a laboratory computer.

During the online session, participants first read the purpose of the study, followed by a general descripton of exposure-based treatments. All four treatment vignettes were then presented to all participants in one of four possible orders. Each vignette was followed by the administration of the Endorsement and Discomfort Scale (Tarrier et al., 2006) and the Treatment Adherence Scale (Milosevic & Radomsky, 2009). After reading the vignettes and completing the corresponding measures, participants indicated their treatment preference ranks in the Treatment Preference Form. They then completed a battery of measures, including a demographics survey, the Treatment Background Form, BAI, BDI-II, and SCL-90-R.

Results

Effects of Treatment Seeking Status

As it could be argued that responses regarding treatment acceptability and preference might differ between treatment seekers and non-seekers, I examined whether treatment-seeking status had an impact on treatment perception and preference. A series of one-way analyses of variance (ANOVAs) were conducted for each of three acceptability measures across the four vignettes for the clinical sample. This analysis was

not conducted in the student sample, as only two of 437 participants indicated that they were currently seeking treatment for an anxiety disorder. There were no significant differences in ratings of treatment acceptability (all *F*s < 3.02, *n.s.*). A Wilcoxon rank sum test was conducted to evaluate differences between treatment seekers and non-seekers in terms of treatment preference ranks for clinically anxious participants. No significant differences were observed for the ranks of any of the four treatments (all *z*s < -.62, *n.s.*).

Treatment Acceptability

Treatment acceptability was evaluated with 2 X 2 within-participant (safety behaviour vs. rationale) repeated measures ANOVAs, which were conducted on measures of endorsement, discomfort, and adherence. In the student sample, main effects were observed for safety behaviour for all three acceptability measures: endorsement, $F(1, 436) = 181.30$, $p < .001$, partial $\eta^2 = .29$, discomfort, $F(1, 436) = 158.18$, $p < .001$, partial $\eta^2 = .27$, and adherence, $F(1, 436) = 239.48$, $p < .001$, partial $\eta^2 = .36$. Compared to treatment descriptions of discouraged safety behaviour use, descriptions of judicious safety behaviour use received significantly greater endorsement and adherence ratings and significantly lower ratings of anticipated discomfort. Main effects were additionally observed for treatment rationale for the three acceptability measures: endorsement, $F(1, 436) = 32.81$, $p < .001$, partial $\eta^2 = .07$, discomfort, $F(1, 436) = 142.33$, $p < .001$, partial $\eta^2 = .25$, and adherence, $F(1, 436) = 104.05$, $p < .001$, partial $\eta^2 = .19$. Treatment descriptions that presented a cognitive rationale were significantly more strongly endorsed than those that presented an extinction rationale, and they received significantly

greater adherence ratings and lower ratings of anticipated discomfort (see Table 4.2 for means). No significant interactions were observed, all *F*s < 2.74, *n.s.*

Parallel to the findings from student participants, results from the clinical sample revealed significant main effects of safety behaviour for all three acceptability measures, including endorsement, $F(1, 31) = 12.48$, $p < .01$, partial $\eta^2 = .29$, discomfort, $F(1, 31) = 10.41$, $p < .01$, partial $\eta^2 = .25$, and adherence, $F(1, 31) = 16.53$, $p < .001$, partial $\eta^2 = .35$. Treatments promoting judicious use of safety behaviour received significantly greater ratings of endorsement and adherence and significantly lower ratings of anticipated discomfort than those discouraging its use. In terms of treatment rationale, a trend was observed for adherence, $F(1, 31) = 2.98$, $p = .10$, partial $\eta^2 = .09$, with treatments that presented a cognitive rationale being rated as more easy to adhere to than those that presented an extinction rationale. No main effects of treatment rationale were observed for endorsement and discomfort, *F*s < 1.49, *n.s.* However, an examination of the means (see Table 4.2) suggests a pattern similar to that of the student sample, with treatments based on a cognitive rationale receiving higher mean scores of endorsement and lower mean discomfort scores than those based on an extinction rationale. As in the student sample, no significant safety behaviour by rationale interactions were observed, all *F*s < .30, *n.s.*

Treatment Preference Ranks

Friedman's nonparametric test was conducted to assess possible differences in participants' preference ranks of the four treatment descriptions. The results demonstrated that there was a significant difference in the way that the treatments were ranked, $\chi^2(3, N = 437) = 428.16$, $p < .001$. This finding was followed up with Wilcoxon

Table 4.2

Mean Ratings of Treatment Endorsement, Adherence, and Discomfort by Nonclinical and Clinically Anxious Participants

	Nonclinical Sample ($N = 437$)			Clinical Sample ($N = 32$)		
	Endorsement	Adherence	Discomfort	Endorsement	Adherence	Discomfort
Treatment Description	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
SB-COG	61.61 (13.84)	62.74 (10.35)	4.28 (2.39)	59.44 (19.37)	58.59 (11.87)	5.25 (2.72)
SB-EXT	57.96 (16.41)	57.97 (12.28)	5.59 (2.53)	57.38 (15.20)	55.38 (11.62)	5.63 (2.61)
NO-SB-COG	51.48 (16.96)	54.68 (11.74)	5.66 (2.56)	50.50 (21.88)	52.47 (13.71)	6.44 (2.63)
NO-SB-EXT	47.56 (18.89)	49.30 (12.72)	6.68 (2.36)	47.53 (22.37)	48.72 (14.32)	7.00 (2.40)

Note. Nonclinical participants were undergraduate students. Clinical participants had a principal diagnosis of an anxiety disorder. SB-COG = Judicious Safety Behaviour/Cognitive Rationale; SB-EXT = Judicious Safety Behaviour/Extinction Rationale; NO-SB-COG = Discouraged Safety Behaviour/Cognitive Rationale; NO-SB-EXT = Discouraged Safety Behaviour/Extinction Rationale.

tests to examine differences between each of six pairs of treatment variations. All pairs of treatment ranks were shown to differ significantly from one another (a Bonferroni correction was applied with the significance threshold set at .008). The most highly ranked treatment description endorsed judicious safety behaviour use and presented a cognitive rationale. The treatment description with the lowest preference rank discouraged the use of safety behaviour and presented an extinction rationale (see Figure 4.1).

Analyses of clinical participants' treatment ranks produced similar results. Friedman's nonparametric test revealed a significant difference in the way that the treatment descriptions were ranked, $\chi^2(3, N = 32) = 17.98$, $p < .001$, and follow-up analyses indicated that the treatment description that endorsed judicious safety behaviour use and presented a cognitive rationale was ranked significantly more highly than the one that discouraged the use of safety behaviour and presented an extinction rationale ($p < .008$). Furthermore, in the context of the extinction rationale, participants provided a higher rank for the treatment that endorsed judicious use of safety behaviour than the one that discouraged it ($p < .008$).[5]

Discussion

This analogue study tested the hypothesis that the judicious incorporation of safety behaviour into exposure-based treatments for anxiety disorders would result in greater treatment acceptability. Participants rated four vignettes describing exposure therapy that varied as a function of safety behaviour use and treatment rationale. In support of my hypotheses, treatment descriptions promoting the judicious use of safety behaviour received higher ratings of acceptability, based on measures of endorsement,

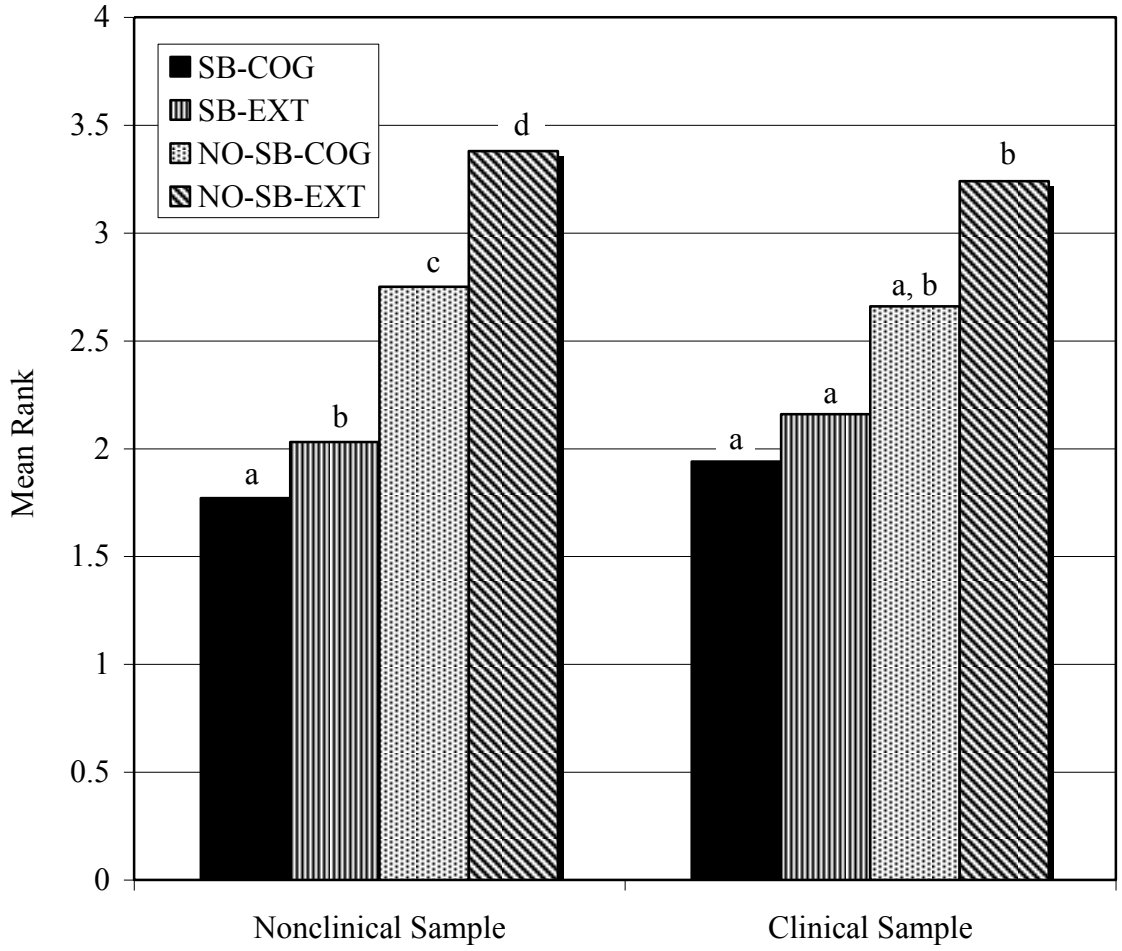

Figure 4.1. Mean preference rank for four treatment descriptions. Lower numbers for mean rank represent greater treatment preference. Within each participant group, unshared letters indicate differing means, $p < .008$. Nonclinical participants were undergraduate students. Clinical participants had a principal diagnosis of an anxiety disorder. SB-COG = Judicious Safety Behaviour/Cognitive Rationale; SB-EXT = Judicious Safety Behaviour/Extinction Rationale; NO-SB-COG = Discouraged Safety Behaviour/ Cognitive Rationale; NO-SB-EXT = Discouraged Safety Behaviour/ Extinction Rationale.

adherence and discomfort, compared to those discouraging the use of safety behaviour. A cognitive rationale was endorsed as being more acceptable than an extinction rationale based on the same ratings. Furthermore, treatment involving judicious safety behaviour use that also presented a cognitive rationale received the highest mean preference rank. A nonclinical sample of student participants and a sample of participants with a diagnosed anxiety disorder, both who were asked to imagine that they were seeking treatment for difficulties with anxiety, provided comparable acceptability ratings and preference ranks.

These preliminary findings are consistent with Rachman and colleagues' (2008) position that judicious safety behaviour use has the potential to facilitate exposure-based treatments by making the early stages of therapy more acceptable and tolerable. The results suggest that during early exposure sessions, use of safety behaviour might decrease discomfort and increase adherence. Recent findings from work examining within- and between-session fear activation and habituation highlight the importance of anxiety reduction in the initial exposure session. Observing these processes in trials of transdiagnostic group CBT for anxiety disorders, Norton, Hayes-Skelton, and Klenck (2011) found that participants who experienced increases or less positive decreases in subjective anxiety during the first exposure session were significantly more likely to drop out. The authors suggest that such failure to habituate might result in patients' perceptions that treatment is unsuccessful and their anxiety unchanging, leading to their discontinuation of treatment. They recommend that "in the first exposure session specific care should be taken to ensure that the client experiences a reduction in their anxiety" (p. 660). One method of achieving this goal might be the judicious use of safety behaviour. For instance, the work of Hood et al. (2010) demonstrated that safety behaviour use

during a 5-minute exposure task decreased subjective distress without impairing subsequent treatment outcomes.

The current study also demonstrated that exposure-based treatments providing a cognitive treatment rationale were viewed more favourably than those that provide an extinction rationale, which is consistent with previous work (Tarrier et al., 2006). Importantly, the result revealed differences in preference for and acceptability of safety behaviour use under differing rationales. As a number of studies evaluating the effects of safety behaviour during exposure-based treatments have compared conditions of retained safety behaviour under an extinction rationale with conditions of discouraged safety behaviour under a cognitive rationale (e.g., McManus et al., 2008; Salkovskis et al., 1999; Sloan & Telch, 2002, Wells et al., 1995), it is possible that treatment outcomes favouring discouraged safety behaviour use under a cognitive rationale were attributable, in part, to the presentation of different rationales. Although a cognitive rationale for the elimination of safety behaviour from exposure therapy is consistent with cognitive-behavioural models of anxiety disorders (Salkovskis, 1991), it is worth considering the judicious use of safety behaviour as a therapeutic tool that might facilitate cognitive reappraisal. Indeed, in Study 1, the pairing of encouraged use of safety gear with instructions for cognitive reappraisal facilitated cognitive change and fear reduction.

One strength of the current study is the inclusion of clinically anxious participants for whom the possibility of receiving exposure-based treatment is most likely. A considerable minority of this sample was comprised of treatment seekers, although treatment-seeking status had no bearing on acceptability ratings and preference ranks.

Thus, it appears that responses on these measures are generally representative of individuals with anxiety disorders irrespective of their interest in obtaining treatment.

As most participants in this study were undergraduate students, it is possible that clinically-relevant data from this population might be poor to generalize to clinical samples. The results, however, do not suggest poor generalizability in terms of treatment perceptions. Nonclinical participants produced a similar pattern of responses compared to clinically anxious participants in terms of the relative acceptability of and preference for the four treatments. The two samples differed, however, in terms of their strength of acceptability ratings for treatments incorporating judicious safety behaviour and in terms of preference ranks for the treatment involving discouraged safety behaviour under an extinction rationale. Individuals with anxiety disorders tended to endorse a less positive view of these treatments than student participants, although the size of this difference was very small. This finding is unsurprising, as treatment in which one is being exposed to a feared stimulus is likely to be perceived as more threatening by individuals who have higher levels of fear or anxiety.

Whereas these results tell us what participants think about written descriptions of judicious safety behaviour use in exposure-based treatments, it is not known whether their responses would generalize to actual treatment experiences. It is likely that patients' treatment perceptions and related behaviour (e.g., adherence, drop-out) in a therapeutic context are moderated by additional variables, such as therapeutic rapport and early therapy gains. It is also possible that rapport might partially mediate the relationship between exposure-based work and adherence or dropout. This is relevant to the current study, as a therapist who discourages safety behaviour in the early stages of treatment

might be perceived as being less kind or supportive compared to one who promotes it, thus impacting ratings of acceptability. I ensured that the description of discouraged safety behaviour included a clear rationale for its exclusion (i.e., it has been shown to interfere with long-term fear reduction) in an effort to limit assumptions that this is done arbitrarily or from a lack of kindness; however, the current research design did not allow me to control for the effects of perceived therapeutic rapport. Future research is necessary to test the generalizability of my findings to a clinical context and to understand how additional factors in therapy interact with instructions surrounding safety behaviour utilization during exposure.

Although there are clear limitations to analogue research, the format of this study allowed for the depiction of full course of treatment with detailed descriptions of its methods, whereas experimental studies of treatment acceptability have thus far been limited by brief and/or one-time exposures to a feared stimulus. By contrast to previous research on safety behaviour, the current study focused primarily on treatment acceptability and preference. Accordingly, an additional strength of this work is the inclusion of more comprehensive measures of these constructs. I nevertheless struggled to find appropriate measures and resorted, in part, to developing my own. Future work will benefit from the development and/or administration of treatment acceptability measures with both well-established and respectable psychometric properties.

This study contributes to an emerging literature on the possible benefits of judicious safety behaviour use in the context of exposure-based treatments for anxiety disorders and to a broader literature focused on exploring methods to improve the acceptability of this treatment technique. The results, in combination with evidence for

the facilitative effects of judicious safety behaviour use, offer promise for reducing the unacceptably high rates of refusal and dropout from exposure-based treatments.

CHAPTER 5

Study 2 investigated treatment acceptability and preference as a function of safety behaviour use and treatment rationale. Clinically anxious participants and undergraduate student participants provided ratings of acceptability for four written vignettes describing a course of CBT for difficulties with fear or anxiety. They also provided preference ranks for the described treatments. The analogue design of this study allowed for the assessment of acceptability based on a detailed description of a course of exposure-based treatment. This design offers a possible advantage over experimental studies to date, as the acceptability of their brief single-session exposure paradigms might not readily generalize to a full treatment protocol. Furthermore, this work offers a novel contribution to the safety behaviour literature through its express examination of treatment perceptions, which have not been well investigated in this domain.

The results demonstrated that descriptions promoting the judicious use of safety behaviour received significantly higher ratings of acceptability compared to those discouraging its use. Descriptions that presented a cognitively-based rationale, compared to an extinction-based rationale, were also rated as being significantly more acceptable. The highest preference rank was for treatment that included judicious safety behaviour use and that was conveyed via a cognitive rationale. The same general pattern of results was produced by both participant groups.

Combined, the results of Studies 1 and 2 suggest that use of safety behaviour during exposure-based treatments for anxiety disorders need not be detrimental, and that its judicious incorporation into such treatments has the potential to reduce treatment refusal and dropout. These findings contribute to a growing literature suggesting that

safety behaviour does not necessarily hinder treatment outcomes, and they draw attention to the need for further investigation to clarify under what circumstances safety behaviour is beneficial and detrimental to anxiety and fear reduction.

As highlighted by Thwaites and Freeston (2005), it can be very challenging to make a distinction between maladaptive safety behaviour and adaptive coping strategies. Theoretically and psychometrically sound assessment tools are necessary to further our understanding in this domain, and the literature is currently bereft of them. Study 3 thus aimed to develop and evaluate a novel self-report measure of strategies used in anxiety provoking-situations in order to address the limitations of existing instruments. To determine the factor structure of this measure, exploratory and confirmatory factor analyses were conducted with data from a nonclinical sample. Analyses of reliability and validity were conducted with data from both nonclinical and clinically anxious participants.

CHAPTER 6

The Safety Behaviour Inventory: Development and Psychometric Evaluation

Anxious individuals' strategies to avoid or avert perceived negative outcomes in feared situations are posited to have a significant role in the maintenance of their anxiety. According to cognitive-behavioural models of anxiety disorders, such strategies, termed safety behaviour, interfere with disconfirmatory experiences (i.e., learning that feared outcomes are unlikely to occur) and can result in the misattribution of safety to one's reliance on the behaviour (Clark, 1999; Salkovskis, 1991). Consistent with these hypotheses, there is substantial empirical support for the detrimental effects of safety behaviour on fear reduction and cognitive change during cognitive-behavioural treatments (e.g., Kim, 2005; McManus et al., 2008; Powers et al., 2004; Salkovskis et al., 1999; Sloan & Telch, 2002; Taylor & Alden, 2010; Wells et al., 1995).

In contrast to these findings, recent work has emphasized that the judicious incorporation of safety behaviour into exposure-based treatments for anxiety disorders has the potential to facilitate therapeutic progress (Rachman et al., 2008). Preliminary evidence supports this hypothesis, with several studies demonstrating that participants who used safety strategies during exposure sessions experienced gains (i.e., fear reduction and/or cognitive change) that were equal to or greater than those who did not use them (e.g., Deacon et al., 2010; Hood et al., 2010; Milosevic & Radomsky, 2008; Rachman et al., 2011; Sy et al., 2011; van den Hout et al., 2011). Earlier work on escape behaviour (de Silva & Rachman, 1984; Rachman et al., 1986) and safety aids (Bandura et al., 1974) has produced similar results.

There is no consensus on the factors that contribute to the divergence of findings in the safety behaviour literature, with suggestions focusing on differences in types of safety strategies (e.g., distraction versus other safety behaviours, Hood et al., 2010) and the intent for their use (e.g., mere presence of safety behaviour versus individuals' perceptions of the function and/or meaning of the behaviours; Sy et al., 2011), the treatment paradigm (e.g., access of safety aids throughout duration of treatment versus eventual withdrawal of access, Deacon et al., 2010), the nature of the anxiety problem (e.g., specific phobias versus other anxiety disorders; Hood et al., 2010), and details pertaining to research methodology (e.g., assurance of safety across experimental groups via informed consent; Sy et al., 2011). An important avenue for further development in this domain is the standardized assessment of safety behaviour that reflects current understanding of the differences between adaptive and maladaptive safety and coping strategies used by anxious individuals. As stressed by Hood et al. (2010) in their study of the effects of safety behaviour use during exposure treatment, participants were not always able to specify the intended function of the strategies they used. This allowed for the possibility that adaptive coping strategies were confounded with safety behaviour (differences between these are further discussed below), which posed a challenge for the interpretability of the authors' findings. They suggested the need for "a more precise measurement of the purpose and perceived utility of the safety strategies" (p. 1168).

Thus, a theoretically and psychometrically sound measure of safety behaviour is essential for future work aiming to explore the nuances of its effects on anxiety and its treatment. Currently, there are few published measures of safety behaviour, and they do not appear to be well used in the research literature. Researchers have instead tended to

rely on informal questionnaires or interviews with unknown psychometric properties (e.g., Abramowitz & Moore, 2007; Kim, 2005; McManus, et al., 2008; Taylor & Alden, 2010). Their choices are likely based on the need for an assessment tool that fits the characteristics of a given sample and protocol and on the paucity of reliable and valid measures that meet this requirement.

A significant challenge for constructing a sound safety behaviour measure is the highly idiosyncratic nature of the behaviour and, by extension, the difficulty in distinguishing it from adaptive coping strategies (Parrish et al., 2008; Thwaites & Freeston, 2005). Whereas coping strategies are used for the purpose of anxiety reduction, unlike safety behaviour, they do not maintain or worsen anxiety because they are not aimed at preventing catastrophe (Thwaites & Freeston, 2005). The clarity of this theoretical distinction, however, can easily degrade in a clinical context. Indeed, Thwaites and Freeston proposed that safety behaviour and adaptive coping strategies possibly occur on a continuum; thus, the same behaviour might be used with markedly different intention and outcome across different contexts, or perhaps even within the same situation. They therefore emphasized that assessment of safety behaviour/coping strategies requires an understanding of the intention for their use, their perceived function in a particular context, and the consequences of their use in terms of beliefs and behaviours.

Accordingly, it is problematic that most existing measures consist of items that were predetermined by their developers to represent maladaptive safety behaviour (e.g., Cuming et al., 2009; Kamphuis & Telch, 1998; McManus et al., 2008). Whereas the identification of such items has typically been both theoretically based and clinically

informed, it is their topology and frequency of use that is principally assessed by current measures, which, as noted by Thwaites and Freeston (2005), limits our understanding of their function. Notably, in a study of the effects of safety behaviour in social anxiety disorder, Okajima and colleagues (2010) observed that socially anxious participants and healthy controls reported the same number of safety behaviours in social situations. The authors discussed the possibility that such behaviour might be more closely associated with catastrophic beliefs in the former group. They also suggested that some of the endorsed safety strategies might function as adaptive coping behaviour. Their findings highlight the difficulty in distinguishing between maladaptive and adaptive behaviour in absence of understating participants' intent for the use of given strategies.

It appears that the maladaptive aspect of safety strategies, based on existing measures, is widely assumed to be the frequency of their use, with greater frequency indicating greater problematic behaviour (e.g., Cuming et al., 2009; McManus et al., 2008; Rector, Kamkar, Cassin, Ayearst, & Laposa, 2011; Taylor & Alden, 2010). Frequent reliance on a greater number of safety behaviours has indeed been shown to be associated with greater anxiety outcomes (McManus et al., 2008). However, given discrepant findings regarding the effects of safety behaviour in exposure-based treatments, it may prove fruitful to assess other aspects of its use, particularly intent for use, as this is central to the cognitive-behavioural conceptualization of safety behaviour (Salkovskis, 1991). Consistent with this model, safety behaviour has been found to be meaningfully related to perceived threat (Salkovskis et al., 1996). Furthermore, in recent work on safety behaviour in insomnia, Hood, Carney, and Harris (in press) observed that

the severity of insomnia was associated with a greater perceived need to rely on safety behaviour but not with the frequency of its use.

Of note, Kamphuis and Telch's (1998) measure of safety behaviour used by panic patients assesses frequency of use in the context the behaviour's intention. Thus, respondents are asked to specify how often they use given strategies specifically to manage anxiety and panic vs. for other purposes. Scale anchors for the former are "never" to "always", whereas a single response option is available to indicate that a given strategy is used "but not to manage anxiety or panic". This method of assessment provides greater opportunity for differentiating between safety and coping behaviours, but it is nevertheless limited as both forms of behaviour serve to manage anxiety, whereas only the former is intended to avert feared outcomes, a critical feature not assessed by this instrument.

Current measures are further limited by their focus on assessing safety behaviour specific to one anxiety disorder, most commonly social anxiety disorder (Cuming et al., 2009, McManus et al., 2008; Okajima, Kanai, Chen, & Sakano, 2007) and panic disorder (Bassett & Edelmann, 1991; Hughes, Budd, & Greenaway, 1999; Kamphuis & Telch, 1998). The assessment of safety behaviour in obsessive-compulsive disorder (OCD) is typically conducted with instruments assessing OCD symptoms (e.g., Obsessive-Compulsive Inventory-Revised, Foa et al., 2002; Vancouver Obsessional-Compulsive Inventory, Thordarson et al., 2004), which measure a broad range of behaviour (i.e., compulsions) aimed at reducing distress and/or preventing feared outcomes associated with obsessions. While the narrowness of this approach affords greater depth of assessment for a given disorder and is highly suitable for clinical work, disorder-specific

measures might not be appropriate for use in research with mixed anxiety samples. Notably, despite their specificity, these questionnaires assess many of the same categories of safety behaviour, such as different forms of avoidance (e.g., behavioural/ agoraphobic, cognitive, stress), vigilance to somatic sensations, and distraction. Across these categories, both overt (e.g., "Carrying water in car or on your person"; Kamphuis & Telch, 1998) and subtle (e.g., "Speak in short sentences"; Cuming et al., 2009) behaviours are assessed. By contrast to the disorder-specific measures, others, such as Rector and colleagues' (2011) novel self-report instrument of reassurance-seeking, are designed to asses a specific type of safety behaviour and can be applied across the anxiety disorders.

Hughes and colleagues' (1999) Coping with Anxiety Questionnaire includes scales of not only maladaptive behaviour (avoidant coping and self-vigilance) but also a scale of effective coping, an indication of the effort to capture both safety behaviour and adaptive coping strategies; the differentiation between the two on this measures, however, rests on topology rather than assessment of function. For example, an item assessing use of distraction ("I try to ignore any anxiety symptoms I may be experiencing"), is included on the scale of effective coping, with the authors careful to distinguish this form of distraction from cognitive avoidance, emphasizing that external distraction for patients with agoraphobia and/or panic disorder might be "an intended coping strategy for avoiding self-vigilance and the possible resulting escalation of panic symptoms" (p.297). However, it is nevertheless possible that external distraction, as assessed by this item, can serve a maladaptive function in other contexts, for instance during interoceptive exposure.

Given the paucity of safety behaviour measures in the safety behaviour literature and the limitations of the few existing measures, the current study aimed to develop a novel self-report questionnaire, the Safety Behaviour Inventory (SBI), that would be applicable across the anxiety disorders and that would assess respondents' perceived necessity to rely on specific strategies during anxiety-provoking situations. I conceptualized greater perceived necessity for the use of these strategies (i.e., one's belief that it would not have been possible to endure a feared situation without their use) as corresponding to the maladaptive aspect of safety behaviour, specifically its use to avert anticipated catastrophe. The notion that safety strategies cannot be abandoned in feared situations is consistent with Salkovskis' (1991) position that anxious individuals erroneously believe that their use of these strategies is instrumental in preventing the occurrence of negative outcomes. I expected that strategies that are relied upon in anxiety-provoking situations but rated as being less essential would more closely correspond to adaptive coping behaviour, which is not aimed at preventing or minimizing feared catastrophe. Thus, the SBI was developed to assess the defining feature of safety behaviour, its intended use, and to contribute to efforts to distinguish safety behaviour and adaptive coping strategies.

This article presents the factor structure and psychometric properties of the SBI. Exploratory factor analysis was first conducted to evaluate the factor structure of the measure, followed by confirmatory factor analysis to validate the factor solution. A large sample of undergraduate student participants was randomly split in half to permit these analyses. Data are additionally presented on the internal consistency of the SBI, as well

as on its discriminant and construct validity both in the student sample and in a smaller sample of clinically anxious participants.

Method

Participants

Undergraduate student sample. Undergraduate students from Concordia University in Montreal were recruited through classroom announcements and posters. They received course credit or an entry into a cash draw for their participation in one of two studies on safety behaviour, during which they completed a battery of questionnaires. Data were collected from 642 individuals; however, 26 participants were excluded from analyses, as they did not comply with the instructions on the Safety Behaviour Inventory. This measure requires respondents to consider a recent anxiety- or fear-provoking situation when rating items and to briefly indicate what situation they had in mind; individuals who were excluded from the study either did not provide an example (i.e., by leaving this section blank) or provided one that did not clearly represent a specific situation (e.g., "Just general situation, nothing specific").

The final sample included 616 participants, and it was randomly divided into two sub-samples (n = 308 each) to allow for exploratory and confirmatory factor analyses. Participants whose data were used for exploratory factor analysis (EFA) had a mean age of 23.46 years (SD = 5.79, range 18 to 52 years) and the majority (86.7%) were women. They reported a mean of 2.78 (SD = 2.07) years of university education. The majority identified their ethnicity as being of European origin (75.3%), with the remainder identifying as East Asian, African Canadian, Multi-Ethnic, Middle Eastern, Hispanic, Other, and South Asian (see Table 6.1 for frequencies). Their scores on the Beck Anxiety

Table 6.1

Participant Characteristics in Nonclinical (EFA, CFA) Sub-Samples and a Clinical Sample

Characteristic	EFA Sample	CFA Sample	Clinical Sample[a]
n	308	308	39
Age, *M (SD)*	23.46 (5.79)	22.98 (5.07)	32.82 (12.49)
Gender, *%*			
Women	86.7	80.2	79.2
Men	13.3	19.8	30.8
Years in University, *M (SD)*	2.78 (2.07)	2.84 (2.44)	3.23 (3.14)
Ethnicity[b], *%*			
European	75.3	73.4	71.1
African Canadian	4.5	3.9	0
East Asian	6.8	5.8	7.9
South Asian	1.3	3.6	2.6
Hispanic	1.9	1.6	5.3
Middle Eastern	3.9	4.9	2.6
Multi-Ethnic	4.2	4.2	10.5
Other	1.9	2.6	0
BAI, *M (SD)*	10.24 (9.72)	10.36 (10.00)	23.08 (14.48)
BDI-II, *M (SD)*	9.68 (9.49)	8.81 (8.34)	21.46 (12.34)
SCL-90-R: GSI, *M (SD)*	.62 (.59)	.61 (.52)	1.44 (.81)
Current Psychiatric Disorder[c], *%*	7.8	5.8	100

Note. EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis; BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory-II; SCL-90-R: GSI = Symptom Checklist-90-Revised: General Severity Index.

[a] Principal diagnosis is an anxiety disorder. [b] Frequencies based on percentage of participants who reported on their ethnicity (*n* = 308 each for EFA and CFA samples, *n* = 38 for Clinical sample). [c] Based on self-report for EFA and CFA samples; based on clinical diagnostic interview for clinical sample.

Inventory (BAI; Beck et al., 1988), Beck Depression Inventory-II (BDI-II; Beck et al., 1996), and Symptom Checklist-90-Revised (SCL-90-R; Derogatis 1977, 1994) were representative of a nonclinical population (see Table 6.1). Correspondingly, 7.8% of participants in this sub-sample indicated that they have a current psychiatric disorder.

Participants (80.2% women) in the sub-sample for confirmatory factor analysis (CFA) reported a mean age of 22.98 (*SD* = 5.07) and 2.84 (*SD* = 2.44) years of university education. The majority endorsed an ethnicity of European origin (73.4%), with the rest endorsing East Asian, Middle Eastern, Multi-Ethnic, African Canadian, South Asian, Other, and Hispanic ethnic backgrounds (see Table 6.1 for frequencies). Their scores on the BAI (Beck et al., 1988), BDI-II (Beck et al., 1996), and SCL-90-R (Derogatis 1977, 1994) were representative of a nonclinical population (see Table 6.1), and 5.8% indicated that they have a current psychiatric disorder.

There were no significant differences between the two sub-samples in terms of age, education, ethnicity, current psychiatric disorder, and scores on the BAI, BDI, and SCL-90-R. The sub-samples also did not differ in terms of total SBI scores. They did, however, have different gender distributions, with participants in the EFA sub-sample being significantly more likely to be female than those in the CFA sub-sample, $\chi^2(1) = 4.70$, $p < .05$, $\Phi = .09$.

Clinical sample. Clinical participants were drawn from a study on safety behaviour and treatment acceptability, during which they completed a battery of questionnaires that included the SBI. They were recruited through newspaper and internet classified ads seeking individuals with current anxiety problems and through posters posted at Concordia University and in the surrounding community. Interested individuals

were screened by telephone; those who endorsed symptoms of an anxiety disorder, who denied symptoms of psychosis (based on criteria from the Diagnostic and Statistical Manual of Mental Disorders; American Psychiatric Association, 2000), and who had never received cognitive-behavioural or exposure therapy were invited to the laboratory for a clinical diagnostic interview (see below). Forty-one individuals were interviewed, of which 40 met criteria for a principal diagnosis of an anxiety disorder and completed the study. One participant's data were excluded from analyses due to noncompliance with instructions on the SBI (i.e., when asked to indicate the anxiety- or fear-provoking situation that guided responses on the SBI, responded with "Of useful tools"). Thus, the final clinical sample included 39 participants.

Participants had a mean age of 32.82 (*SD* = 12.49) years, and 79.20% were women. They reported a mean of 3.23 (*SD* = 3.14) years of university education. The majority endorsed an ethnic background of European origin (71.1%), with the rest identifying as Multi-Ethnic, East Asian, Hispanic, South Asian, and Middle Eastern (see Table 6.1 for frequencies). One participant did not respond to the question about ethnicity. Participants' scores on the BAI (Beck et al., 1988), BDI-II (Beck et al., 1996), and SCL-90-R (Derogatis 1977, 1994) were consistent with those of clinical populations (see Table 6.1). All participants in this sample had a principal diagnosis of at least one anxiety disorder. The majority (62%) of participants also had a comorbid disorder. The mean number of comorbid diagnoses was 1.5, with the most frequently occurring comorbidities being Specific Phobia (20%), Obsessive-Compulsive Disorder (20%), and Dysthymic Disorder (17%). In terms of principal diagnoses, the most frequently occurring diagnosis was Social Anxiety Disorder (29.5%), and additional principal

diagnoses included Obsessive-Compulsive Disorder (25%), Generalized Anxiety Disorder (20.5%), Specific Phobia (13.6%), and Panic Disorder with or without Agoraphobia (11.4%). Inter-rater reliability, calculated across both principal and additional diagnoses for a subset (20%) of interviews, was excellent ($k = .95$).

Compared[6] to student participants (EFA and CFA samples combined), clinically anxious participants were older, $t(39) = 4.77$, $p < .001$, $d = 1.00$, and more likely to be male, $\chi^2(1) = 5.15$, $p < .05$, $\Phi = .09$. Unsurprisingly, compared to the students, they had significantly higher scores on the BAI, $t(40) = 5.43$, $p < .001$, $d = 1.03$, the BDI-II, $t(41) = 6.08$, $p < .001$, $d = 1.13$, and on the Global Severity Index of the SCL-90-R, $t(40) = 6.24$, $p < .001$, $d = 1.18$.

Measures

Safety Behaviour Inventory (SBI). The current study was designed to evaluate this novel 52-item measure (see Appendix H). Items were generated in collaboration with members of the Fear and Anxiety Disorders Laboratory at Concordia University based on theoretical conceptualizations (e.g., Salkovskis, 1991; Thwaites & Freeston, 2005) and existing measures of safety behaviour and anxiety coping strategies (e.g., Hughes et al., 1999; Kamphuis & Telch, 1998), as well as clinical reports. Items were selected to represent strategies that would be broadly applicable across the anxiety disorders.

According to Salkovskis (1991), anxious individuals rely on safety behaviour in order to prevent anticipated catastrophic outcomes. I thus selected *perceived need* for use of given strategies in feared situations as an indicator of the extent to which they are adaptive or maladaptive, expecting that strategies endorsed as being absolutely essential to one's ability to cope with a situation would correspond most closely to having a

maladaptive function (i.e., one that is aimed at reducing or eliminating catastrophic outcomes). Accordingly, the SBI requires respondents to indicate to what extent given strategies were essential to their ability to endure a recent anxiety- or fear-provoking situation, with response options coded along a 6-point Likert scale ranging from "did not use" (= 0) to "extremely essential—could not have endured situation without it" (= 5). The total score is calculated by summing the item scores, none which require reverse coding. To ensure that participants were complying with instructions, they were asked to indicate what situation they had in mind while completing the measure.

Coping with Anxiety Questionnaire (CAQ). The CAQ (Hughes et al., 1999), a revised version of Bassett & Edelmann's (1991) CAQ, is a 19-item self-report measure of coping strategies for anxiety and panic. Respondents are asked to rate the frequency of their use in anxiety-provoking situations. The CAQ consists of three subscales assessing effective coping, avoidant coping, and self-vigilance, which have demonstrated acceptable to good internal consistency (α = .83, .76, and .74, respectively) in a sample of participants with agoraphobia and/or panic disorder (Hughes et al., 1999). In the current study, the CAQ subscales had acceptable to good internal consistency in the two nonclinical sub-samples (effective coping mean α = .72; avoidant coping mean α = .82; self-vigilance mean α = .82). In the clinical sample, internal consistency of the avoidant coping subscale was acceptable (α = .72), whereas it was below the acceptable range for the effective coping (α = .66) and self-vigilance (α = .66) subscales.

Anxiety Control Questionnaire-Revised (ACQ-R). The ACQ-R (Brown et al., 2004) is a 15-item self-report measure of one's perceived ability to control anxiety-related emotional reactions and external threats. The total scale score represents a higher-

order construct of perceived anxiety control and is comprised of three lower-order constructs, including emotion control, threat control and stress control. The ACQ-R has demonstrated good internal consistency with both clinically anxious (α = .85; Brown et al., 2004) and nonclinical participants (α = .87; Moulding & Kyrios, 2007). It similarly demonstrated good internal consistency in both the clinical (α = .84) and nonclinical (mean α = .88) samples in the current study.

Agoraphobic Cognitions Questionnaire (ACQ). The ACQ (Chambless et al., 1984) is a 14-item self-report measure of the frequency of maladaptive cognitions about the consequences of experiencing anxiety or panic, including social/behavioural concerns and physical concerns. This measure has good internal consistency (α = .80; Chambless et al., 1984) and good (*r* = .86; Chambless et al., 1984) to excellent (*r* = .92; Arrindell, 1993) test-retest reliability, and it has demonstrated convergent and discriminant validity (Chambless et al., 2000; Chambless & Gracely, 1989). In the current study, the ACQ was administered only to nonclinical participants, as the battery of questionnaires completed by clinically anxious participants was part of a different study that did not include this measure. It demonstrated good internal consistency in the two nonclinical sub-samples (mean α = .83).

Anxiety Sensitivity Index (ASI). The ASI (Reiss, Peterson, Gursky, & McNally, 1986) is a 16-item self-report measure that assesses fear of anxiety-related symptoms based on one's concerns about the negative consequences of anxiety. It has been shown to have good to excellent internal consistency (α range = .82 - .91) and acceptable test-retest reliability (*r* = .75; Peterson & Reiss, 1993), and it has demonstrated satisfactory criterion and construct validity (Peterson & Reiss, 1993; Reiss et al., 1986). In the current

study, the ASI demonstrated good to excellent internal consistency when administered to nonclinical (mean α = .87) and clinically anxious (α = .90) participants, respectively.

Beck Anxiety Inventory (BAI) and Beck Depression Inventory-II (BDI-II). The BAI (Beck et al., 1988) and BDI-II (Beck et al., 1996) are widely used self-report measures of symptoms of state anxiety and depression, respectively, each consisting of 21 items. The BAI has been shown to have excellent internal consistency (α = .92), as well as convergent and divergent validity in a sample of outpatients (Beck et al., 1988). The BDI-II also has excellent internal consistency, with Cronbach's alphas of .92 and .93 in a samples of outpatients and college students, respectively (Beck et al., 1996). It has demonstrated convergent and divergent validity (Beck et al., 1996; Steer & Clark, 1997). Both measures had excellent internal consistency in the current study in both nonclinical sub-samples (BAI mean α = .92; BDI-II mean α = .94) and in the clinical sample (BAI mean α = .92; BDI-II mean α = .93).

Symptom Checklist-90-Revised (SCL-90-R). The SCL-90-R (Derogatis 1977, 1994) is a 90-item self-report instrument commonly used to assess the presence of a broad range of current psychological problems and the intensity of their symptoms. It includes nine subscales representing symptom dimensions (αs = .77 - .90; Derogatis et al., 1976) and three global indices. Support for the divergent validity of the subscales has been mixed (Schmitz et al., 2000; Vassend & Skrondal,1999); thus, the SCL-90-R was administered as a measure of general psychological distress, as assessed by its Global Severity Index (GSI). In the current study, this index demonstrated excellent internal consistency in all participant groups (all αs = .98).

Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV). The ADIS-IV (Di Nardo et al., 1994) is a semi-structured clinical interview that assesses the presence of current anxiety, mood, substance use, and somatoform disorders based on DSM-IV criteria. It also includes screening questions for psychotic and conversion symptoms. It has demonstrated varied inter-rater reliability (r = .68 to .99), depending on the point of assessment (Tsao et al., 1998), as well as good test-retest reliability (Di Nardo et al., 1993). The ADIS-IV was administered to establish the diagnostic status and symptom severity of participants in the clinical sample.

Procedures

The study was administered via the Internet to student participants. After contacting the principal investigator by email or telephone, participants received an ID number to log into the online portal containing a battery of questionnaires. They were required to complete all measures in a single session that lasted approximately one hour.

Clinical participants who met eligibility criteria during a telephone screen were invited to the laboratory for an individual session, during which they were administered the ADIS-IV (Di Nardo et al., 1994). If they met criteria for a principal diagnosis of an anxiety disorder, they then completed a study on safety behaviour and treatment acceptability (conducted during the same session). This study consisted of the completion of online forms on a laboratory computer and included, among a broader set of measures, the same questionnaires administered to student participants in the current study (with exception of the ACQ) . It took approximately one hour to complete the online forms.

Results

Data Screening

SPSS 19 software was used to conduct preliminary analyses on the SBI to identify outliers and to assess assumptions of univariate normality in both the EFA and CFA sub-samples. Multivariate normality was assessed with AMOS 19 software. As the online forms required participants to respond to all questions presented to them before they could move on to the next page, there were no missing data in either group.

Mahalanobis distance was calculated for individual SBI items and a chi-square cutoff of $p < .001$ was implemented to identify multivariate outliers. Seventeen and 26 multivariate outliers were identified and eliminated from the EFA and CFA datasets, respectively. SBI total scores were then converted to z-scores to identify univariate outliers. Standard scores greater than +/-3.29 ($p < .001$, two-tailed; Tabachnick & Fidell, 2001) were excluded, which included one case in the EFA dataset and three cases in the CFA dataset.

Following the elimination of outliers, the distribution of SBI total scores was assessed for skewness and kurtosis. Standardized scores indicated that skew and kurtosis were nonsignificant in both datasets, EFA: z(skew) = .93, z(kurtosis) = -.34; CFA: z(skew) = -.93, z(kurtosis) = -.52. For the EFA sub-sample, the Kolmogorov-Smirnov (K-S) test also suggested a normal distribution of total scores, $D(290) = .03$, $p = .20$, as did visual inspection of a histogram of frequency distributions and of a normal Q-Q plot. For the CFA sub-sample, the K-S test was significant, $D(279) = .06$, $p = .02$, suggesting a non-normal distribution. It is possible, however, for this test to be significant in larger samples even when deviations from normality are minimal (Field, 2009). Visual

inspection of a histogram and Q-Q plot suggested that the SBI total scores were normally distributed in this sub-sample.

Normality of the distribution of scores of individual SBI items was also assessed. In the EFA sub-sample, thirty-two items (71%) on the SBI were found to have a significant positive skew and one item had a significant negative skew (z-scores > +/-3.30, $p < .001$). Significant kurtosis was observed for 30 items (13 positive; 17 negative; z-scores > +/-3.30, $p < .001$). The K-S test was significant ($p < .001$) for all items, and a visual inspection of histograms and Q-Q plots for each item supported the findings of significant nonnormality in the EFA dataset. Similarly, analyses of the CFA dataset indicated severe skew, with significant positive skew for 38 items (73%) and significant negative skew for one item (z-scores > +/-3.30, $p < .001$). Significant positive kurtosis was observed for 30 items (10 positive, 20 negative; z-scores > +/-3.30, $p < .001$). As in the EFA sub-sample, the K-S test was significant ($p < .001$) for all items, and histograms and Q-Q plots for each item further suggested significant nonnormality of each SBI item in the CFA dataset.

Multivariate normality was assessed with Mardia's coefficient of kurtosis (Mardia, 1970), which yielded a value of 330.03 (normalized estimate = 37.50) for the EFA sub-sample. The coefficient for the CFA sub-sample was 344.98 (normalized estimate = 38.34). Thus, in both groups, the data demonstrated a significant departure from a multivariate normal distribution.

The lack of normality in terms of individual item SBI scores and in terms of their multivariate distribution is unsurprising given the sample characteristics (i.e., nonclinical) and the expectation that many of the 52 strategies on the SBI would not be used by a

specific individual in a given anxiety-provoking situation, which is reflected in the positive skew of most items. I elected not to transform the data in order to preserve its ecological validity and instead used an extraction method in EFA that has no distributional assumptions for factor loading estimates. For CFA analyses, I implemented a bootstrapping method, as described below.

Factor Structure

The factor structure of the SBI was examined with exploratory and confirmatory factor analyses using SPSS 19 and AMOS 19 software, respectively. EFA was conducted to identify possible lower order factors of the SBI and CFA was subsequently conducted to validate the factor solution in a different group of participants. Using the *Select Cases* (random sample of 50% of cases) function in SPSS, the student sample was split into two groups, each with $n = 308$. Removal of outliers resulted in a final sample size of 290 participants in the EFA group and 279 participants in the CFA group.

Recommendations for adequate sample size for EFA vary widely (Floyd, & Widaman, 1995). Guidelines are centered on the participants-to-variables ratio (e.g., Bryant & Yarnold, 1995), the absolute number of cases (Comrey & Lee, 1992), and the nature of the data (e.g., MacCallum, Widaman, Zhang, & Hong, 1999), with the possibility of compensating for weaknesses in one area with strengths in another (Guadagnoli & Velicer, 1988; Velicer & Fava, 1998). Based on literature discussing the need to balance multiple criteria in determining minimal sample size in factor analysis (Costello & Osborne, 2005; Guadagnoli, & Velicer, 1988; MacCallum et al., 1999), the size of the EFA sub-sample in the current study is on the lower end of the acceptable range.

There is similarly little consensus for sample size guidelines for CFA (Gagné & Hancock, 2006). Common recommendations include ratios ranging from 5 to10 participants per estimated free parameter (Bentler & Chou, 1987; Schreiber, Nora, Stage, Barlow, & King, 2006), although there has been a recent shift away from these guidelines, with greater focus on model quality (Gagné & Hancock, 2006). In the CFA of two models described below, the ratios ranged from approximately 5 to 6 participants per parameter.

EFA. Principal axis factoring (PAF) was selected as the method of factor extraction. This method relies only on shared variance to generate a solution and is used to uncover the structure of latent variables, by contrast to principal components analysis (PCA), a data reduction technique that analyzes all variance within a variable. While there is typically little difference in the solutions generated by the two extraction methods (Velicer & Jackson, 1990), PCA is vulnerable to producing inflated factor loadings (Gorsuch, 1997; Snook & Gorsuch, 1989). For this reason, Costello and Osborne (2005) proposed that PAF is preferable to that of PCA. Furthermore, PAF, in particular, has been recommended as the extraction method when multivariate normality is violated (Fabrigar, Wegener, MacCallum, & Strahan, 1999), as is the case in the current study.

Following extraction of the initial unrotated solution, items with low extraction communalities were deleted from the dataset (Costello & Osborne, 2005; Tabachnick & Fidell, 2001). The analysis was re-run following each deletion until all communalities had a value of at least .30. Five items were deleted during this process.

Several indices were next used to evaluate the suitability of the data for factor analysis. Inspection of the correlation matrix indicated that 15% of correlations were

>.30, and Bartlett's test of sphericity (Bartlett, 1954) was significant, $\chi^2(1081) = 5690.55$, $p < .0001$, further indicating that correlations between items were large enough for EFA. Factorability was also supported by the Kaiser–Meyer–Olkin (KMO; Kaiser, 1970) measure of sampling adequacy, which was .85 (minimum recommended value = .60; Tabachnick & Fidell, 2001). In addition, the values along the diagonal of the anti-image correlation matrix all exceeded .70, and the off-diagonal values were small ($M = .07$; SD = .06), which also suggested that the data were factorable (Tabachnick & Fidell, 2001).

Parallel analysis (Horn, 1965) and the scree test (Cattell, 1966) were used to determine the number of factors to retain. Parallel analysis is widely considered to be one of the most accurate methods in determining factor retention in EFA (Glorfeld, 1995; Zwick & Velicer, 1986). It was performed with SPSS syntax from O'Connor (2000), with the results from 1000 random data sets suggesting a seven-factor solution when both the mean and the 95th percentile eigenvalue criteria were applied. Examination of the breaks in the scree plot suggested a seven- or nine-factor solution. Given the convergence of the scree test with parallel analysis on seven factors, as well as evidence that the scree test can overestimate the number of factors (Zwick & Velicer, 1986), seven factors were extracted. As it was expected that the factors would correlate to some degree, an oblique (direct oblimin) rotation was applied. The seven-factor solution included one factor that had only two items with adequate loadings (≥.32; Tabachnick & Fidell, 2001). The weak structure of this factor remained unaltered following refinement of the scale, which included gradual removal of items with communalities <.30, complex items (loadings ≥.32 on more than one factor), and items with small loadings (<.32) across all factors.

As factors with fewer than three items are considered unstable (Costello & Osborne, 2005), PAF was repeated with an oblimin rotation several times—extracting six, five and four factors—with the aim of identifying the solution with the strongest structure. The solutions were compared in terms of the number of salient items per factor, simplicity of the factor structure, variance accounted for, internal consistency, and factor interpretability. The six-factor solution was the weakest of the three, with nine crossloading and low loading items. Following removal of weak items as detailed above, the factors had an adequate number of salient items, and the overall solution had a simple structure and accounted for 47.35% of variance. However, two factors had less than acceptable ($\alpha<.70$) internal consistency and one factor was difficult to interpret.

The four- and five-factor solutions each initially contained five crossloading and low loading items. After removal of weak items, each solution demonstrated a simple structure with at least four salient loadings per factor. The two solutions accounted for a similar amount of variance (44.50% and 46.76% by four and five factors, respectively) and they consisted of a similar number of total items (23 and 25, respectively). Internal consistency, however, was not acceptable for two factors in the five-factor solution and one factor was difficult to interpret. By contrast, Cronbach's alphas for factors in the four-factor solution ranged from acceptable to good (see Table 6.3), and all factors were readily interpretable. Based on these considerations, the four-factor solution was deemed the most optimal, and it also offered the most parsimonious representation of the data. Four factors were thus retained (see Table 6.2 for the pattern matrix of the rotated solution and item means).

Table 6.2

Four-Factor Obliquely Rotated Solution from Exploratory Factor Analysis of the SBI: Factor Loadings, Communalities, and Descriptive Characteristics of Items

	Factors					
SBI Items	1	2	3	4	h^2	*M* (*SD*)
Escape/Vigilance to Threat						
18. I checked the presence of escape routes.	**.97**	-.03	.02	-.06	.90	1.08 (1.54)
20. I positioned myself close to an escape route.	**.88**	.05	.03	-.01	.76	1.08 (1.57)
9. I planned my escape route.	**.82**	-.01	-.06	-.03	.71	1.30 (1.63)
10. I scanned the environment for additional threats.	**.65**	-.02	-.01	.02	.44	1.12 (1.54)
4. I physically left the situation as soon as it was possible.	**.53**	-.02	-.18	.04	.40	1.85 (1.76)
Companionship/Reassurance Seeking						
29. I asked someone for reassurance.	-.07	**.69**	-.07	-.08	.47	1.87 (1.87)
48. I went to see somebody.	-.06	**.67**	-.04	.00	.45	1.06 (1.59)
23. I conversed with a companion.	-.06	**.65**	.09	.14	.46	2.20 (1.78)
42. I called somebody.	.07	**.63**	-.03	-.11	.40	1.58 (1.82)
25. I made sure I wasn't alone.	.20	**.49**	.12	.21	.37	1.57 (1.75)
Cognitive Avoidance/Disengagement						
34. I made myself numb.	-.10	-.01	**-.62**	-.08	.32	.41 (1.05)
7. I closed my eyes or looked away.	-.03	-.05	**-.61**	.06	.38	1.44 (1.66)
1. I pretended not to be there.	.17	.00	**-.54**	.09	.43	.74 (1.33)
2. I stood very still.	.21	.01	**-.53**	.03	.42	.96 (1.39)
14. I avoided being seen by others.	.14	-.06	**-.52**	.15	.41	.85 (1.42)
32. I moved about very slowly.	.16	.17	**-.49**	-.08	.36	.79 (1.31)
30. I focused my gaze on something else.	.08	.05	**-.47**	.17	.35	1.37 (1.58)
Positive Focus/Minimization						
8. I thought of pleasant/calming images.	-.08	.04	-.09	**.64**	.44	1.75 (1.69)
3. I focused on more pleasant aspects of the situation.	.00	.00	.05	**.63**	.38	2.40 (1.65)
45. I told myself it was nothing.	.07	-.06	.11	**.58**	.32	2.09 (1.73)
47. I tried to control my thoughts.	-.06	.10	-.20	**.53**	.40	2.27 (1.75)
46. I imagined myself in a safe place.	.03	.05	-.24	**.48**	.46	1.02 (1.60)
Eigenvalue	5.54	2.72	2.10	1.70		
Variance (%)	22.99	10.07	7.13	5.04		
Cumulative variance (%)	22.99	33.06	40.19	45.23		

Note. SBI = Safety Behaviour Inventory; h^2 = communality.

Table 6.3

Mean Scores and Internal Consistency of SBI Factors and Full Scale in EFA and CFA Sub-Samples and a Clinical Sample

	EFA Sub-Sample (*N*=290)		CFA Sub-Sample (*N*=279)		Clinical Sample (*N*=39)	
Subscale	Score *M* (*SD*)	α	Score *M* (*SD*)	α	Score *M* (*SD*)	α
1	6.43 (6.65)	.89	5.97 (6.24)	.85	10.44 (8.29)	.92
2	8.28 (6.33)	.77	8.57 (6.86)	.83	8.36 (7.17)	.80
3	6.56 (6.54)	.79	6.13 (5.76)	.75	9.56 (7.70)	.76
4	9.54 (5.87)	.73	9.00 (5.32)	.66	10.46 (5.56)	.69
SBI-Total	30.82 (16.87)	.85	29.67 (16.37)	.84	38.82 (21.85)	.89

Note. EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis; SBI = Safety Behaviour Inventory; α = Cronbach's alpha; Subscale 1 = Escape/Vigilance to Threat; Subscale 2 = Companionship/Reassurance Seeking; Subscale 3 = Cognitive Avoidance/Disengagement; Subscale 4 = Positive Focus/Minimization.

Examination of the items that grouped on the same factors suggested that the following categories of safety and anxiety coping strategies are represented by the four factors: Factor 1 = focus on escape and vigilance to perceived threat (Escape/Vigilance to Threat), Factor 2 = pursuit of other's company and reassurance (Companionship/ Reassurance Seeking), Factor 3 = cognitive avoidance and disengagement from the situation (Cognitive Avoidance/Disengagement), and Factor 4 = emphasis on pleasant or safe thoughts and stimuli, and minimization of the severity of the perceived threat (Positive Focus/Minimization).

CFA. The four-factor solution was tested with CFA. Two models were fitted to the data, including a first-order model with four correlated factors and a higher-order (i.e., hierarchical) model with four first-order factors and one second-order factor representing general perceived necessity of using given strategies. The second model was evaluated to determine if items across the four factors can be summed together for a total scale score.

Although multivariate normality is rarely observed in social science research (Micceri, 1989), it is an important assumption of the widely used maximum-likelihood (ML) estimation in CFA, which when violated can affect the interpretability of model fit. Specifically, under conditions of multivariate non-normality, the ML χ^2 model test statistic is inflated, which increases the likelihood of erroneous rejection of the model (i.e., Type I error), whereas parameter standard errors are underestimated, resulting in inflated significance of regression paths (i.e., increased Type II error; Nevitt & Hancock, 2001). A bootstrap procedure (Efron, 1979) was thus employed to reduce potential biases arising from the data's deviation from a multivariate normal distribution. Bootstrapping is

a method of resampling with replacement from the sample data, and it makes no assumptions about normality. The Bollen-Stine bootstrap (2000 samples; Bollen & Stine, 1992) was used to obtain a corrected *p*-value for the χ^2 statistic, with $p < .05$ indicating poor fit. In addition, bootstrapping was implemented to generate adjusted standard errors and confidence intervals for parameter estimates in the model.

Model fit was further evaluated with a combination of goodness-of-fit indices, selected based on their sensitivity to different elements of fit (Hu & Benteler, 1999). Indices (with recommended cutoff values in parentheses) included the Comparative Fit Index (CFI; >.90 acceptable, >.95 excellent; Bentler, 1990), the Tucker Lewis Index (TLI; >.90 acceptable, >.95 excellent; Tucker & Lewis, 1973), the Root Mean Square Error of Approximation (RMSEA; <.08 acceptable, ≤ .05 excellent; Brown & Cudeck, 1993) and its 90% confidence interval (Steiger, 1990), and the Standardized Root Mean Square Residual (SRMSR; < .08; Hu & Bentler, 1999). These indices were also compared to evaluate differences in fit between the two models. The Akaike Information Criterion (AIC; Akaike, 1987) was additionally used to compare the models, with smaller values on this index indicating better fit (Hu & Bentler, 1995). It has been suggested that a difference of 10 or more between two models on the AIC is meaningful (Burnham & Anderson, 1998).

To ensure identification of the models, one path for each latent variable was constrained to 1, based on recommendations for bootstrap analysis (Byrne, 2010). For the first-order model, the initial iteration demonstrated a poor model fit, $\chi^2(203) = 475.54$, Bollen-Stine bootsrap $p < .001$; CFI = .86; TLI = .84; RMSEA = .07, CI_{90} = [.06, .08]; SRMR = .08. Examination of modification indices revealed that the addition of several

covariance paths between select error terms would improve fit. I decided to add paths between error terms of items within the same factor; based on their content, I expected these items to share error. Following the addition of eight such paths (see Figure 6.1 for paths and Table 6.2 for item content), the model demonstrated acceptable to good fit with the data based on most indices, CFI = .92; TLI = .92; RMSEA = .05, CI_{90} = [.04, .06]; SRMR = .07. The bootstrap *p* value for the chi-square statistic, although markedly improved compared to the initial iteration, remained significant, $\chi^2(195) = 345.99$, Bollen-Stine $p = .01$. Of note, the bootstrap *p* is similar to the model chi-square in its sensitivity to sample size (i.e., it is likely to suggest poor fit in larger samples) and should thus be interpreted alongside other indices. The relative chi-square statistic (χ^2/df) has been recommended as a more favourable fit index because it is adjusted for sample size. Its value for the current model was 1.77, indicating good fit, as it is well below the suggested cut-off value of 3 (Kline, 1998).

Examination of the standard errors of ML-based parameter estimates and those of bootstrap-based estimates indicated small to moderate differences. Bootstrap-based standard errors of regression weights (i.e., factor loadings) and covariances between factors were larger than the ML-based standard errors of these parameters by a mean of 19.61% (*SD* = 12.81) and 14.50% (*SD* = 9.53), respectively. These differences were not great enough to affect the significance of the parameter estimates, and both ML and bootstrap bias-corrected confidence intervals (90%) were associated with significant *p*-values ($p < .01$) for all factor loadings (see Figure 6.1 for loadings). The ML and bootstrap bias-corrected results also indicated similar significance levels for covariances between factors ($p < .05$; see Figure 6.1 for covariances).

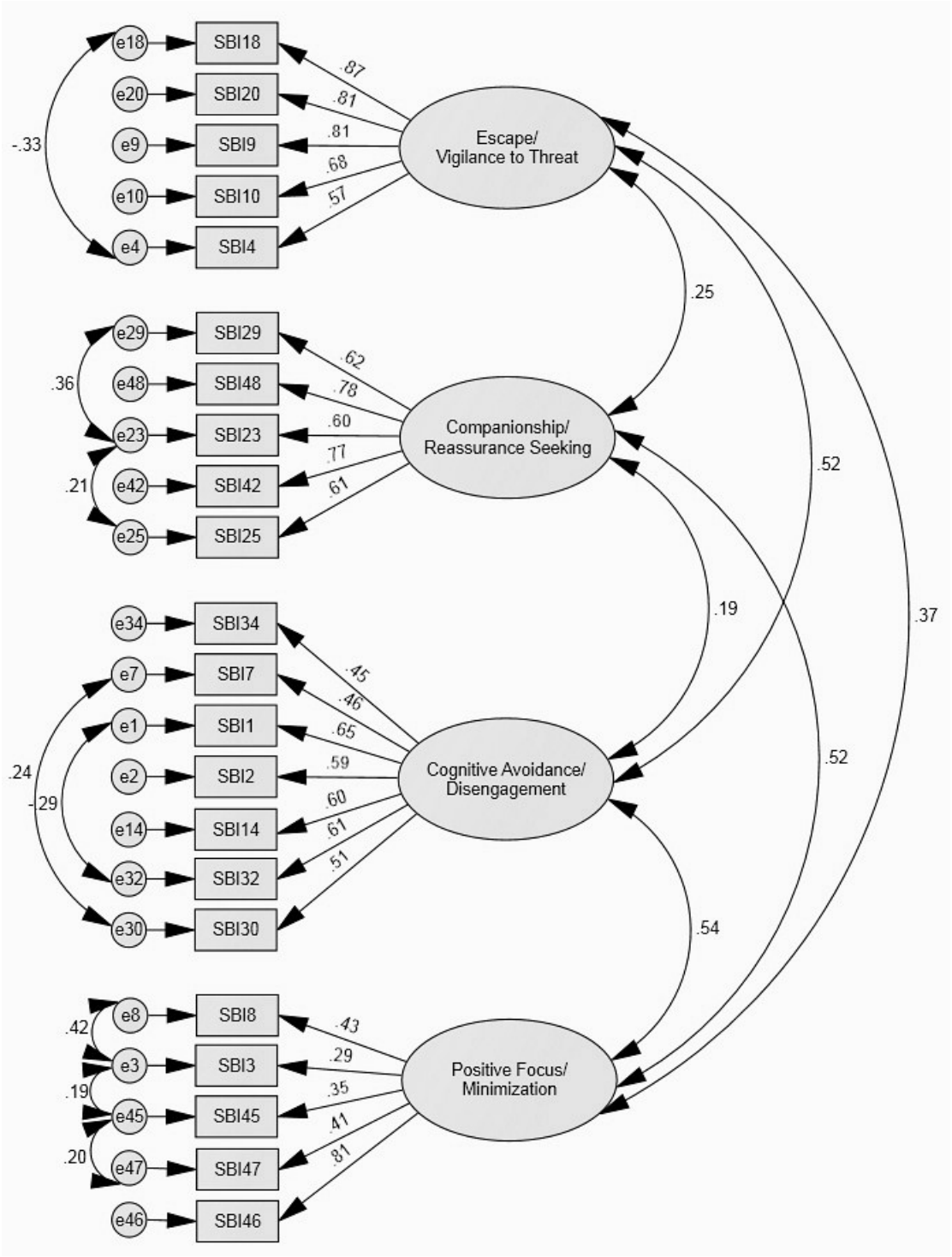

Figure 6.1. Confirmatory factor analysis of a first-order four-factor model of the Safety Behaviour Inventory. All factor loadings and covariances are significant at $p < .01$.

The hierarchical model (see Figure 6.2) was next evaluated to determine whether it is appropriate to calculate scores across the first-order factors to produce one second-order factor score representing overall perceived necessity of using given strategies in anxiety-provoking situations. Results of the initial iteration indicated poor model fit to the data, $\chi^2(205) = 515.28$, Bollen-Stine bootstrap $p < .001$; CFI = .84; TLI = .82; RMSEA = .07, CI_{90} = [.07, .08]; SRMR = .09. Examination of fit indices suggested that adding covariance paths between several error terms would improve fit. Paths were added only between terms within the same first-order factor (see Figure 6.2). Following eight such additions, fit was improved and most indices indicated that it was in the acceptable range, CFI = .91; TLI = .90; RMSEA = .06, CI_{90} = [.05, .07]; SRMR = .08. The bootstrap *p* value for the chi-square statistic suggested poor fit, $\chi^2(197) = 367.34$, Bollen-Stine bootstrap $p < .01$, whereas the relative-chi square index indicated acceptable fit, $\chi^2/df = 1.86$. As in the first-order model, there were small to moderate differences between standard errors for the ML-based factor loadings and those of bootstrap-based estimates. The latter were larger by a mean of 23.43% (*SD* = 17.18). Bootstrap bias-corrected confidence intervals and associated *p* values indicated that the second-order factor loaded significantly onto each of the four first-order factors (*p*s < .01; see Figure 6.2 for factor loadings).

The values of fit indices for the hierarchical model suggest that this model is a poorer fit to the data than the first-order model, an observation further supported by the smaller AIC value of the first-order model and a >10 difference in AIC values between the two models (first-order model AIC = 461.99; hierarchical model AIC = 479.34). However, the fit indices for the hierarchical model were nevertheless largely within the

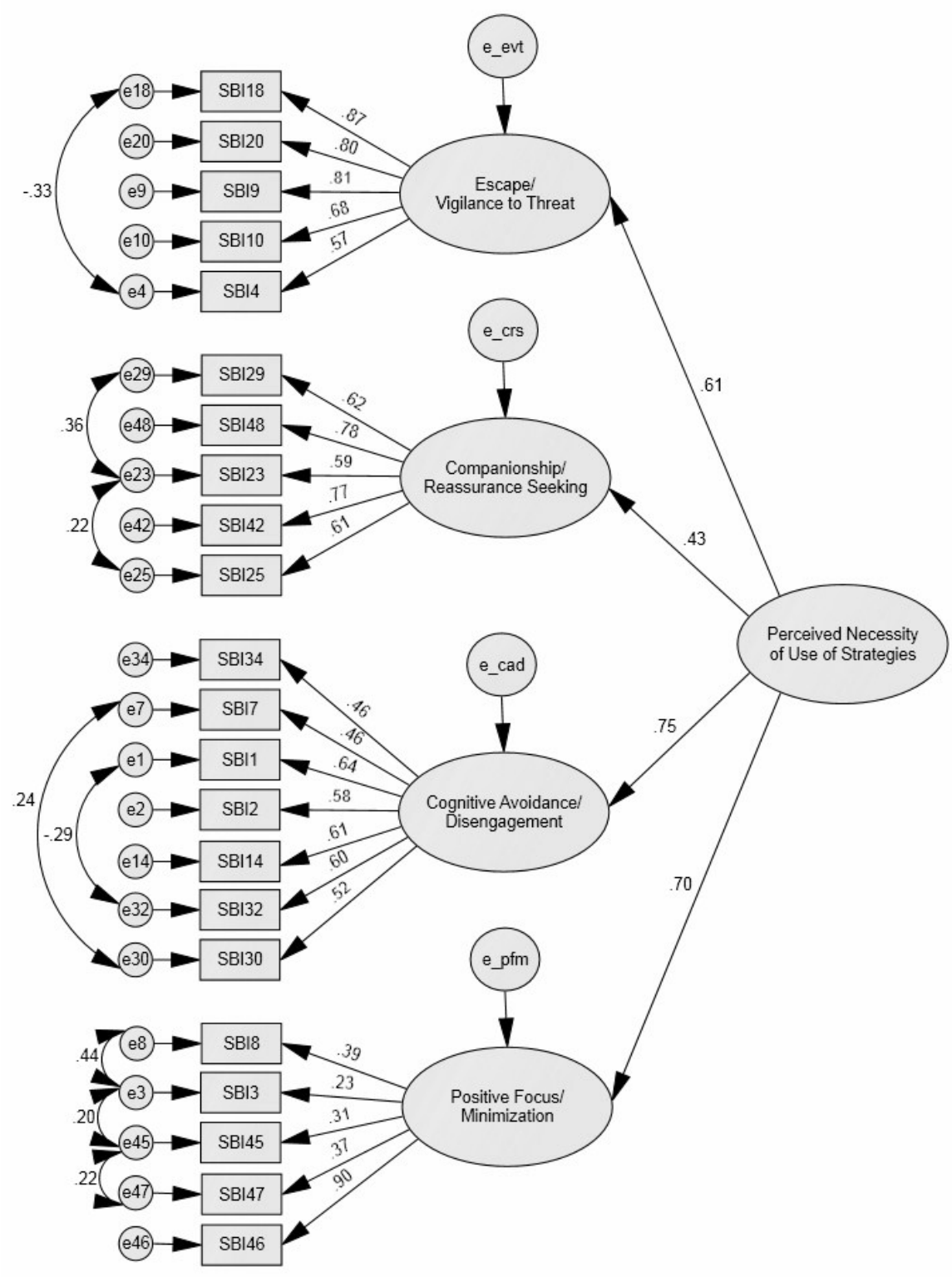

Figure 6.2. Confirmatory factor analysis of a hierarchical model of the Safety Behaviour Inventory. All factor loading paths are significant at $p < .01$.

acceptable range, and all four first-order factors loaded saliently onto the second-order factor. In addition, the 22-item SBI demonstrated good internal consistency (see Table 6.3), which was greater than that of any individual factor. These findings suggest that SBI items may be summed across the factors to produce a total score.

SBI Total Scale and Subscale Characteristics

Mean scores and internal consistency reliability of the 22-item SBI and its four subscales (based on the factors examined in EFA and CFA) are presented in Table 6.3 for the two nonclinical sub-samples and the clinical sample. The SBI demonstrated good internal consistency across all groups. Internal consistency for the Escape/Vigilance to Threat subscale ranged from good to excellent. For the Companionship/Reassurance Seeking and Positive Focus/Minimization subscales, internal consistency was in the acceptable to good range. The weakest internal consistency was observed for the Cognitive Avoidance/Disengagement factor, with Cronbach's alpha coefficients of .66 and .69 in the CFA and clinical groups, respectively, and .73 in the EFA group.

Correlations between the SBI total and subscale scores are presented in Table 6.4. All subscale scores were found to correlate significantly with the total scale score in each sample. Most correlations between subscales were significant, with the exception of the correlation between the Escape/Vigilance to Threat and the Companionship/Reassurance Seeking subscales in both the EFA and clinical samples. In addition, the correlation between Escape/Vigilance to Threat and the Positive Focus/Minimization subscales in the clinical sample was not significant.

Table 6.4

Inter-Correlations between SBI Subscale and Full Scale Scores in EFA and CFA Sub-Samples and a Clinical Sample

	Subscale	1	2	3	4
EFA Sub-Sample (*N*=290)	1	-	-	-	-
	2	.11	-	-	-
	3	.48**	.16**	-	-
	4	.19**	.23**	.36**	-
	SBI-Total	.69**	.56**	.76**	.65**
CFA Sub-Sample (*N*=279)	1	-	-	-	-
	2	.18**	-	-	-
	3	.47**	.15*	-	-
	4	.16**	.43**	.29**	-
	SBI-Total	.67**	.68**	.69**	.66**
Clinical Sample (*N*=39)	1	-	-	-	-
	2	.27	-	-	-
	3	.72**	.42*	-	-
	4	.28	.37*	.49**	-
	SBI-Total	.79**	.67**	.89**	.65**

Note. EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis; SBI = Safety Behaviour Inventory; Subscale 1 = Escape/Vigilance to Threat; Subscale 2 = Companionship/Reassurance Seeking; Subscale 3 = Cognitive Avoidance/ Disengagement; Subscale 4 = Positive Focus/Minimization.

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

Discriminant Validity

Discriminant validity was evaluated by examining whether SBI scores differentiated between clinically anxious and nonclinical participants. A series of one-way ANCOVAs was conducted comparing the clinical sample to each of the nonclinical sub-samples on the SBI total and subscale scores while controlling for age and gender. Clinically anxious participants had significantly higher scores than participants in the EFA sub-sample on the 22-item SBI, $F(1, 325) = 10.39$, $p < .01$, partial $\eta^2 = .03$, the Escape/Vigilance to Threat subscale, $F(1, 325) = 10.98$, $p < .01$, partial $\eta^2 = .03$, and the Cognitive Avoidance/Disengagement subscale, $F(1, 325) = 6.22$, $p < .05$, partial $\eta^2 = .02$. There was a trend for this difference for the Companionship/Reassurance Seeking subscale, $F(1, 325) = 2.94$, $p < .10$, partial $\eta^2 = .01$, and there were no differences between clinical participants and those in the EFA sub-sample on the Positive Focus/ Minimization subscale, $F(1, 325) = 1.09$, *n.s.*, partial $\eta^2 = .003$.

When compared to participants in the CFA sub-sample, clinically anxious participants had higher scores on the full scale SBI, $F(1, 314) = 16.26$, $p < .001$, partial $\eta^2 = .05$, as well as on the Escape/Vigilance to Threat subscale, $F(1, 314) = 15.02$, $p < .001$, partial $\eta^2 = .05$, the Cognitive Avoidance/Disengagement subscale, $F(1, 314) = 14.74$, $p < .001$, partial $\eta^2 = .05$, and the Positive Focus/Minimization subscale, $F(1, 314) = 5.04$, $p < .05$, partial $\eta^2 = .02$. There were no differences between the groups in term of their scores on the Companionship/ Reassurance Seeking subscale, $F(1, 314) = 1.45$, $p < .10$, partial $\eta^2 = .005$

These results indicate that SBI total scores, as well as scores on the Escape/ Vigilance to Threat and Cognitive Avoidance/Disengagement subscales, consistently

discriminated between clinical and nonclinical participants, although the size of these effects was small. The Companionship/Reassurance Seeking and Positive Focus/ Minimization subscales demonstrated weaker discriminant validity.

Construct Validity

Convergent and divergent validity of the SBI were evaluated through correlations of SBI total and subscale scores and scores of other administered measures, including the CAQ subscales, ACQ-R, ACQ, ASI, BAI, BDI-II, and the SCL-90-R-GSI. The results for the EFA and CFA nonclinical sub-samples and for the clinical sample are presented in Table 6.5. Differences between specific correlations within a given sample were calculated using William's (1959) test for comparing dependent correlations (as reported by Steiger, 1980), which was conducted using R software (R Development Core Team, 2005).

SBI total scores correlated significantly with all of the above measures for nonclinical participants. Perceived necessity of using given strategies to endure anxiety-provoking situations was positively associated with both effective and avoidant coping, self-vigilance, catastrophic cognitions about the consequences of experiencing anxiety or panic, anxiety sensitivity, symptoms of anxiety and depression, and general distress; it was negatively associated with perceived control over anxiety. The pattern of results was the same in the clinical sample, with the exception of an absence of association between SBI total scores and symptoms of depression.

For nonclinical participants, perceived need to use strategies focused on Escape/ Vigilance to Threat was found to be significantly positively associated with avoidant coping, self-vigilance, catastrophic cognitions about experiencing anxiety, anxiety

Table 6.5

Inter-Correlations between SBI Subscale and Full Scale Scores and Scores on Other Self-Report Measures in EFA and CFA Sub-Samples and a Clinical Sample

	Subscale	CAQ-E	CAQ-A	CAQ-V	ACQ-R	ACQ	ASI	BAI	BDI-II	SCL-90-R-GSI
EFA Sub-Sample (*N*=290)	1	.14*	.44**	.14*	-.26**	.28**	.24**	.05	.13*	.17**
	2	.10	.09	.02	-.07	.10	.08	.05	.08	.06
	3	.18**	.49**	.28**	-.36**	.43**	.33**	.32**	.26**	.37**
	4	.31**	.17**	.21**	-.05	.19**	.15*	.13*	-.01	.10†
	SBI-Total	.27**	.46**	.24**	-.29**	.34**	.31**	.21**	.18**	.27**
CFA Sub-Sample (*N*=279)	1	-.02	.41**	.19**	-.28**	.24**	.25**	.20**	.18**	.28**
	2	.14*	.13*	.17**	-.12*	.16**	.12	.14*	-.03	.11
	3	-.06	.55**	.13*	-.29**	.40**	.29**	.35**	.33**	.43**
	4	.26**	.27**	.17**	-.01	.19**	.19**	.11	-.01	.10
	SBI-Total	.11*	.49**	.24**	-.26**	.37**	.31**	.29**	.17**	.34**
Clinical Sample (*N*=39)	1	-.05[a]	.60[a]**	.19[a]	-.34*	-	.36*	.32*	.10	.30†
	2	.34[a]*	.34[a]*	.25[a]	-.21	-	.35*	.47**	.16	.47**
	3	.21[a]	.75[a]**	.27[a]	-.37*	-	.55**	.56**	.12	.53**
	4	.49[a]**	.32[a†]	.24[a]	-.22	-	.25	.31†	.01	.31†
	SBI-Total	.30[a†]	.69[a]**	.31[a†]	-.38*	-	.51**	.55**	.13	.53**

Note. EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis; SBI = Safety Behaviour Inventory; Subscale 1 = Escape/Vigilance to Threat; Subscale 2 = Companionship/Reassurance Seeking; Subscale 3 = Cognitive Avoidance/Disengagement; Subscale 4 = Positive Focus/Minimization; CAQ = Coping with Anxiety Questionnaire (subscales: E = Effective Coping, A =

Avoidant Coping, and V = Self-Vigilance); ACQ-R = Anxiety Control Questionnaire-Revised ; ACQ = Agoraphobic Cognitions Questionnaire; ASI = Anxiety Sensitivity Index; BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory-II; SCL-90-R-GSI = Symptom Checklist-90-Revised: Global Severity Index.

[a] $N = 35$.

[†] $p < .10$, * $p < .05$, ** $p < .01$.

sensitivity, depressive symptoms, and general distress, and significantly negatively associated with perceived control over anxiety. In the EFA sub-sample, this subscale was additionally significantly positively associated with effective coping, and in the CFA sub-sample, it was significantly positively associated with symptoms of anxiety. In the clinical sample, perceived need to use strategies focused on Escape/Vigilance to Threat was significantly positively associated with avoidant coping, anxiety sensitivity, and symptoms of anxiety, and it demonstrated a trend for a positive association with general distress. It was significantly negatively associated with perceived control over anxiety.

In the EFA sub-sample, the Companionship/Reassurance Seeking subscale was not significantly correlated with any measures, whereas in the CFA sub-sample it was significantly positively correlated with effective and avoidant coping, self vigilance, catastrophic cognitions about experiencing anxiety, and symptoms of anxiety; it was significantly negatively correlated with perceptions of control over anxiety. In the clinical sample, the Companionship/Reassurance Seeking subscale demonstrated significant positive correlations with effective and avoidant coping, anxiety sensitivity, anxiety symptoms, and general distress.

For nonclinical participants, perceived need to rely on strategies focused on Cognitive Avoidance/Disengagement was significantly positively associated with effective and avoidant coping, self-vigilance, catastrophic cognitions about experiencing anxiety, anxiety sensitivity, anxiety symptoms, and general distress, and it was significantly negatively associated with perceived control over anxiety. The results were similar in the CFA sub-sample, except that no relationship was observed between this category of strategies and effective coping. In the clinical sample, perceived need to rely

on strategies focused on Cognitive Avoidance/Disengagement was significantly positively associated with avoidant coping, anxiety sensitivity, anxiety symptoms, and general distress. It was significantly negatively associated with perceived control over anxiety.

Finally, the Positive Focus/Minimization subscale demonstrated significant positive correlations in both nonclinical groups with effective and avoidant coping, self-vigilance, catastrophic cognitions about experiencing anxiety, and anxiety sensitivity; it was additionally significantly positively associated with anxiety symptoms in the CFA group. In the clinical sample, this subscale was significantly positively associated with effective coping, and it demonstrated trends for positive associations with avoidant coping, anxiety symptoms, and general distress. Perceived need to rely on Positive Focus/Minimization strategies did not a have a significant relationship with perceived control over anxiety in any of the groups.

SBI correlations with measure of anxiety symptoms and general distress vs. a measure of depressive symptoms. The 22-item SBI correlated significantly more strongly with the BAI than it did with the BDI-II in both the EFA sub-sample, $t(276) = 2.12$, $p < .05$, and the clinical sample, $t(36) = 2.92$, $p < .01$, but no significant differences in corresponding correlations were observed in the EFA sub-sample, although the relative size of the Pearson coefficients in this group was consistent with the findings in the other groups. There was a trend in the EFA sub-sample, $t(287) = 1.67$, $p < .10$, for SBI total scores to be more strongly associated with GSI scores on the SCL-90-R than with BAI scores. No differences in the strength of association between the SBI and measures distress and anxiety were observed in the CFA sub-sample and the clinical sample.

In terms of the individual subscales, the Escape/Vigilance to Threat subscale was associated with anxiety and depression to the same extent (*t*s < 1.55, *n.s.*) in all groups; however, it was significantly more strongly associated with general distress than with anxiety in both nonclinical samples, EFA: $t(287) = 3.30$, $p < .01$, CFA: $t(276) = 2.00$, $p < .05$. In the clinical sample, this subscale had comparable associations with the BAI and the SCL-90-R: GSI.

The Companionship/Reassurance Seeking subscale had a significantly stronger correlation with the BAI than the BAI-II in the CFA sub-sample, $t(276) = 2.93$, $p < .01$, and in the clinical sample, $t(36) = 2.02$, $p < .05$. This subscale was not related to either measure in the EFA group. Companionship/Reassurance Seeking was related to anxiety and general distress to the same extent in all groups (*t*s < .73, *n.s.*).

The Cognitive Avoidance/Disengagement subscale was significantly more strongly correlated with the BAI than the BDI-II in the clinical sample, $t(36) = 3.10$, $p < .01$, but not in the nonclinical groups (*t*s < 1.22, *n.s.*). This subscale was significantly more strongly associated with general distress than with anxiety in the CFA sub-sample, $t(276) = 2.12$, $p < .05$, but there was no difference in correlations in the EFA and clinical groups (*t*s < 1.22, *n.s.*)

The Positive Focus/Minimization subscale had a significantly stronger correlation with the BAI than the BAI-II in both the EFA, $t(287) = 2.73$, $p < .01$, and CFA, $t(276) = 2.05$, $p < .05$, groups, and there was a trend in the same direction in the clinical sample, $t(36) = 1.84$, $p < .10$. This subscale was equally associated with anxiety and general distress in all of the groups (*t*s < .81, *n.s.*).

Given that the full scale SBI and the Escape/Vigilance to Threat and Cognitive Avoidance/Disengagement subscales were more strongly associated with general distress than with anxiety for nonclinical participants, follow-up analyses were conducted to evaluate whether there were differences between nonclinical and clinical samples in terms of correlations between general distress and anxiety. These differences were tested with Fisher's Z test of independent correlations. The results demonstrated that the strength of association between general distress and anxiety was significantly greater in the clinical sample than in the CFA sub-sample ($p < .05$); the same analysis in the EFA sub-sample failed to reach significance ($p = .11$), although the difference in the Pearson coefficients was in the expected direction. This finding suggests that general distress and anxiety are not as closely linked among healthy individuals as they are among anxious individuals, which might explain why, in the absence of clinically significant anxiety, general distress correlates more strongly with the SBI and some of its subscales.

SBI correlations with measures of catastrophic cognitions vs. anxiety symptoms. As I expected that higher scores on the SBI would be particularly strongly linked with catastrophic cognitions, I examined whether they were more strongly correlated with ACQ scores than with BAI scores. This analysis was only conducted for the nonclinical groups, as the ACQ was not administered to clinical participants. The results demonstrated that the full scale SBI was indeed more strongly associated with catastrophic cognitions about experiencing anxiety than with general symptoms of anxiety, with a significant difference in correlations in the EFA group, $t(287) = 2.61$, $p < .01$, and a trend for a difference in the CFA group, $t(287) = 1.64$, $p < .10$. Two of the subscales showed the same pattern of results in the EFA group, specifically the Escape/

Vigilance to Threat subscale, $t(287) = 4.59$, $p < .001$, and the Cognitive Avoidance/ Disengagement subscale, $t(287) = 2.31$, $p < .05$. None of the subscales in the CFA group differed in their relationship with catastrophic cognitions and anxiety.

SBI correlations with measures of effective coping vs. avoidant coping vs. self-vigilance. To evaluate the extent to which SBI scores are associated with different types of anxiety coping strategies, their correlations with the subscales of the CAQ were compared. It was anticipated that higher scores on the SBI would be most weakly associated with effective coping.

Comparisons of correlations of the full scale SBI and its subscales with effective and avoidant coping revealed a consistent pattern of results across all three participant groups. The full scale SBI was significantly more strongly correlated with the avoidant coping subscale than the effective coping subscale, EFA group: $t(287) = 3.17$, $p < .01$, CFA group: $t(276) = 5.56$, $p < .001$, clinical group: $t(36) = 2.59$, $p < .01$. The Escape/Vigilance to Threat subscale of the SBI was also significantly more strongly associated with avoidant than effective coping, EFA group: $t(287) = 4.92$, $p < .001$, CFA group: $t(276) = 6.11$, $p < .001$, clinical group: $t(36) = 4.26$, $p < .001$, as was the Cognitive Avoidance/Disengagement subscale, EFA group: $t(287) = 5.22$, $p < .001$, CFA group: $t(276) = 9.54$, $p < .001$, clinical group: $t(36) = 43.92$, $p < .001$. One additional significant difference was observed in the EFA group, whereby the Positive Focus/Minimization subscale was more strongly associated with effective than avoidant coping, $t(287) = 2.18$, $p < .05$. There were no significant differences in correlations for the remaining subscales (ts < .97, *n.s.*).

In terms of the SBI's associations with effective coping and self-vigilance, there were no significant differences in the clinical sample (*t*s < 1.42, *n.s.*), whereby the full scale SBI and all four subscales demonstrated comparable moderate correlations with these coping strategies. In both nonclinical groups, Cognitive Avoidance/Disengagement was more strongly associated with self-vigilance than effective coping, with a trend in the EFA group, $t(287) = 1.65$, $p < .10$, and a significant difference in the CFA group, $t(276) = 2.83$, $p < .01$. In the EFA group, there was further a trend for Positive Focus/ Minimization to be more strongly associated with effective than avoidant coping, $t(287) = 1.67$, $p < .10$, and in the CFA group, Escape/Vigilance to Threat was more strongly associated with self-vigilance than effective coping, $t(276) = 3.15$, $p < .01$. No other significant differences in correlations of the SBI subscales and these particular coping strategies were observed in the nonclinical sample (*t*s < 1.37, *n.s.*).

All three participant groups demonstrated an identical pattern of results when the SBI's relationship with avoidant coping and self-vigilance was compared. Its association with avoidant coping was significantly stronger than its association with self-vigilance in terms of full scale scores, EFA group: $t(287) = 3.57$, $p < .001$, CFA group: $t(276) = 4.11$, $p < .05$, clinical group: $t(36) = 2.59$, $p < .001$, and in terms of the Escape/Vigilance to Threat subscale, EFA group: $t(287) = 4.81$, $p < .001$, CFA group: $t(276) = 3.46$, $p < .001$, clinical group: $t(36) = 2.57$, $p < .05$, and the Cognitive Avoidance/Disengagement subscale, EFA group: $t(287) = 3.48$, $p < .001$, CFA group: $t(276) = 7.19$, $p < .001$, clinical group: $t(36) = 3.55$, $p < .001$. No significant differences were observed for the other two subscales (*t*s < 1.50, *n.s.*).

Discussion

This study aimed to develop and evaluate a novel self-report measure of safety behaviour. In an effort to address the limitations of the few existing safety behaviour measures, the SBI was developed to be applicable across the anxiety disorders and to assess an aspect of the intended use of the behaviour. This preliminary psychometric analysis of the SBI also aimed to contribute empirically to the ongoing discussion about differences between safety behaviour and adaptive coping strategies.

Several factor solutions of the original 52-item SBI were examined in EFA, and a four-factor solution was determined to be the most conceptually meaningful and parsimonious. Identified categories of strategies used in anxiety-provoking situations focused on escape and vigilance to external threat, reliance on others for company and reassurance, cognitive avoidance and disengagement from the situation, as well as emphasis on more pleasant aspects of the situation and minimization of threat.

The four-factor structure of the SBI was validated with CFA. Most fit indices for both the first- and second-order model were within the acceptable range. Although the second-order model demonstrated a slightly poorer fit, characteristics of the individual subscales suggest that summing all items to produce a 22-item total SBI score might be the most appropriate scoring method until further research is conducted on the reliability and validity of this measure and on the most optimal way of scoring it. In both nonclinical and clinical samples, the full scale SBI demonstrated good internal consistency and discriminated between nonclinical and clinically anxious participants, the latter who endorsed a significantly greater perceived necessity of relying on the strategies represented in the scale. The Escape/Vigilance to Threat and Cognitive Avoidance/

Disengagement subscales were found to be psychometrically sound and could thus be scored independently to evaluate whether the categories of strategies they represent are being used in a maladaptive way. However, the Companionship/Reassurance Seeking and Positive Focus/Minimization subscales failed to consistently discriminate between nonclinical and clinical participants. The latter subscale was also found to have less than acceptable internal consistency and, within both models, it had the least salient item loadings.

In the clinical sample, the full scale SBI demonstrated good convergent validity in terms of its positive association with symptoms of anxiety and general distress, as well as good divergent validity in terms of its relatively weaker association with symptoms of depression. Cuming et al. (2009) reported similar results regarding their safety behaviour measure for social anxiety; however, unlike in the current study, they also observed that their measure had significantly lower correlations with stress than with symptoms of social anxiety. The specificity of their anxiety measures and clinical sample compared to the BAI and the greater breadth of anxiety diagnoses in the current study might account for this difference.

The SBI subscales demonstrated similar convergent and divergent validity as the total scale with measures of anxiety and depression, respectively. The Escape/Vigilance to Threat subscale was an exception; it did not demonstrate divergent validity in terms symptoms of depression, as it was equally associated with the BAI and BDI-II. This finding is somewhat surprising as escape from anxiety provoking-situations and hypervigilance are among the hallmarks of pathological anxiety (Barlow, 2002). The observed equivalence between anxious and depressive symptoms is inconsistent with

Kamphuis and Telch's (1998) observation that the escape subscale of their safety behaviour measure was not significantly associated with depression. Furthermore, within the nascent literature on safety behaviour in depression, Moulds and colleagues (2008) found that dysphoric individuals most frequently used cognitive distraction to cope with intrusive memories. Escape was not among the categories of safety behaviours that they observed, which included memory and emotion suppression, cognitive distraction, behavioural distraction, and use of alcohol or drugs.

Findings from the nonclinical sub-samples were more varied although they largely corresponded with the clinical data. A notable exception was that for nonclinical participants, the SBI and some of the subscales were more strongly associated with general distress than with anxiety. I followed up this finding with a visual inspection of nonclinical participants' responses to the question regarding what situation they had in mind while completing the SBI. Common responses included situations such as break-ups with romantic partners, writing or studying for exams, and arguments with friends. By contrast, clinically anxious participants' responses more consistently included situations commonly deemed problematic by anxiety sufferers, such as being in confined spaces, attending social events, and taking public transportation. Although the types of situations endorsed by students could be anxiety-provoking, they appear to be more reflective of general distress. It is possible that these constructs are somewhat distinct in a healthy student population, whereas we would expect that clinically anxious individuals' experience of anxiety would be more closely related to distress. Indeed, the results indicated that the association between general distress and anxiety was significantly greater in the clinical sample than in the CFA sub-sample, with a parallel pattern of

results in the EFA sub-sample, although it did not reach significance. Thus, it appears that nonanxious individuals might endorse certain strategies as being absolutely essential to their ability to endure highly distressing situations, whereas the same type of endorsement among anxious individuals would more readily apply to anxiety-provoking situations.

A notable difference emerged between the two nonclinical sub-samples, with a total absence of significant correlations between the Companionship/Reassurance Seeking subscale and all other measures in the EFA group, by contrast to significant associations between this subscale and anxiety coping strategies, perceptions of anxiety control, negative beliefs about experiencing anxiety, and anxiety symptoms in the CFA group. This finding is unexpected and is possibly an artifact of randomization.

Total SBI scores, as well as scores on the Escape/Vigilance to Threat and Cognitive Avoidance/Disengagement subscales, were found to be negatively correlated with perceived control over anxiety and positively correlated with anxiety sensitivity in both nonclinical and clinical samples. These findings are consistent with those of Kamphuis and Telch (1998), who observed an inverse relationship of perceived coping ability with the frequency of use of agoraphobic avoidance, stress avoidance, somatic arousal avoidance, and escape to manage panic and anxiety symptoms. The authors also found that anxiety sensitivity was positively associated with the aforementioned forms of avoidance, as well as distraction. In the current study, the Companionship/Reassurance Seeking and Positive Focus/Minimization subscales were not as strongly associated with perceptions anxiety control and anxiety sensitivity. While Kamphuis and Telch's measure of safety behaviour does not include similar subscales, it is notable that their subscale of

relaxation techniques was not associated with perceived coping and anxiety sensitivity. This subscale corresponds most closely to the Positive Focus/Minimization SBI subscale, although there are conceptual differences between them.

The findings also provide preliminary evidence that scores on the full scale SBI are more strongly associated with catastrophic cognitions about experiencing anxiety than with symptoms of anxiety. These results further support the construct validity of the measure and are consistent with previous observations that use of safety behaviour is meaningfully related to catastrophic beliefs (Salkovskis et al., 1996). However, data in this case was only collected from the nonclinical sample, and these findings thus need to be replicated with clinically anxious participants. In addition, the subscales did not strongly evidence a distinction in their association with anxious cognitions and anxiety, which requires further investigation. One possible reason for this is that the ACQ focuses on cognitions about agoraphobia and panic, which may not be of high relevance for the categories of strategies represented by the SBI. Of note, in the EFA sub-sample, the Escape/Vigilance to Threat and the Cognitive Avoidance/Disengagement subscales were more strongly associated with the ACQ than the BAI. Agoraphobic and panic cognitions are conceptually consistent with the content of these subscales.

Examination of the SBI's strength of association with three different categories of anxiety coping strategies provided further support for its construct validity. The general perception that anxiety-provoking situations could not be endured without the use of strategies on the SBI was more strongly associated with avoidant than effective coping. Moreover, as would be expected, Escape/Vigilance to Threat and Cognitive Avoidance/ Disengagement were also more closely associated with avoidant coping and self-

vigilance than effective coping, and in terms of the former two coping strategies, they were more closely associated with avoidant coping than self-vigilance.

Overall, this study offers a novel conceptualization of the assessment of safety behaviour. Additional strengths include the use of both exploratory and confirmatory factor analyses in the development of the SBI, the use of specific statistical methods to account for the nonnormal distribution of data, and the preliminary validation of the SBI in a clinical sample. Several limitations also warrant discussion.

First, it appears that the Companionship/Reassurance Seeking and Positive Focus/Minimization subscales are performing somewhat differently than the other two SBI subscales. For example, the Positive Focus/Minimization subscale was found to be more closely associated with effective coping than with avoidant coping and self-vigilance. Thus, perceptions that strategies included on this subscale are absolutely essential to one's ability to cope with anxiety do not appear to be necessarily maladaptive. Some support for this hypothesis is obtained from the failure of this subscale, as well as the Companionship/Reassurance Seeking subscale, to distinguish between nonclinical and clinical participants. An alternative interpretation, particular to convergent validity of the Positive Focus/Minimization subscale with effective coping, is based on closer inspection of the CAQ effective coping subscale, which includes items such as, "I try to ignore any anxiety symptoms I may be experiencing" and "I try not to think about how I am feeling" (Hughes et al., 1999). Such strategies may indeed be maladaptive when viewed as being indispensable in anxiety-provoking situations. Future research on the SBI must focus on further validation of its subscales. Importantly, as

noted by Tracy (1990), factor interpretations should be viewed as hypotheses that need to be tested with a variety of research methods.

The initial 52-item SBI included a broad selection of strategies that represented those used across a range of anxiety disorders. However, the markedly reduced 22-item version is clearly more restricted in its survey of strategies and may not optimally assess types of safety behaviour common to specific anxiety disorders (e.g., self-vigilance). This limitation is shared by other self-report measures of safety behaviour, as it is not possible for such tools to fully capture every category of this highly idiosyncratic behaviour. To this extent, interview-based methods of assessment offer an advantage in their capacity for thoroughness. The interviews that have been reported in the safety behaviour literature, however, are of unknown psychometric properties (Abramowitz & Moore, 2007; Kim, 2005; McManus, et al., 2008; Taylor *&* Alden*,* 2010).

The extracted factors accounted for approximately 45% of variance, leaving more than half of the variance unexplained. Similar findings have been reported in other factor analytic studies of self-report measures of safety behaviour (e.g., Cuming et al., 2009). Compared to CPA, which analyzes total variance, PAF analyzes only shared variance and thus provides a more conservative (but more accurate) estimate of variance accounted for. Nevertheless, additional investigations of the SBI's factor structure are needed to evaluate whether alternative factor solutions might account for a greater amount of variance.

A related limitation is that analyses that determined items to be retained for the 22-item SBI were based on a nonclinical convenience sample of undergraduate students, and it is possible that discarded items might have performed differently in a sample of

clinically anxious participants. I expected that differences between anxious and nonanxious individuals would be reflected in differences in perceived necessity for use of strategies, which I observed, and not necessarily in the types of strategies used. I cannot, however, rule out that certain strategies might rarely be implemented by nonanxious individuals or that a different factor structure might be derived from the data of clinically anxious participants.

As noted above, student participants appeared often to reference experiences of general distress rather than anxiety when completing the SBI. It is possible that this is the reason that Companionship/Reassurance Seeking and Positive Focus/Minimization were part of the final factor solution and that they appeared to have adaptive aspects even when rated highly. Future research of the SBI with clinically anxious participants is essential to determine whether this factor structure is valid in a clinical population. I am presently collecting data from a large mixed anxiety sample, which will facilitate further factor analysis of the original 52-item SBI.

This study lays the preliminary groundwork for future investigations of a novel measure of safety behaviour, which are necessary before it can be implemented in clinical practice. The use of psychometrically sound assessment tools is essential for the further refinement of our understanding of the distinctions between adaptive and maladaptive coping behaviour in anxiety disorders.

CHAPTER 7

General Discussion

This program of research had several objectives. Broadly, it aimed to examine the role of safety behaviour in cognitive-behavioural treatments for anxiety disorders. Given discrepancies in the existing literature regarding whether safety behaviour facilitates or hinders treatment outcome (Parrish et al., 2008; Rachman et al., 2008), this work was developed to contribute to discussion on possible reasons for these discrepancies and to clarify under which circumstances use of safety behaviour during treatment might be beneficial. In line with this goal, three studies were conducted, each with distinct methodology, to address gaps in current knowledge. The studies focused on evaluating the effect of safety behaviour on belief change during a cognitively-focused exposure session, on examining whether judicious incorporation of safety behaviour into exposure-based treatments has the potential to improve treatment acceptability, and on developing a conceptually and psychometrically sound instrument for assessing safety behaviour.

Summary of Findings

Study 1. In this study, an experimental paradigm was used to investigate whether use of protective safety gear during a brief belief testing session (i.e., behavioural experiment) for spider fear would impact the degree of change in negative spider-related beliefs. Previous research has pitted safety behaviour use during treatment against conditions of encouraged cognitive reappraisal (Sloan & Telch, 2002), whereas this study investigated the pairing judicious safety behaviour use with cognitive reappraisal, which has the potential to facilitate belief change.

The main results demonstrated robust and comparable post-session declines in negative beliefs both for participants who used and who did not use safety gear. Thus, in support of Rachman et al.'s (2008) hypothesis, the use of safety gear did not preclude cognitive change. The two groups similarly benefited from equal improvements on indices of fear and self-efficacy. Participants in the safety gear condition demonstrated a closer distance of approach to the spider and bolder belief testing behaviour during the behavioural experiment. However, compared to the control group, they experienced a lesser increase in perceived control between the baseline assessment and an assessment conducted immediately after the behavioural experiment. It is possible that their bolder approach behaviour during the session negatively impacted their sense of control or that the offer of safety gear signalled to them that the session would be unmanageable.

In all, spider fearful participants' use of safety gear during a behavioural experiment did not impair the extent to which they benefited from disconfirmatory information but it also did not confer an advantage over not using safety gear. These results are consistent with those from several recent studies in this area (Deacon et al., 2010; Hood et al., 2010; Milosevic & Radomsky, 2008), and they diverge from findings demonstrating the negative effects of safety behaviour use on cognitive change (e.g., Kim, 2005; Salkovskis et al., 1999).

Study 2. This vignette-based study examined treatment acceptability as a function of safety behaviour use and treatment rationale in samples of nonclinical and clinically anxious participants. The main focus of this research was to conduct a preliminary evaluation of Rachman et al.'s (2008) hypothesis that the judicious use of safety behaviour has the potential to improve the acceptability of exposure-based treatments.

This is the first study in the safety behaviour literature that has focused specifically on assessment of treatment acceptability. Measures of endorsement, adherence, and discomfort were used as indicators of acceptability. Strengths of this work include assessment of treatment acceptability based on descriptions of a full course of treatment, by contrast to experimental studies in which such assessment was based on brief exposure trials conducted within a single session (Deacon et al., 2008). Furthermore, effort was made to control for a confound present in many previous safety behaviour studies, which paired different treatment rationales with safety behaviour and exposure only conditions (e.g., McManus, Sacadura, & Clark, 2008; Salkovskis et al., 1999; Sloan & Telch, 2002, Wells et al., 1995).

The findings of this study showed that vignettes describing use of safety behaviour in the early stages of exposure-based treatment with subsequent fading (i.e., judicious use) received higher ratings of acceptability compared to vignettes describing discouraged use of safety behaviour during treatment. Additionally, a cognitive rationale was endorsed as being more acceptable than an extinction rationale, and treatment incorporating judicious safety behaviour use under a cognitive rationale received the highest preference rank. Comparable results were obtained from nonclinical and clinical participants. These findings provide preliminary support for Rachman et al.'s (2008) hypothesis that safety behaviour has the potential to make exposure-based treatment more acceptable and to reduced the number of refusers and drop-outs.

Study 3. The purpose of this study was to develop and evaluate a self-report measure, the Safety Behaviour Inventory (SBI), that assesses the use of safety behaviour by anxious individuals. Although several measures of safety behaviour have been

published (e.g., Hughes et al., 1999; Kamphuis & Telch, 1998), they appear to be infrequently used in safety behaviour studies, with researchers instead choosing to rely on informal questionnaires and interviews with unknown psychometric properties. As existing measures are grounded in topological assessment, they offer no potential for insight into the function of the behaviours they assess, making it difficult to determine whether respondents are endorsing maladaptive safety behaviour or adaptive coping strategies. Thus, the aim of Study 3 was to develop a measure of respondents' perceived need to rely on given strategies during anxiety-provoking situations. The SBI was also developed to be applicable across the anxiety disorders.

A large sample of undergraduate students was randomly split in half to facilitate exploratory and confirmatory factor analyses of the initial 52-item SBI. A four-factor structure was identified and validated, producing a 22-item item version of the measure. Based on item content, the four factors were labelled as follows: Escape/Vigilance to Threat, Companionship/Reassurance Seeking, Cognitive Avoidance/ Disengagement, and Positive Focus/Minimization.

Analyses of internal consistency reliability, discriminant validity, and construct validity were conducted based on the two student sub-samples and a smaller sample of clinically anxious participants. The full scale SBI and subscales demonstrated acceptable to good internal consistency, with the exception of the Positive/Focus Minimization subscale, which was slightly below the acceptable range. Scores on the full scale SBI and on the Escape/Vigilance to Threat and Cognitive Avoidance/Disengagement subscales discriminated between clinical and nonclinical participants. The Companionship/

Reassurance Seeking and Positive Focus/ Minimization subscales were found to have weaker discriminant validity.

In the clinical sample, SBI total and subscale scores correlated more strongly with measures of anxiety and general distress than with a measure of depression. Results from the student sub-samples were more varied although largely consistent with the clinical data. A notable exception was that for nonclinical participants, SBI scores were more strongly associated with general distress than with anxiety (in the clinical sample, there was no difference between distress and anxiety).

The results also demonstrated that in all samples, total SBI scores and scores on the Escape/Vigilance to Threat and Cognitive Avoidance/Disengagement subscales were negatively associated with perceived control over anxiety and positively associated with anxiety sensitivity. In the nonclinical sub-samples, total scores were also found to be more strongly associated with catastrophic cognitions about experiencing anxiety than with symptoms of anxiety (the cognitions measure was not administered to clinical participants). Finally, correlations of total and subscale scores with three different categories of anxiety coping strategies provided further support for the SBI's construct validity. Of note, the Companionship/ Reassurance Seeking and Positive/Focus Minimization subscales appeared to be performing somewhat differently than the other two SBI subscales based on their positive correlations with a measure effective coping and on their poor discriminant validity. Overall, findings from this study suggest that the SBI, particularly the total scale, has good internal consistency, as well as discriminant and construct validity. However, further validation of this measure in clinical samples is necessary.

Clinical Implications

The studies comprising this research program were designed with the general goal of contributing knowledge to cognitive-behavioural models and treatments of anxiety disorders. Study 1 contributes to a growing literature suggesting that safety behaviour use during treatment is not necessarily detrimental to treatment outcome. In particular, use of safety gear does not appear to impair corrective learning. Although further research in this area is necessary to justify changes to current treatment protocols, these findings challenge the practice of eliminating safety behaviour from exposure-based treatments at all costs. Possible additional benefits of safety behaviour use during exposure-based treatments are highlighted in Study 2, which suggests that incorporating safety behaviour judiciously into such treatments might make them more acceptable and tolerable, and it thereby might reduce the number of refusers and drop-outs. Finally, the novel safety behaviour measure evaluated in Study 3 has the potential to be a valuable assessment tool in clinical practice and research, although it presently requires further validation. Study 3 also highlighted the difficulties in distinguishing between safety behaviour and adaptive coping strategies and emphasized the need for further research on this topic; discussion in this area will hopefully encourage clinicians to be more vigilant to issues surrounding the assessment of maladaptive and adaptive coping behaviour reported by their clients.

Future Directions

An important area in the future study of safety behaviour relates to the development of clear operational definitions of safety and related behaviours used by anxious individuals. Salkovskis' initial formulation of *safety-seeking behaviour* identified it as "having the subjective effect of 'saving' the person from the threat involved in

anxious stimuli and situations" (p. 17). He also suggested that the difference between adaptive coping and maladaptive avoidance is the focus on anxiety reduction in the former versus avoidance of disaster in the latter. This distinction is echoed by Thwaites and Freeston (2005), who, as highlighted in the current research program, proposed that it is challenging to apply it in practice. In their unified treatment model of emotional disorders, Barlow, Allen, and Choate (2004) proposed that these disorders are maintained, in part, by maladaptive emotion regulation strategies aimed at avoiding "excessive unexpected emotional experiences" (p. 219). When applied to anxiety maintenance, this definition complements but is somewhat distinct from Salkovskis' definition of safety-seeking behaviour, which does not constrain feared outcomes to emotional events (although the two are presumably functionally related). Barlow and colleagues converge with Salkovskis on a definition of adaptive coping, in which the focus is on the reduction of anxiety and negative affect rather than on avoidance. Many current safety behaviour studies use the term safety behaviour to characterize both facilitative and hindering behaviour in the context of treatment outcome, a departure from the original definition of this behaviour as being distinctly maladaptive. Related to this, Helbig-Lang and Petermann (2010) suggest that the "positive effects of safety behavior might stem from a misclassification of behavior" (p. 230). This raises the question of whether non-detrimental safety behaviour should be termed as such or whether it might be more theoretically and clinically useful to label it as coping behaviour.

Parrish et al. (2008) also called for the need for more refined definitions of different types of safety behaviour (e.g., distraction, neutralization). In this case, there is again the possibility that these behaviours might have adaptive and maladaptive functions

in different contexts; thus, it is not necessarily useful to categorically refer to them as safety behaviour. Overall, in the absence of consensus on operational definitions of these constructs, refinements of theoretical models of anxiety are hindered. Likely, the most constructive definitions with incorporate multiple aspects associated with given behaviour, such as situational and cognitive triggers for the behaviour, rigidity in adherence to the behaviour across different situations, intent for its use, and the consequences of its use, the latter which might also include a temporal dimension.

As highlighted by Study 3, current attempts to understand the differences between safety behaviour and adaptive coping strategies have stressed the need to understand the function of these behaviours and the context in which they are used. Function in this case is rooted in the cognitive-behavioural model, whereby maladaptive behaviour is aimed at reducing the likelihood of feared outcomes (Salkovskis, 1991). It is possible, however, that the distinction between maladaptive and adaptive behaviour might also be clarified by understanding the underlying processes impacted by its use. For instance, Sloan and Telch (2002) have suggested that safety behaviour might impair threat disconfirmation by reducing attentional resources necessary for the processing of threat-relevant information. This hypothesis has received support from research showing that less fear reduction is achieved following exposure that includes a demanding cognitive load task compared to exposure that includes guided threat focus (e.g., Kamphuis & Telch, 2000; Telch et al., 2004). In addition, Powers et al. (2004) observed that the availability of safety aids, rather than their actual use, interferes with the outcomes of exposure treatment (Powers et al., 2004).

However, other researchers have observed that distraction during exposure treatment results in greater within- and between-trial habituation than does attentional focus (e.g., Johnstone & Page, 2004; Oliver and Page, 2003, 2008). Helbig-Lang and Petermann (2010) suggested that guided distraction might be beneficial in the case that it reduces reliance on cognitively-based safety behaviours. Partial support for this hypothesis is provided by Oliver and Page's (2008) finding that exposure plus external distraction resulted in greater fear reduction than exposure plus internal distraction. Nevertheless, both distraction conditions in this study conferred a greater advantage in post-treatment gains compared to parallel conditions of guided threat focus.

It has also been suggested that safety behaviour might increase anxiety by promoting attentional focus toward threat. This hypothesis is based on findings from experimental studies with undergraduate students, which showed that contamination-related safety behaviour increases fear of contamination (Deacon & Maack, 2008) and that health-related safety behaviour increases health anxiety (Olatunji, Etzel, Tomarken, Ciesielski, & Deacon, 2011). Distraction was not included among the safety behaviours implemented in these studies.

At present, divergent findings regarding the effects of attentional focus/ distraction on fear reduction would make it difficult to distinguish adaptive from maladaptive safety strategies based on their effects on attentional resources. Research in this area nevertheless points to the possible value of cognitive processing in making this distinction. In addition to clarifying the role of attentional focus/distraction in exposure-based treatments, future investigations should examine how use of other types of safety and/or coping behaviours during treatment affect cognitive processes.

An alternative explanation for the negative impact of safety behaviour use on disconfirmatory experiences stems from Salkovskis' (1991) original formulation of safety behaviour, which posits that anxious individuals misattribute the non-occurrence of feared outcomes to their use of the behaviour rather than to the absence of danger in the anxiety-provoking situation. Surprisingly, there has been little focus on participants' attributions in the safety behaviour literature. Indeed, Sy et al.'s (2011) recent study on the effects of safety behaviour during exposure treatment for claustrophobic fear appears to be the first in this line of research to include a measure of attribution. The authors developed a two-item instrument that requires respondents to rate on 100-point scale reasons for the nonoccurrence of their feared predictions. The response items were "because I took specific actions to prevent this from happening" and "because I knew I could take specific actions to prevent this from happening." Contrary to Salkovskis' hypothesis, Sy et al. found that "neither the use nor the availability of safety behaviors was associated with greater misattributions of safety, and misattributions of safety following the treatment were not associated with worse outcomes" (pg. 312).

Limitations of these preliminary findings include a lack of specificity about the "actions" referenced in the attributions measure. It is possible that participants were covertly using safety or coping strategies in addition to those presented in the study and that they responded to the questions with these in mind. Furthermore, this measure did not allow for the collection of data regarding other types of attributions for the non-occurrence of feared catastrophe. Presumably, participants who had low scores on this measure nevertheless had some rationale for why their negative predictions did not occur.

Further examination of participants' attributions in the context of safety behaviour manipulations is certainly warranted, as greater understanding of this core mechanism of the proposed maladaptive function of safety behaviour might elucidate under what conditions misattributions of safety are least and most likely to occur. This knowledge would contribute to future efforts to refine methods for the judicious incorporation of safety behaviour into exposure-based treatments. Should treatments be revised to include judicious safety behaviour use, they would benefit from techniques aimed at reducing the likelihood of the misattribution of safety.

In further consideration of participants' appraisals in safety behaviour studies, it has been suggested that providing participants with safety aids might paradoxically increase their perceptions of dangerousness and thus reduce the effectiveness of the aids during exposure (Deacon et al., 2010). Sy et al. (2010) assessed participants' inferences of danger based on the availability of safety aids and observed that greater endorsement of such inferences was associated with significantly poorer treatment outcomes. As the main finding of this study indicated equivalent post-treatment improvement in safety behaviour availability and utilization conditions and an exposure only condition, the authors suggested that reducing danger inferences might yield superior outcomes in the safety behaviour groups. This hypothesis needs to be tested in future research. If it is supported, methods to reduce danger inferences would also demand further investigation. This line of research might clarify, in part, why no between-group differences were observed in studies such as Study 1. Indeed, in this study, when participants in the safety gear group were initially introduced to the gear, it was not uncommon for them to make

comments such as, “On no, what will I be doing in there?!” regarding the behavioural experiment they were about to complete.

Most safety behaviour studies to date, including those from the current program of research, are characterized by the limited generalizability of their findings to a clinical context. Common reasons for this include the use of nonclinical student samples (e.g., Hood et al., 2010; Milosevic & Radomsky 2008; Powers et al., 2004) and brief durations of exposure sessions (e.g., Deacon et al., 2010; Sloan & Telch, 2002; Wells et al., 1995). Study 2 attempted to address the latter limitation by providing participants with a description of a full course of exposure-based treatment; however, as it used a vignette-based design, it is not possible to know whether its findings would generalize to actual treatment. There is clearly a need for more research evaluating the effects of safety behaviour under clinically representative conditions. In a recent review of the role of safety behaviour in anxiety disorders, Helbig-Lang and Petermann (2010) highlighted the relative paucity of this type of research in therapeutic contexts. They noted that existing studies in this area generally support the elimination of safety behaviour from treatment. As discussed in Study 1, however, an important limitation of much of this work (e.g., McManus et al., 2008; Salkovskis et al., 1999) is the inclusion of unmatched treatment rationales within the safety behaviour manipulation.

Furthermore, the long-term effects of safety behaviour use in exposure-based treatments are not known, as most studies in this domain either have not included follow-up assessments (e.g., Milosevic & Radomsky, 2008; Sy et al.2011) or they implemented such assessments within a short-term period (e.g., 2 weeks: Sloan & Telch, 2002; 1 week: Deacon et al., 2010; Hood et al., 2010). As an exception, earlier work on the use of

escape-based safety behaviour in treatment included a 3-month follow-up assessment and showed that treatment gains were maintained (Rachman et al., 1986). Future clinical research of safety behaviour would benefit from inclusion of follow-up assessments. Given evidence that safety behaviour may not necessarily exert detrimental effects in exposure-based treatments, it would be particularly valuable to determine whether the gains achieved under conditions of safety behaviour use are maintained in the longer term. Conversely, for conditions in which safety behaviour was eliminated (i.e., in standard exposure treatment), follow-up assessments should focus on whether reduction of safety behaviour is maintained.

Although the concept of safety behaviour has been developed within cognitive-behavioural models of anxiety disorders, investigation of safety behaviour in other disorders may prove fruitful, as it has important implications for treatment. To date, preliminary studies have focused on the identification (Harvey, 2002), assessment (Ree & Harvey, 2004), and function (Hood et al., in press) of safety behaviour in insomnia, on the use of safety behaviour to manage intrusive memories in depression (Moulds et al., 2008), on the role of safety behaviour in hypochondriasis (Abramowitz & Moore, 2007; Olantunji et al., in press), and on its role in the maintenance of persecutory delusions (Freeman, Garety, & Kuipers, 2001) and hallucinations (Morris, 1998) and in the misinterpretation of intrusions in psychosis (Morris, 2001). This research demonstrates that safety behaviour is not a phenomenon unique to anxiety disorders. As exposure strategies are not necessarily used in the treatment of non-anxiety-based psychological problems in which safety behaviour has been observed, future research should examine

whether safety behaviour exerts similar effects in such treatments as it does in exposure-based treatments.

Endnotes

[1] For these repeated measures analyses, the condition of sphericity had not been met, thus the Greenhouse-Geisser correction for nonsphericity was applied.

[2] Not all approach behaviour during the behavioural experiment was codable on the standardized 33-point hierarchy, as participants were allowed to move freely about the room. Because of this, the analysis of change in distance of approach must be interpreted with caution, as it represents only 75% of the sample.

[3] Other analogue studies of treatment preference, however, have demonstrated higher preference ranks for exposure therapy than cognitive-behaviour therapy (e.g., Becker, Darius, & Schaumberg, 2007).

[4] The Treatment Preference Form permitted the same preference rank to be assigned to more than one treatment. Most participants in each sample, however, provided four distinct ranks (i.e., first, second, third, and fourth) for the described treatments (98% in student sample; 91% in clinical sample).

[5] Although this study was not developed for the purpose of comparison between the two samples, additional analyses were conducted to determine the generalizability of treatment perceptions from a nonclinical population to clinically anxious individuals. A series of one-way ANOVAs were conducted for each of three acceptability measures across the four vignettes, with clinical status as a between-group factor. Compared to student participants, clinically anxious participants provided significantly lower adherence ratings, $F(1, 467) = 4.77$, $p < .05$, $\eta^2 = .01$, and higher ratings of anticipated discomfort , $F(1, 467) = 4.68$, $p < .05$, $\eta^2 = .01$, for treatment involving judicious safety behaviour under a cognitive rationale. A Wilcoxon Rank sum test was conducted to

evaluate group differences in treatment preference ranks. There was a trend for student participants to rank the treatment of discouraged safety behaviour under an extinction rationale more highly than clinical participants for, $z = -1.77$, $p = .08$. Thus, although participants from both samples largely had similar views of the treatment descriptions, participants with an anxiety disorder provided more conservative responses.

[6] For all independent samples *t*-tests for differences between participant characteristics in student and clinical samples, Levene's test indicated unequal variances; thus, the degrees of freedom were adjusted.

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Appendix A

Screening Measure for Spider Fear

Fear and Anxiety Lab Questionnaire

Below are several different stimuli that can cause fear in people. Please circle the number that best represents how fearful you are of each stimulus.

	None	Very little fear	A little fear	Some fear	Much fear	Very much fear	Terror
1. Sharp objects	0	1	2	3	4	5	6
2. Blood	0	1	2	3	4	5	6
3. Spiders	0	1	2	3	4	5	6
4. Deep water	0	1	2	3	4	5	6
5. Enclosed spaces	0	1	2	3	4	5	6
6. Snakes	0	1	2	3	4	5	6
7. Heights	0	1	2	3	4	5	6
8. Dentists	0	1	2	3	4	5	6

Appendix B

Hierarchy for Exposure to Spider

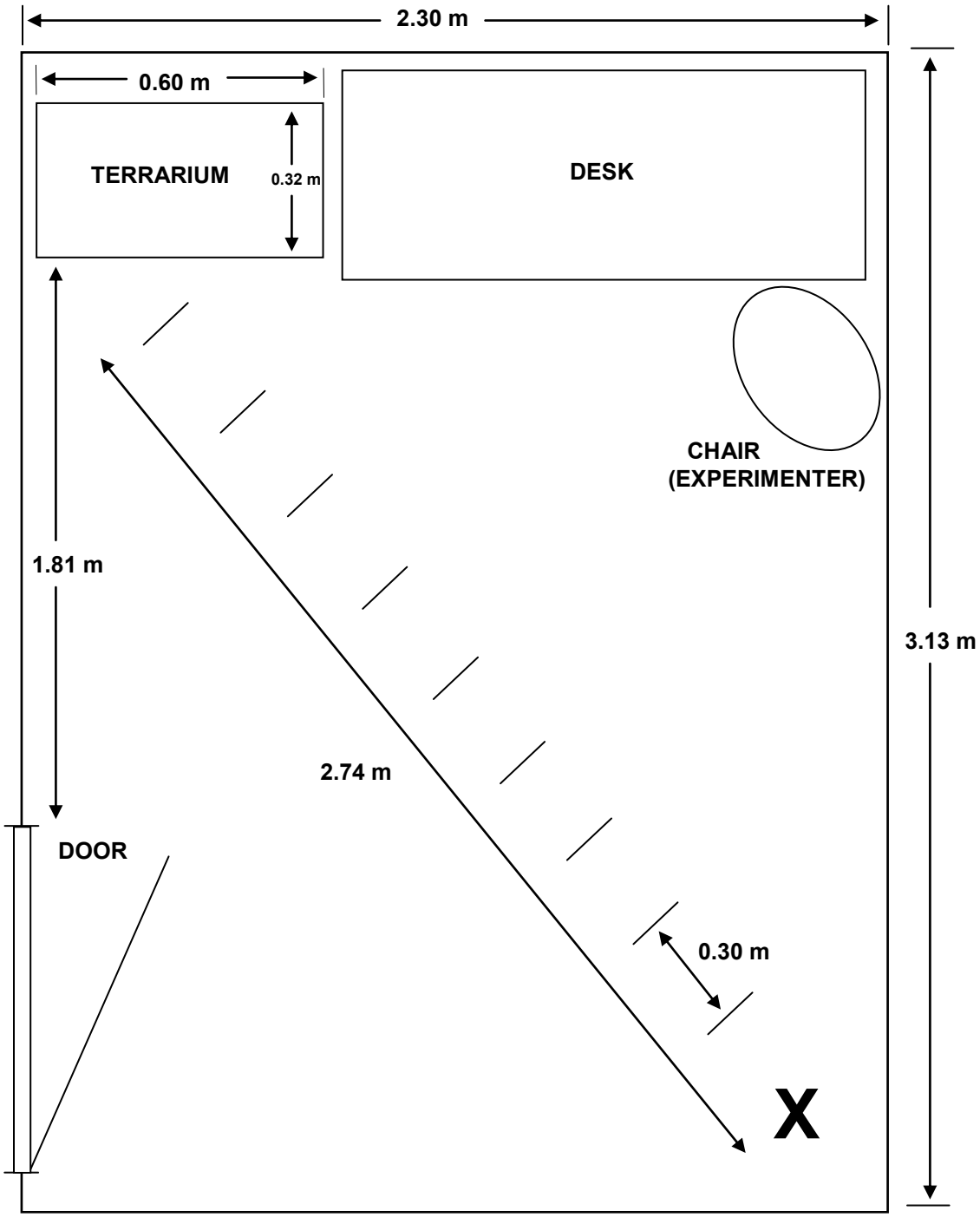
1. Standing just outside the room that the spider is in, with the door closed.
2. Standing at the doorway of the room that the spider is in, with the door open.
3. Standing inside the room that the spider is in at the farthest point from the container (9 feet).
4. 8 feet away from the container.
5. 7 feet away from the container.
6. 6 feet away from the container.
7. 5 feet away from the container.
8. 4 feet away from the container.
9. 3 feet away from the container.
10. 2 feet away from the container.
11. 1 foot away from the container.
12. Standing beside the container.
13. Touching the outside of the container.
14. Peering closely into container, at eye level.

➔ **Lid off**

15. Standing just outside the room that the spider is in, with the door closed.
16. Standing at the doorway of the room that the spider is in, with the door open.
17. Standing inside the room that the spider is in at red X (9 feet).
18. 8 feet away from the container.
19. 7 feet away from the container.
20. 6 feet away from the container.
21. 5 feet away from the container.
22. 4 feet away from the container.
23. 3 feet away from the container.
24. 2 feet away from the container.
25. 1 foot away from the container.
26. Standing beside the container.
27. Touching the outside of the container.
28. Peering closely into container, at eye level.
29. Touching inside the container (but not touching the spider).
30. Touching the bottom of the container (but not touching the spider).
31. Touching the spider with one finger, while spider is still inside container.
32. Touching spider, while spider is outside of container.
33. Holding the spider.

Appendix C

Exposure Room Layout



Appendix D

Protective Gear Offered To Participants in the Safety Gear Group

1. Protective head cover #1
2. Protective head cover #2
3. Safety goggles
4. Safety trousers
5. Safety jacket
6. Mesh safety jacket
7. Gloves #1 (long)
8. Gloves #2 (short)
9. Latex/surgical gloves
10. Yellow rubber gloves
11. Knee protectors
12. Lower leg protectors
13. Shoe covers
14. Protective apron

Appendix E

Description of the Purpose of the Study Presented to Participants

Introduction

We are currently investigating a psychological intervention that will be applicable to a broad range of anxiety disorders. An important part of its development involves better understanding what individuals think of this treatment and how likely they might be to receive it for their fear or anxiety.

Although you may or may not currently suffer from an anxiety disorder, we would like you to imagine how you might respond if you were a potential candidate for this treatment (i.e., if you had an anxiety problem that needed treating).

The following pages contain a detailed description of the therapy and its options, each followed by questionnaires about your responses to it.

We would like your honest opinion, and there is no right or wrong answer.

Please read each description carefully, as there may be subtle differences between the treatment options.

Appendix F

General Description of Exposure Treatment Presented to Participants

General Treatment Description

Imagine that you have decided to seek professional help for an enduring problem with fear or anxiety (e.g., public speaking, injections, being in crowded places, panic attacks, etc.), which has been causing you distress and has interfered with your daily activities. You have been coping with it by avoiding the feared object/situation as much as possible.

You receive a referral to an anxiety disorders clinic, and during your first appointment, you are informed that treatment involves approximately 16 weekly 50-minute sessions with a psychologist, and that one of its key components is gradual exposure to your feared object/situation. You learn also that this type of treatment has a very good success rate if you adhere to it and complete all of the sessions and exercises.

During the exposure treatment, you will be required to repeatedly and systematically confront the object/situation that has been making you anxious. Together with the psychologist, you will develop a hierarchy of scenarios that represent progressively more difficult encounters with your feared object/situation. Thus, you will begin by confronting the least threatening scenario on your hierarchy (e.g., in the case of dog phobia, looking at a cartoon drawing of a dog) and work your way through intermediate steps to confront the most anxiety provoking scenario (e.g., petting a dog).

In order to customize the treatment to your specific problem and preferences, the psychologist describes to you several possible variations of the available therapy procedures, which are presented on the following pages.

Please read each treatment description carefully as there may be subtle differences between them, and keep in mind that one of these options may be the one you choose to partake in on a weekly basis for several months.

Appendix G

Treatment Vignettes Presented to Participants

When vignettes were presented to participants, they did not include the below titles and were instead titled as Treatment Option 1, 2, 3, or 4.

Judicious Safety Behaviour Use/Extinction Rationale

Although it will be challenging to confront situations that make you anxious, you will find that if you remain in such situations long enough, your anxiety will eventually decrease. Fear naturally declines the longer you remain in a threatening situation, so facing your fear will always lead to a decline in anxiety even though it might be uncomfortable to do so. You will thus be required to stay in each situation on your fear hierarchy for a pre-determined amount of time, even if your anxiety begins to escalate.

To assist you with facing your fear, if you reach an obstacle in the early part of exposure treatment, you and the therapist will collaboratively decide to use strategies/tools that might make you feel safer or less anxious. The selection of specific strategies/tools will depend on your particular anxiety problem, but they may include, for example, leaving the exposure situation if your anxiety becomes unbearable and returning to it as soon as it has declined, or you might bring to session a comforting or protective object of your choosing. The use of such strategies/tools during the early stages of treatment has the potential to promote fear reduction and to increase your sense of control. However, once you have advanced to later stages of the treatment, you will work with the therapist on phasing them out, so that you can complete the exposure exercises without any assistance.

To summarize, in this intervention you will be required to face your fear repeatedly for set periods of time with the assistance of strategies/tools that might make you feel less anxious.

Discouraged Safety Behaviour Use/Extinction Rationale

Although it will be challenging to confront situations that make you anxious, you will find that if you remain in such situations long enough, your anxiety will eventually decrease. Fear naturally declines the longer you remain in a threatening situation, so facing your fear will always lead to a decline in anxiety even though it might be uncomfortable to do so. You will thus be required to stay in each situation on your fear hierarchy for a pre-determined amount of time, even if your anxiety begins to escalate.

To assist you with facing your fear, even if you reach an obstacle in the early part of exposure treatment, the therapist will very strongly discourage you from using strategies/tools that that you normally rely on to feel safer or less anxious. These strategies/tools will depend on your particular anxiety problem, but they may include, for example, leaving a situation if your anxiety becomes unbearable or carrying with you a comforting or protective object. It has been proposed that the use of such strategies/tools

during exposure therapy might interfere with long-term fear reduction. Therefore, each session will always take the same format; the therapist will ensure that all exposure exercises are conducted without any assistance from what you usually use to feel safer or less anxious.

To summarize, in this intervention you will be required to face your fear repeatedly for set periods of time without the assistance of strategies/tools that might make you feel less anxious.

Judicious Safety Behaviour Use/Cognitive Rationale

Although it will be challenging to confront situations that make you anxious, exposure to such situations will help you learn useful information. You will realize the unlikelihood that something terrible will happen, and that if it did happen, that you are able to cope much better than you might have predicted . You would also learn that you can in fact manage your fear in a threatening situation. You will thus be required to focus on obtaining information to change your negative and probably irrational beliefs.

To assist you with facing your fear, if you reach an obstacle in the early part of exposure treatment, you and the therapist will collaboratively decide to use strategies/tools that might make you feel safer or less anxious. The selection of specific strategies/tools will depend on your particular anxiety problem, but they may include, for example, leaving the exposure situation if your anxiety becomes unbearable and returning to it as soon as it has declined, or you might bring to session a comforting or protective object of your choosing. The use of such strategies/tools during the early stages of treatment has the potential to promote fear reduction and to increase your sense of control. However, once you have advanced to later stages of the treatment, you will work with the therapist on phasing them out, so that you can complete the exposure exercises without any assistance.

To summarize, in this intervention you will be required to obtain useful information to challenge irrational beliefs, often by facing your fear, with the assistance of strategies/tools that might make you feel less anxious.

Discouraged Safety Behaviour Use/Cognitive Rationale

Although it will be challenging to confront situations that make you anxious, exposure to such situations will help you learn useful information. You will realize the unlikelihood that something terrible will happen, and that if it did happen, that you are able to cope much better than you might have predicted . You would also learn that you can in fact manage your fear in a threatening situation. You will thus be required to focus on obtaining information to change your negative and probably irrational beliefs.

To assist you with facing your fear, even if you reach an obstacle in the early part of exposure treatment, the therapist will very strongly discourage you from using strategies/tools that that you normally rely on to feel safer or less anxious. These strategies/tools will depend on your particular anxiety problem, but they may include, for example, leaving a situation if your anxiety becomes unbearable or carrying with you a

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To summarize, in this intervention you will be required to obtain useful information to challenge irrational beliefs, often by facing your fear, without the assistance of strategies/tools that might make you feel less anxious.

Appendix H

52-Item Safety Behaviour Inventory

SBI

Imagine a recent situation that made you anxious or fearful**. Then, indicate how essential each of the below strategies was to your ability to endure this situation.** ***If you did not use a given strategy at all, write a "0" (zero) as your response for that item.***

How essential was each strategy in helping you to endure the situation?

0	**-------- 1 ---------- 2 ---------- 3 ---------- 4 ---------- 5 ---------**				
Did not use.	**Not at all essential.** Could have endured situation without it.		**Somewhat essential.** Could have endured situation without it but with some difficulty.		**Extremely essential.** Could <u>not</u> have endured situation without it.

_____ 1. I pretended not to be there.

_____ 2. I stood very still.

_____ 3. I focused on more pleasant aspects of the situation.

_____ 4. I physically left the situation as soon as it was possible.

_____ 5. I relied on a comforting object.

_____ 6. I controlled my breathing.

_____ 7. I closed my eyes or looked away.

_____ 8. I thought of pleasant/calming images.

_____ 9. I planned my escape route.

_____ 10. I scanned the environment for additional threats.

_____ 11. I physically removed the threat.

_____ 12. I relied on a protective object .

_____ 13. I recited a comforting mantra, prayer, or song.

_____ 14. I avoided being seen by others.

_____ 15. I asked someone to physically remove the threat.

_____ 16. I took medication.

_____ 17. I consumed alcohol and/or another substance.

_____ 18. I checked the presence of escape routes.

_____ 19. I monitored my bodily reactions.

_____ 20. I positioned myself close to an escape route.

_____ 21. I mentally rehearsed my response to the situation.

_____ 22. I distracted myself with music, TV, or a book.

_____ 23. I conversed with a companion.

_____ 24. I concealed my fear or anxiety from others.

_____ 25. I made sure I wasn't alone.

_____ 26. I distracted myself by staying busy.

_____ 27. I leaned on a stable surface to support myself.

_____ 28. I paid close attention to that which was making me fearful or anxious.

_____ 29. I asked someone for reassurance.

_____ 30. I focused my gaze on something else.

_____ 31. I tried to ignore my bodily reactions.

_____ 32. I moved about very slowly.

_____ 33. I tried to undo/cancel my thoughts.

_____ 34. I made myself numb.

_____ 35. I reassured myself.

_____ 36. I laid down or sat down.

_____ 37. I called 911 or went to the hospital.

_____ 38. I counted to 10.

_____ 39. I lit a cigarette.

_____ 40. I checked that things are ok.

_____ 41. I tried to control myself.

_____ 42. I called somebody.

_____ 43. I had a drink of water.

_____ 44. I went for a walk.

_____ 45. I told myself it was nothing.

_____ 46. I imagined myself in a safe place.

_____ 47. I tried to control my thoughts.

_____ 48. I went to see somebody.

_____ 49. I went to sleep.

_____ 50. I stopped everything I was doing.

_____ 51. I tired to ignore my feelings of anxiety.

_____ 52. I left to find fresh air.

Please briefly indicate what situation you were thinking of when answering this questionnaire:

_____