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

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Abstract

Background and Objectives: The extant literature has shown mixed results regarding the impact of distraction use on exposure outcome; however, a wide variety of distraction tasks have been utilized across studies. In order to better understand these discrepant findings, we aimed to evaluate the impact of differing levels of distraction on exposure outcome. Additionally, treatment acceptability and changes in self-efficacy were assessed to evaluate how these may differ as a function of distraction use. *Methods:* In Experiment 1 (N = 176 participants tested), distraction tasks were experimentally validated through assessing changes in reaction time when completing concurrent tasks. Based on Experiment 1, distraction tasks were selected for use in Experiment 2, in which contamination-fearful participants were randomly assigned to one of four conditions: no, low, moderate, or high distraction during an exposure session. Participants (N = 124) completed a behavioural approach test and self-efficacy measure pre- and post-exposure and at one-week follow-up. Treatment acceptability was assessed immediately following the exposure session. *Results:* There were no significant differences between conditions for changes in behavioural approach pre- to post-exposure or at one-week follow-up. However, increases in self-efficacy pre- to post-exposure were greatest for moderate distraction, and treatment acceptability was highest with moderate and high distraction. *Limitations:* Participants were not assessed for clinical severity, were not treatment-seeking, and only one specific type of fear was investigated. *Conclusions:* Distraction (at any level) did not appear to negatively impact exposure outcome (all conditions improved pre- to post-exposure and at follow-up), but utilizing moderate to high amounts of distraction increased treatment acceptability.

Keywords: Exposure; Distraction; Anxiety; Treatment Acceptability; Self-efficacy; Contamination Fear.

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

When faced with anxiety-provoking situations, individuals often attempt to reduce their distress through the use of distraction strategies that distance oneself from a feared situation through reduced visual or cognitive attention. Although it has been suggested that distraction during exposure therapy for anxiety interferes with emotional processing (e.g., Foa & Kozak, 1986; Rachman, 1980) and with extinction (e.g., Craske et al., 2014) by reducing attentional focus (e.g., Barlow, 1988), others have asserted that fear reduction can occur through other means (see Rachman, 2015). For example, Bandura (1977, 1988) proposed that fear reduction can occur following mastery over a situation, resulting in increased self-confidence, self-efficacy, and perceived ability to conquer tasks and tolerate distress. Individuals often use emotional arousal as a measure of coping ability, and the use of distraction may aid in reducing arousal, thereby increasing feelings of accomplishment. It has thus been argued that increased self-efficacy may relate to fear reduction (e.g., Bandura, 1977, 1988), and importantly that distraction does not necessarily impede (and may in fact aid in) this process. Furthermore, cognitive accounts of fear reduction during exposure postulate that belief disconfirmation (e.g., non-occurrence of feared outcomes, new understanding of core concept) plays a central role in exposure outcome. Salkovskis (1991) suggested that the use of strategies that aim solely to decrease anxiety in a situation will not interfere with belief disconfirmation, as helping manage anxiety symptoms does not inherently block the ability to obtain disconfirmatory evidence. Although these (and other) theories do not predict a negative impact associated with distraction use, it remains important to understand when, how, and for whom the use of distraction may be appropriate. Furthermore, given a recent focus on treatment acceptability (e.g., Milosevic, Levy, Alcolado, & Radomsky, 2015) with the hypothesis that enhanced acceptability may result in reduced treatment refusal and drop-out (e.g., Rachman, Radomsky, & Shafran, 2008), it may be useful to investigate whether distraction may increase acceptability.

Although many studies have investigated the impact of distraction during exposure, results are inconsistent. While some studies show no difference in treatment outcome when distraction is used versus when it is not (e.g., Antony et al., 2001; Rose & McGlynn, 1997), others show that distraction impedes fear reduction within (e.g., Kamphuis & Telch, 2000; Rodriguez & Craske, 1995) and between sessions (e.g., Craske, Street, & Barlow, 1989; Kamphuis & Telch, 2000), while others show that distraction can aid in fear reduction within (e.g., Craske, Street, Jayaraman, & Barlow, 1991; Grayson, Foa, & Steketee, 1986; Penfold & Page, 1999) and between sessions (e.g., Johnstone & Page, 2004; Oliver & Page, 2003, 2008). Given these discrepant results, it is important to investigate specific factors that may influence outcome. Although several aspects may be relevant, one potentially important factor relates to the level of difficulty (i.e., cognitive load) of the distraction tasks (e.g., Kamphuis & Telch, 2000; Podină, Koster, Philippot, Dethier, & David, 2013; Rodriguez & Craske, 1993, 1995; Telch et al., 2004).

Studies investigating distraction use during exposure have employed a wide variety of tasks with differing levels of complexity. For example, these have included reading words aloud (e.g., Haw & Dickerson, 1998), viewing images (e.g., Rodriguez & Craske, 1995), playing video games (e.g., Grayson, Foa, & Steketee, 1982, 1986), conversational tasks (e.g., Oliver & Page, 2003), and completing mathematical tasks (e.g., Kamphuis & Telch, 2000). Careful consideration of task-related differences may be central to understanding the role of distraction during exposure, given that varied levels and forms of distraction may lead to diverse outcomes.

Specifically, the amount of cognitive resources necessary to engage in distraction (i.e., cognitive load or working memory taxation) will inherently differ based on task complexity. Working memory refers to the memorial system responsible for holding, manipulating, and processing information (see Baddeley, 1992); when working memory is taxed, resources are being utilized at close to their capacity. When a task involves greater cognitive load, fewer cognitive resources are available to process other aspects of one's environment and experience. It is possible that if distraction tasks involve differing levels of working memory taxation or cognitive load, variable levels of resources would remain available to process the exposure.

The effect of cognitive load on exposure outcome has been established as a likely mechanism underlying the effects of eye movement desensitization and reprocessing (EMDR), a treatment for posttraumatic stress disorder (PTSD; e.g., Bisson et al., 2007). EMDR involves the visualization of past traumatic experiences (i.e., imaginal exposure) while focusing on the therapist's finger moving back and forth (Shapiro, 1995). While some have reported that exposure is the active ingredient in EMDR (for a review see Cahill, Carrigan, & Frueh, 1999), a more parsimonious conceptualization of EMDR includes the theorized treatment enhancing role of eye movements. Specifically, Shapiro (1989) argued that exposure alone was insufficient, and that eye movements appeared to be a helpful component in fear reduction. In a study by Lee, Taylor, and Drummond (2006), qualitative coding of the content of imaginal exposure alone or with eye movements indicated that when individuals processed trauma in a detached fashion they showed greater improvement; detachment was identified as a specific consequence of EMDR. Importantly, more recent studies have established that the efficacy of EMDR may relate to the eye movements taxing working memory or increasing cognitive load (Engelhard, van den Hout, Janssen, & van der Beek, 2010; Engelhard et al., 2011; van den Hout & Engelhard, 2012; van den Hout et al., 2010).

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

If working memory is taxed during an anxiety-provoking experience (e.g., an exposure session), the emotionality of the experience may be less intense and less vivid, thus leading to encoding the event as less distressing. Theoretically, this suggests that differing levels of cognitive load during exposure may lead to altered levels of processing of treatment components. In order to investigate this theory, the two experiments presented below were designed to determine the impact of varying cognitive load in distraction tasks on exposure outcome. The first experiment aimed to assess the level of cognitive load of a number of tasks in order to select appropriate distraction tasks for the second study, which investigated the effect of differing levels of distraction on exposure outcome in a contamination-fearful sample; this sample was selected to address a further goal of exploring the role of distraction in problems other than specific phobia. It was hypothesized that moderate levels of distraction during exposure would enhance fear reduction compared to a no distraction control, and that high levels of distraction would interfere with fear reduction.

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

Experiment 1

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

Method

Participants. Participants were (N = 180) undergraduate students who completed the study in exchange for course credit. Following the exclusion of four participants (see below), data from 176 participants were retained. Participants ranged in age from 18 to 51 years, with a mean age of 23.08 (SD = 5.58) years. The majority of participants was female (82%) and Caucasian (66%). There were no significant differences between conditions in terms of age, $F(4, 175) = 1.33$, $p = .26$, partial $\eta^2 = .04$, or sex, $\chi^2(4) = 2.60$, $p = .63$.

Measures

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

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

Materials. The computerized reaction time task was displayed on a 30 cm by 48 cm monitor. Stimuli were white shapes (2.5 cm in diameter) presented in the center of a black screen. Participants used a standard keyboard to respond to stimuli.

Procedure. Participants first completed a brief training phase to ensure they understood the reaction time task. They then completed a baseline reaction time task (baseline phase) followed by concurrently completing the reaction time task and one of five randomly assigned verbal distraction tasks (test phase). The five tasks are described below in ascending order of predicted complexity (i.e., cognitive load). Task 1 involved repeating words (e.g., full, night, room) read aloud by the experimenter. Task 2 involved naming the colour of items (e.g., lemon, flamingo, cotton) read aloud by the experimenter. Task 3 involved a conversation about goals, school, and the future, guided by a standard list of questions. Task 4 involved providing detailed procedural descriptions of how to complete tasks (e.g., making dinner, getting ready for bed). Task 5 involved the same conversation task as Task 3, but participants were also instructed to say ”three” after every third word they said. This portion of the study was audio-recorded for reliability purposes. After completing the test phase, participants responded to questions about perceived cognitive load.

Data analyses. Percent change in reaction time from baseline to test phase was used as an index of cognitive load for each task (i.e., more slowed reaction times indicated more taxing tasks). Percent change in reaction time ((mean of test phase – mean of baseline phase)/mean of baseline phase) was utilized as it accounts for initial reaction time performance.

Results

Data screening and cleaning. First, all reaction times associated with incorrect responses were removed (coded as missing). Mean reaction times were then calculated for each participant for baseline and test phases, as well as percent change in reaction time. Outliers were identified using criteria suggested by Tabachnick and Fidell (2007). There were four outliers on baseline performance that were removed from subsequent analyses: two with low accuracy, and two with slow reaction times.

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

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

Overall analyses. Prior to conducting percent change analyses, a 2 (time) by 5 (condition) mixed ANOVA was conducted in order to investigate condition differences in reaction times at baseline and test periods. There was a main effect of condition, $F(4, 175) = 12.77$, $p < .001$, partial $\eta^2 = .23$, a main effect of time, $F(1, 175) = 195.80$, $p < .001$, partial $\eta^2 = .53$, and a significant time by condition interaction, $F(4, 175) = 16.00$, $p < .001$, partial $\eta^2 = .27$.

The observed interaction (see Figure 1) indicated that as predicted task complexity increased, the difference between baseline and test phase reaction times increased.

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

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

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

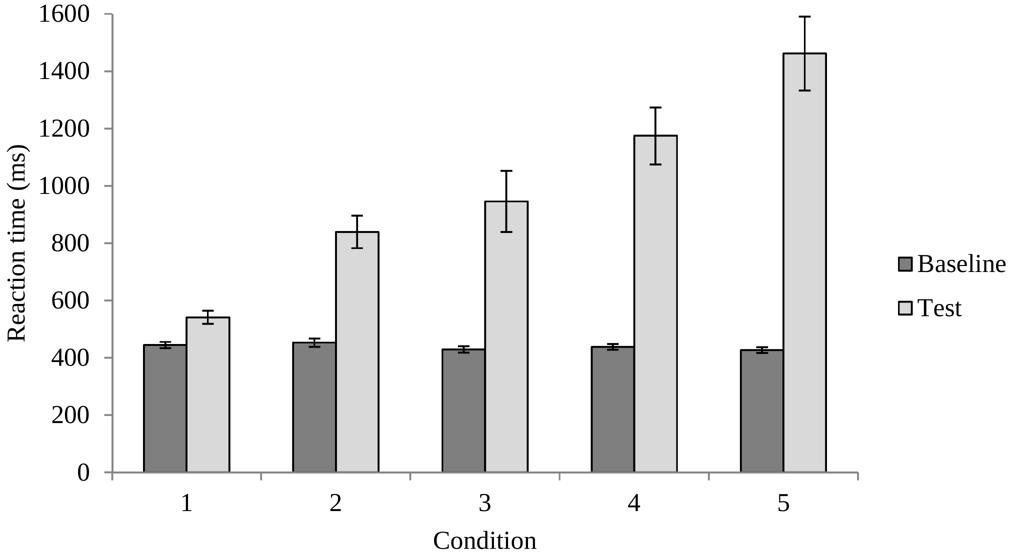

Figure 1. Mean reaction times during baseline and test phases, by condition in Experiment 1. Error bars are standard errors. Note: For paired *t*-tests within each condition, all *p*'s <.001.

Table 1

Reaction time by condition and time, and percent change in reaction time by condition in Experiment 1

	Condition				
	1 (n = 35)	2 (n = 35)	3 (n = 35)	4 (n = 36)	5 (n = 35)
Baseline *M* (*SD*)	444.89[a] (64.16)	453.47[a] (86.56)	429.44[a] (63.99)	438.67[a] (59.24)	427.20[a] (59.08)
Test *M* (*SD*)	541.66[a] (132.84)	838.92[ab] (332.85)	945.71[bc] (627.93)	1174.71[bc] (597.11)	1461.22[d] (760.74)
Percent change *M* (*SD*)	21.56[a] (27.74)	84.21[ab] (58.53)	111.85[bc] (109.39)	163.89[c] (120.51)	239.97[d] (169.02)

Note. Reaction times are reported in milliseconds; 1 = Condition 1 (word repetition); 2 = Condition 2 (colour naming); 3 = Condition 3 (conversation); 4 = Condition 4 (procedural descriptions); 5 = Condition 5 (conversation with threes); Baseline = baseline phase; Test = test phase; Percent change = percent change in reaction time from baseline to test phase; within each row, values that share the same superscripted letter did not significantly differ from each other (p > .05).

Discussion

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

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

This study was characterized by a number of limitations. First, although reaction time was measured during both baseline and test phases (with the baseline phase serving as a control), a no distraction control condition was not included. It is possible that fatigue effects and/or practice effects may have impacted reaction times during the test phase. However, the question addressed in this study related to differences between distraction tasks rather than specific differences from baseline. Second, the reaction time task was quite simple. Although this may have allowed for more clear differences between conditions, it may not generalize to more complex tasks, such as exposure. It is unclear whether the same magnitude of results would have been observed with a more complex reaction time task. Another potential limitation is that participants were not given specific instructions regarding which task they were to complete with the greatest accuracy; therefore, individuals may have approached the tasks with different goals. Additionally, during the reaction time task, the symbol remained on the screen until a response was indicated (i.e., there was no response time limit), which limited the ability to interpret accuracy-related results due to overall high accuracy performance. Finally, while the tasks have been categorized as having low, moderate, and high levels of cognitive load, it is possible that more and less cognitively demanding tasks exist, and thus the selected tasks may not necessarily represent the full range of possible levels of cognitive load.

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

Experiment 2

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

Additionally, this study investigated the impact of distraction use on perceived acceptability of treatment and changes in self-efficacy over the course of an exposure session. Given that recent research has suggested that the use of safety behaviour may enhance the acceptability of treatment (e.g., Levy & Radomsky, 2014; Milosevic & Radomsky, 2013a), and that distraction is often considered a covert form of safety behaviour, it was predicted that individuals using at least a moderate level of distraction would rate the acceptability of the exposure session higher than individuals who did not use distraction. Furthermore, it was predicted that increases in self-efficacy would be greatest for the moderate distraction condition. Greater increases in self-efficacy have been observed in previous studies in conditions using distraction compared to focused exposure (e.g., Johnstone & Page, 2004). This relates to Bandura's (1977, 1988) self-efficacy theory proposing that distraction can aid in reducing physiological arousal which leads to more positive perceptions of coping ability. However, the same degree of change in self-efficacy was not expected when individuals were highly distracted due to the fact that these individuals may be less engaged by the exposure stimulus and therefore less likely to integrate this experience with their overall perception of coping ability.

Method

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

A total of 124 individuals were eligible for and participated in the study, 103 (83%) of whom were recruited as part of the undergraduate sample. Participants had a mean age of 24.85 (*SD* = 8.29) years. The majority was female (*n* = 114, 92%) and identified as Caucasian (*n* = 64, 52%). Mean scores on measures of contamination fear were representative of a fearful sample, and are reported in Table 2. Participants were randomly assigned to one of four conditions (see *Procedure*), and there were no condition differences in terms of age, sex, or symptoms of depression, or contamination fear (see Table 2). One participant (in the control condition) dropped out of the study during the exposure session due to their anxiety. Additionally, three individuals (one from the control condition and two from the moderate distraction condition) did not return for the second visit due to scheduling difficulties or illness, and therefore were excluded from analyses assessing change from post-exposure to follow-up.

Measures

Vancouver Obsessional Compulsive Inventory (VOCI; Thordarson et al., 2004). The VOCI is a 55-item questionnaire that assesses a broad range of obsessive compulsive symptoms, including a subscale consisting of contamination-related symptoms. The contamination subscale was used to assess severity of contamination fear. Participants used a 5-point Likert scale with

Table 2

Participant characteristics by condition in Experiment 2

		Condition					
	Total (*N* = 124)	Control (*n* = 31)	Low (*n* = 30)	Moderate (*n* = 33)	High (*n* = 30)	$F/\chi 2$	*p*
Age *M* (*SD*)	24.85 (8.29)	24.35 (7.62)	26.07 (8.15)	23.64 (6.93)	25.47 (10.38)	0.54	.657
Female *n* (%)	114 (91.9)	28 (90.3)	26 (86.7)	32 (97.0)	28 (93.3)	2.44	.486
BDI-II *M* (*SD*)	12.02 (10.06)	12.74 (11.38)	12.30 (10.42)	12.48 (10.49)	10.50 (7.87)	0.31	.820
VOCI-CTN *M* (*SD*)	22.31 (11.49)	21.74 (11.09)	22.23 (11.30)	21.85 (11.92)	23.50 (12.07)	0.15	.931

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

scores ranging from 0 to 4 to indicate how much each statement is true of them. Internal consistency for the contamination subscale in the current sample was α = .91.

Treatment Acceptability/Adherence Scale (TAAS; Milosevic, Levy, Alcolado, & Radomsky, 2015). The TAAS is a 10-item questionnaire that assesses perceived acceptability of treatment (e.g., "It would be distressing to me to participate in this treatment", "If I began this treatment, I would be able to complete it"). Statements are rated on a 7-point Likert scale from 1 (*disagree strongly*) to 7 (*agree strongly*). This scale was used to assess the perceived acceptability of the exposure component of the study. The internal consistency in the current study was α = .88.

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

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

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

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

Questions assessing cognitive load and attention.

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

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

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

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

Materials. The “dirty toilet” used in this study as the fear stimulus was a plain white toilet that was made to appear dirty by spreading potting soil and melted chocolate inside the toilet bowl. The toilet was situated in the corner of the room used for the BATs and exposure session, and was used as the stimulus for both of these tasks. Many other studies investigating distraction during exposure have utilized the same stimulus for the exposure session and BATs (e.g., Mohlman & Zinbarg, 2000; Rodriguez & Craske, 1995; Telch et al., 2004). To measure behavioural approach, a hierarchy of steps was used that included first approaching and later touching different parts of the toilet (see Appendix A).

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

Experimental conditions. Participants were randomly assigned to one of four conditions: no, low, moderate, or high distraction. The tasks used in the distraction conditions were determined in Experiment 1. Specifically, the low distraction task included repeating words back to the experimenter, the moderate distraction task included a guided conversation, and the high distraction task was the same as the moderate task except participants were also asked to say “three” after every third word.

Exposure session. Instructions regarding the purpose of the exposure session and the exposure format (see below) were standardized across conditions, including the request to maintain visual focus on the stimulus throughout the exposure. No specific information about distraction or attention was provided in the rationale. Randomization to condition followed, at which point condition-specific instructions, including those about the distraction task (if relevant), were provided.

The exposure session was 20 minutes and self-paced (i.e., the participant decided if and when to proceed). The exposure session typically began at the last step the participant had completed during the pre-exposure BAT, although all participants were given the option of starting at a lower step if they desired. The exposure session was designed to be sufficiently long to allow for learning to occur, including the potential violation of expectations (e.g., Craske et al., 2014), depending on fear content. Many other studies of distraction use in exposure have utilized exposure sessions of similar length, with some 15 minutes or less in duration (e.g., Garcia-Palacios et al., 2007; Haw & Dickerson, 1998; Johnstone & Page, 2004; Rodriguez & Craske, 1995). Participants were asked to indicate their anxiety level every two minutes, and BAT distance was also recorded at these intervals. Possible exposure steps paralleled the BAT steps, and participants were instructed to inform the experimenter if they wished to continue in order to be provided with the next step. Additionally, if a participant reported a SUDS level of less than 40 they were provided with the next step, but were informed that they could choose whether or not they wished to move forward.

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

Results

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

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

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

One-way ANOVAs were conducted to investigate differences between conditions on variables assessing cognitive load and attention. In terms of visual attention, there were no differences between conditions, $F(3, 123) = 1.57$, $p = .201$, partial $\eta^2 = .04$. For cognitive load, differences were only investigated between conditions using distraction tasks, as the items were not relevant to the no distraction condition. There were significant differences between conditions, $F(2, 90) = 29.30$, $p < .001$, partial $\eta^2 = .39$, with follow-up analyses with a Bonferroni correction showing significantly greater cognitive load in the high condition compared to the low and moderate conditions (*p*'s < .001), and a trend towards greater cognitive load in the moderate condition compared to the low condition ($p = .056$). Finally, the use of other distraction techniques was significantly different between conditions, $F(3, 123) = 7.88$, $p < .001$, partial $\eta^2 = .17$. Specifically, the control condition had significantly higher scores than both the moderate and high conditions, and the low condition had significantly higher scores than the high condition.

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

Self-report symptom measures. A mixed 2 (time) by 4 (condition) ANOVA was conducted in order to assess changes in self-reported contamination fear using the VOCI-CTN between pre-exposure (i.e., baseline) and one-week follow-up. There was trend toward a main effect of time, $F(1, 120) = 3.77$, $p = .055$, partial $\eta^2 = .03$, with scores reducing over the course of the study regardless of condition, but there was no significant time by condition interaction, $F(3, 120) = 1.06$, $p = .369$, partial $\eta^2 = .03$.

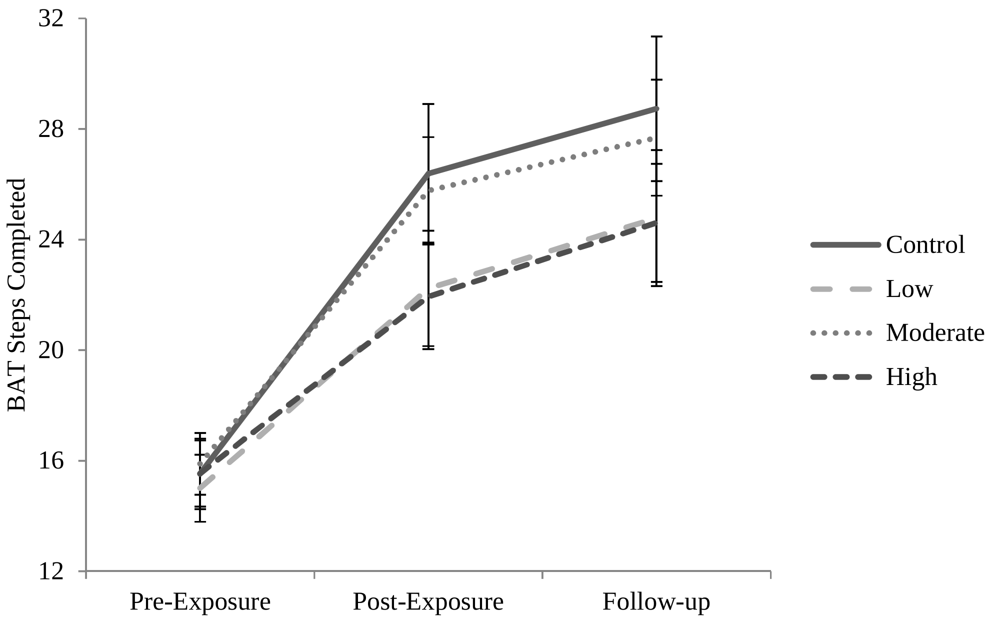

Figure 2. Behavioural approach by condition and time in Experiment 2; BAT = Behavioural Approach Test. Error bars are standard errors.

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

Treatment acceptability. To investigate differences in treatment acceptability, a one-way between-participants ANOVA was conducted using TAAS scores as the outcome variable. There was a significant difference between conditions, $F(3, 123) = 7.23$, $p < .001$, partial $\eta^2 = .15$ (see Figure 4). *Post hoc* comparisons using a Bonferroni correction showed that the moderate condition rated treatment acceptability significantly higher than the control ($p = .013$, $d = 0.79$) and low ($p < .001$, $d = 1.01$) conditions. Additionally, the high distraction condition showed significantly higher acceptability ratings than the low distraction condition ($p = .013$, $d = 0.80$). The difference between the control and high distraction conditions was not significant ($p = .212$, $d = 0.56$).

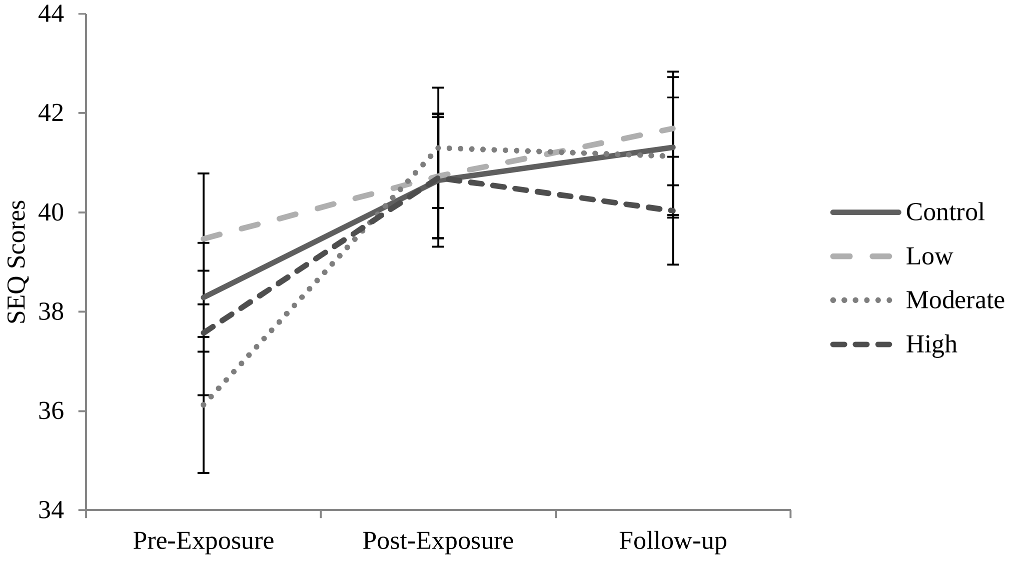

Figure 3. Self-efficacy scores by condition and time in Experiment 2; SEQ = Self-Efficacy Questionnaire for Phobic Situations. Error bars are standard errors.

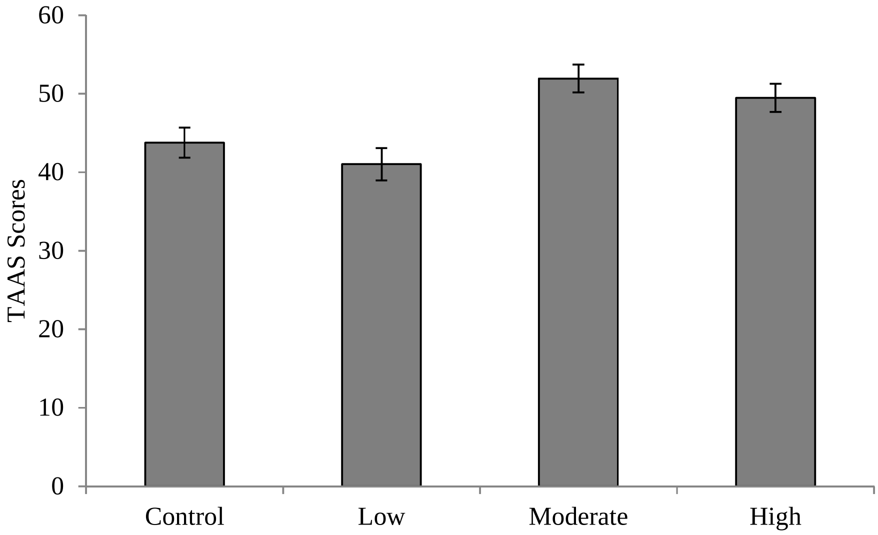

Figure 4. Treatment acceptability scores by condition in Experiment 2; TAAS = Treatment Acceptability and Adherence Scale. Error bars are standard errors.

Discussion

This study investigated the impact of differing levels of distraction on exposure outcome, treatment acceptability, and changes in self-efficacy, in a contamination-fearful sample. The three distraction conditions (low, moderate, and high distraction) were previously established as having differing levels of cognitive load (see Experiment 1). Contrary to our hypothesis, there were no significant differences between conditions (no, low, moderate, or high distraction) in change in behavioural approach following an exposure session or at one-week follow-up; however, effect sizes indicated less improvement following exposure in the high distraction condition. Consistent with hypotheses, increases in self-efficacy following exposure were greatest in the moderate distraction condition, and treatment acceptability ratings were greatest in conditions utilizing moderate or high levels of distraction. Overall, no statistically significant differences were observed in terms of exposure outcome (or changes in contamination fear symptomatology) based on condition, supporting the notion that distraction may not interfere with exposure. Additionally, these results provide preliminary evidence that distraction use during exposure may increase treatment acceptability and aid in increasing self-efficacy.

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

Further, although participants were screened for high levels of fear, they were not assessed for clinical severity, nor were they treatment-seeking; however, scores on self-report measures of contamination were comparable to those of clinical samples (see Thordarson et al., 2004). Therefore, generalizability to a clinical treatment-seeking sample is unclear. Additionally, only one specific type of anxiety was investigated, namely contamination fear. It is possible that habituation of fear occurs at different rates for various types of anxiety, and that differences may have emerged with another type of fear, such as a specific phobia. However, we chose to examine contamination fear because many of the studies in this area have been conducted with specific phobias, and we strived to expand this work to other (perhaps more complex) fears. Additionally, specific instructions regarding distraction use (or lack thereof) were not provided to the control condition in order to allow this condition to represent exposure as usual; unfortunately individuals in this condition therefore often utilized distraction techniques without being specifically instructed to do so. Given that individuals in the control condition often utilized their own distraction techniques (M = 4.97, SD = 2.81; 0 to 9 scale assessing frequency of use), comparisons with the instructed distraction conditions are essentially less strong. However, the vast majority of studies on distraction using an exposure do not provide instructions regarding attentional focus in exposure-only conditions (e.g., Kamphuis & Telch, 2000; Oliver & Page, 2008; Rodriguez & Craske, 1995; Telch et al., 2004). It is also worth noting that the internal consistencies of self-reported cognitive load and visual attention in Experiment 2 were low (α = .61 and .65, respectively). Finally, the same stimulus was utilized for the BAT assessments and the exposure session, consistent with some other distraction studies (e.g., Mohlman & Zinbarg, 2000; Rodriguez & Craske, 1995; Telch et al., 2004) but nonetheless limits our ability to observe general changes in contamination fear. Notwithstanding the above limitations, the results remain promising and informative.

Given our findings, the level of distraction used in treatment may simply not be important to exposure outcome. Discrepant findings in the extant distraction literature shaped our hypothesis due to the wide range of distraction tasks employed. However, it is possible that other factors may be more important to whether or not distraction is helpful or harmful during exposure. Specifically, it is possible that distraction task properties (e.g., interest in the task, personal relevance, etc.) or individual differences (e.g., personality, coping style, etc.) may help explain previous mixed findings. Similarly, beliefs about distraction (e.g., whether distraction is viewed as effective or necessary) may play an important role in the degree to which distraction aids or detracts from exposure efficacy (Senn & Radomsky, 2015). Additionally, it may be important to consider cognitive versus visual distraction. In the current study, cognitive attention was manipulated while visual attention was maintained across conditions (supported by self-reported ratings of cognitive and visual attention). In many other distraction studies reporting favourable outcomes related to distraction use, visual attention was maintained (e.g., Craske, Street, Jayaraman, & Barlow, 1991; Johnstone & Page, 2004; Oliver & Page, 2003, 2008). Furthermore, in many studies with negative effects of distraction, visual attention was not maintained in the distraction condition (e.g., Grayson, Foa, & Steketee, 1982; Schmid-Leuz, Elsesser, Lohrmann, Jöhren, & Sartory, 2007), or participants were specifically requested to visually focus on the distractor (e.g., Rodriguez & Craske, 1995). It is therefore possible that the level of cognitive load of a distraction task is less important than visual attention to the feared stimulus, or that these two factors may interact. One study conducted by Mohlman and Zinbarg (2000) attempted to assess the importance of both visual and cognitive attention through manipulating both factors. They found that presence of both types of attention was related to lower fear ratings during a post-exposure BAT; however, further research may be necessary to further elucidate the impact of these factors. Overall, it is important to continue clarifying the role of various forms of distraction (or individual differences) to aid in our understanding of the existing distraction literature, and to obtain clinically-relevant information regarding how (and for whom) distraction should or should not be utilized during treatment.

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

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

It is worth noting that one participant in the control condition dropped out of the study during the exposure because he was too anxious to continue. When this participant was debriefed about the purpose of the study, they said “I could have done it if I had been distracted”. Others in the control condition often stated they wished they had been in a distraction condition, or similarly, that they would have completed more steps if they had been distracted. Individuals in the moderate and high distraction conditions often provided unsolicited comments stating how helpful the distraction was, including comments such as “the conversation made me feel relaxed and made me feel like I could do it – now I can continue to confront my fears because I know it isn’t a big deal”. Notably, there is some anecdotal support that high levels of distraction may have led to individuals feeling distanced from the exposure (e.g., “that really worked, I totally forgot my hand was even on the toilet”). These comments as a whole support the notion that participants found the treatment more acceptable when distracted, and that many individuals in the control condition were disappointed that they were not provided with a distraction task.

While distraction may aid in increasing treatment acceptability, it remains important to discern whether there are certain circumstances under which distraction should or should not be used. These circumstances may theoretically relate to either the type of distraction used or to individual differences between clients. In other words, it is possible that for certain individuals the use of distraction during the initial stages of treatment to help increase acceptability and self-efficacy may be useful and even encouraged, whereas for other individuals this may be discouraged (e.g., those who believe distraction is *necessary*; Senn & Radomsky, 2015). Additionally, certain types of distraction may be more useful than others. The current study utilized verbal tasks because we thought the task used in the condition we hypothesized would perform best (i.e., moderate distraction) could easily be implemented in clinical practice, and also because it paralleled tasks used in previous studies with positive outcomes for distraction use (e.g., Oliver & Page, 2003); however, other types of distraction may lead to different results. Additionally, it may be useful to understand whether the role of distraction differs when it is used during encoding, extinction, or during post-event processing. In summary, more research will aid in further elucidating when, how, and for whom distraction may be useful. However, given that the use of distraction during exposure may not necessarily be harmful and that its use may increase perceived acceptability of treatment, its potential utility within the context of exposure may have important clinical implications.

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Appendix A

Hierarchy of BAT steps in Experiment 2

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

Lift the toilet seat up

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

Highlights

- The impact of distraction on exposure is unclear due to varied protocols
- The level of cognitive load associated with distraction tasks may be important
- Levels of distraction were experimentally validated (low, moderate, and high)
- Including a no distraction control, distraction level did not impact exposure outcome
- Treatment acceptability and self-efficacy were highest when distraction was used

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

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We have no conflicts of interest to declare.

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