Optimal Attentional Focus during Exposure in Specific Phobia: A Meta-analysis

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Abstract

Over the last 30 years, researchers have disagreed over the consequences of diverting attention from threat for exposure efficacy, which is an important theoretical and clinical debate. Therefore, the present meta-analysis assessed the efficacy of attentionally focused exposure against distracted and attentionally uninstructed exposure regarding distress, behavioral, and physiological outcomes. We included 15 randomized studies with specific phobia, totaling 444 participants and targeting outcomes at post-exposure and follow-up. Results indicated no difference between the efficacy of distracted exposure as opposed to focused or uninstructed exposure for distress and physiology. For behavior, at post-exposure, results were marginally significant in favor of distracted as opposed to focused exposure, while at follow-up results significantly favored distraction. However, concerning behavior, uninstructed exposure was superior to distraction. Moderation analyses revealed that, regarding distress reduction and approach behavior, distracted exposure significantly outperformed focused exposure when the distracter was interactive (g = 1.010/g = 1.128) and exposure was spread over the course of multiple sessions (g =1.527/g =1.606). No moderation analysis was significant for physiological measures. These findings suggest that distraction during exposure could be less counterproductive than previously considered and even beneficial under certain circumstances. Theoretical implications and future directions for research are discussed.

Keywords: distraction, focus, exposure, optimal attention, meta-analysis

Optimal Attentional Focus during Exposure in Anxiety Disorders: A Meta-analysis

Exposure therapy is a widely used and effective treatment for anxiety disorders (McNally, 2007). In many treatment packages for anxiety, exposure is considered a crucial component, which involves confronting the feared stimulus or situation (e.g., a thought, a sensation, an animal) until fear related to that stimulus subsides. Though exposure is used on a large scale in cognitive and behavioral therapies for anxiety disorders (Norton & Price, 2007), there is much debate around the factors that facilitate or impede symptom reduction in exposure (McNally, 2007). One factor that has been subjected to a wealth of research is *optimal attentional focus* during exposure therapy, which according to some views plays a major role in exposure efficacy (Craske et al., 2008). However, as results of studies have been inconsistent, this research has diminished with negative implications for theory and practice in terms of providing answers to questions regarding optimal attentional focus during exposure. Up to date, only narrative reviews of the literature have been published (Rodriguez & Craske, 1993; Ellis, 2012). More systematic attempts to examine the available data are lacking. In an attempt to investigate attentional focus as a mechanism of change for evidence based exposure interventions (David & Montgomery, 2011), we sought to examine the influence of attentional focus on the efficacy of exposure therapy through systematic review of the literature and meta-analysis. Given that most available data on this precise question addressed specific phobia, in order to draw clear cut conclusions, we specifically targeted this disorder.

Theoretical Background

Current leading models of exposure (e.g., emotional processing theory, Foa & Kozak, 1986; inhibitory learning, Bouton, 1993; Craske et al., 2008), suggest that attentional processing

of threat information is important for fear reduction to take place. Therefore, we will briefly discuss the role of attentional focus in exposure theories below.

On the one hand, Foa and Kozak (1986) proposed a neo-behavioral account, which improved upon earlier habituation and extinction explanations of fear reduction by detailing how exposure changes fear representation in memory. Central to this account is emotional processing during exposure treatment, evidenced by the following: (1) activation of the fear network reflected in physiological arousal and self-reports of fear; and (2) within/between-session habituation, reflected in lower fear during sessions and across sessions. Via exposure therapy, emotional processing (i.e., changes in the fear structure) occurs when non-threat information is incorporated in the fear network, meaning that: (a) the non-threat significance is attached to feared stimuli (i.e., conditioned stimuli, CS) and fear responses (i.e., conditioned response, CR); (b) pathological associations between CS and CR are loosened, leading to symptom reduction (Foa, Huppert, & Cahill, 2006). Sensory encoding of threat during exposure, by means of attentional focus for example, is viewed by Foa and Kozak (1986) as a prerequisite for emotional processing, thus for symptom reduction.

On the other hand, in contrast to emotional processing theory, the inhibitory learning account (Bouton, 1993; Craske et al., 2008) suggests that the mechanism of exposure lies not in eliminating the CS-US negative association (US: e.g., a dog bite), but in acquiring and reinforcing a new safe representation of the CS (e.g., the dog doesn't bite). Namely, during exposure, fear subsides as a result of a mismatch between the patient's expectation (e.g., to be bitten by the dog) and the outcome (e.g., actually not being bitten by the dog) (Arch & Craske, 2012). Through such mismatches new representations about the CS are formed. Attentionally focusing on the CS (e.g., a dog) during exposure is important in allowing non-threatening

information about the CS to be noticed and processed (e.g., "the dog doesn't bite me") and subsequently develop new non-threatening CS-noUS associations (e.g., dog - no dog bite) (Bouton, 1993; Craske et al., 2008).

Operational Definition of Attention Allocation During Exposure

In examining the role of attentional focus in exposure efficacy typically a between subjects design is used, comparing the efficacy of focused (i.e., allocated attention to threat during exposure) vs. distracted exposure (i.e., diverted attention from threat during exposure). It is important to specify how focused and distracted exposure therapies have been operationalized in previous research. Therefore, we will briefly discuss these concepts here.

Focused exposure is defined as deliberately paying attention to either the external features of the feared stimulus (e.g., a spider) and/or to the internal sensations of fear and anxiety (e.g., pounding heart in panic disorder) during exposure (Oliver & Page, 2008), depending on the type of anxiety disorder (Mulkens, Bögels, de Jong, & Louwers, 2001). For instance, in social anxiety and specific phobia, oftentimes external attention to the phobic stimulus is recommended (Bögels, Mulkens & de Jong, 1997; Mulkens et al., 2001), while in panic disorder internal attention to sensations is considered a standard component of exposure (Craske, Street, & Barlow, 1989). Irrespective of threat stimulus orientation (i.e., inward or outward), attentional resources during exposure should be fully engaged visually and/or cognitively with the feared stimulus (Mohlman & Zinbarg, 2000). Therefore, many manipulations of attentional focus entail looking at the feared stimulus (e.g., Oliver & Page, 2003; 2008), whereas other manipulations involve allocating both visual and cognitive resources to process the attended stimulus (e.g., Mohlman & Zinbarg, 2000). All in all, these task-related differences might be reflected in the

mixed results that focused exposure literature is confronted with (for review, see Parrish, Radomsky, & Dugas, 2008).

Distraction in this context can be broadly defined as the "lack of attention to the perceived source of threat" (Sy, Dixon, Lickel, Nelson, & Deacon, 2011, p. 306). Distracted exposure is frequently regarded as a form of safety behavior that would prevent the encoding of non-threat information (Foa & Kozak, 1986). In empirical research, distracted exposure can be clustered into visual/cognitive distraction (Mohlman & Zinbarg, 2000), high /low cognitive load (Raes, De Raedt, Verschuere, & De Houwer, 2009), and inward/outward distraction (Oliver & Page, 2008). Visual distraction involves looking at a location other than the location of the feared stimulus, while cognitive distraction involves a threat irrelevant task (e.g., memorizing digits) that interferes with cognitive resources allocated to the threat stimulus (e.g., Mohlman & Zinbarg, 2000). The extent to which a secondary task during exposure interferes with symptom reduction depends on the cognitive load imposed by the distracter (e.g., Telch et al., 2004; Rodriguez & Craske, 1995), which can be more or less resource demanding. In addition, the distracting task can encompass internal orientation to the person's fear irrelevant reactions or external orientation to the non-threatening aspects of the stimuli (e.g., Oliver & Page, 2008). Moreover, these variations across distraction tasks may contribute to the mixed results noticed in studies investigating distracted exposure (Parrish et al., 2008).

Methodological Considerations

Within the broad framework just outlined, studies have used a wide range of methodologies to manipulate attentional focus during exposure. Several important methodological issues in the relevant studies need to be discussed.

First, there are debates over whether patients need to focus visually and/or cognitively on threatening stimuli. Some studies employ visual focus on the threat stimulus (e.g., Rodriguez & Craske, 1995), while others use combined visual and cognitive attention to threat during exposure (e.g., Mohlman & Zinbarg, 2000). Also, in order to be able to verify the focus of attention, some tasks require participants to verbalize features of feared stimuli, not only to be visually exposed to them (Johnstone & Page, 2004; Penfold & Page, 1999, Schmid-Leuz, Elsesser, Lohrmann, Johren, & Sartory, 2007; Oliver & Page, 2003, 2008). This is important, since verbalizing experiences may also have anxiety-reducing effects by themselves (Tabibnia, Lieberman, & Craske, 2008).

Second, one of the shortcomings of most studies that use attentional instructions during exposure is the lack of an objective manipulation check to assess whether participants followed the attentional instructions (Penfold & Page, 1999; Oliver & Page, 2003, 2008). Few studies employed other measures than post exposure self-report to check for attentional focus, which according to Mohlman and Zinbarg (2000) renders some results questionable. Therefore, in most studies, we do not know to what extent participants' diverted attention from or allocated attention to the threat (Schmid-Leuz et al., 2007). Because of this issue, some studies included verbal report of threat/distracter features or response latency to onscreen distracter displayed on opposite sides from threat during exposure (Mohlman & Zinbarg, 2000; Penfold & Page, 1999; Oliver & Page, 2003, 2008).

Third, symptom return at follow-up is one of the major issues exposure therapy is confronted with (Boschen, Neumann, & Waters, 2009). Emotional processing theory suggests that safety behaviors during exposure, like distraction, may increase the risk of relapse due to limited processing of threat during exposure. Whether distraction facilitates only temporary

symptom reduction, but has detrimental effects later on, can be assessed only at follow-up. Despite this importance of follow-up assessment, few studies performed follow-up to test the long-term efficacy of different forms of attention allocation during exposure (see Table 1).

In summary, when examining the effects of attention allocation to exposure efficacy it is important to consider the methodological issues presented here.

Overview of the Present Study

Despite an ongoing debate that dates back to more than 30 years ago (Grayson, Foa, & Steketee, 1982), up to now no meta-analysis has been published on the efficacy of distracted vs. focused exposure on anxiety related symptoms. Inconsistencies in the literature with respect to results, methodology, and distraction/attentional focus definitions, as well as increasing interest in the interplay between attention and exposure (McNally, 2007; Foa et al., 2006; Parrish et al., 2008) provide the impetus for the current meta-analysis. The present investigation sought to establish the relative efficacy of different attention allocation instructions during exposure on distress, physiological and behavioral symptoms related to anxiety experience by patients with specific phobia.

The purpose of the present study is twofold. *First*, the goal is to investigate differences in efficacy between focused exposure, distracted exposure, and uninstructed exposure (i.e., without any instruction about attention allocation) with respect to distress, behavior, and physiology by means of two by two comparisons at post exposure and follow-up. The key comparison in the current study is the one between exposure with focused attention and exposure with distracted attention. However, it is possible that both forms have a different efficacy compared to uninstructed exposure. Therefore, we added specific comparison between the attentionally instructed exposures and uninstructed exposure. *Second*, the goal is to investigate potential

moderators of the difference in efficacy between focused and distracted exposure with respect to distress, behavior, and physiology. Previous research and theory has suggested several potential moderators among which are the clinical status of the sample, level of interaction within distraction tasks, number of exposure sessions, and follow-up length (Craske et al., 2008; Foa et al., 2006). We are discussing these moderators below.

Clinical Status of the Sample. In order to consider either one of the forms of attention allocation during exposure relevant in clinical settings, it is necessary to see whether they reduce symptoms in clinical samples. In addition, there are studies indicating that healthy and clinical samples respond differently to attention allocation when exposed to threatening stimuli, meaning that healthy individuals process the threat stimulus less than clinical samples when distracted (Straube, Lipka, Sauer, Mothes-Lasch, & Miltner, 2011). This is also a potential moderator for theoretical reasons, as there is an extensive literature which shows a strong link between anxiety levels and attentional control in threatening situations (for a review, see Eysenck, Derakshan, Santos & Calvo, 2007). Hence, clinical samples may be less able to comply with attentional instructions. As attentional focus during exposure has been examined in clinical, as well as clinically-analogue samples, we can review whether clinical status moderates the efficacy of attentionally instructed/uninstructed exposure.

Level of interaction within distraction tasks. To illustrate the variability within distraction tasks, several studies used interactive distraction demands (e.g., patient-therapist communication on threat unrelated topics, see Table 1), or non-interactive distraction demands (e.g., listening to documentaries on headphones while counting key words with no interaction between patient and therapist, see Table 1). In pain related research this distinction is relevant, as interactive distraction is more effective than non-interactive distraction in terms of pain tolerance and pain

threshold (Wohlheiter & Dahlquist, 2013). It is plausible that the superior efficacy of interactive distraction as opposed to non-interactive distraction can be encountered in fear reduction literature, for two main reasons. First, interactive distraction is considered to be more clinically relevant, being frequently recommended by therapists in clinical practice (Penfold & Page, 1999). Second, several characteristics of interactive distraction are relevant to fear reduction. It requires ongoing stimulation (e.g., finding conversation arguments) and is more ecological than non-interactive distraction, mirroring real-life situations (e.g., a conversation). In contrast, non-interactive distraction might be more stressful in that it mimics evaluation related situations (e.g., the participant has to report, at the end of the exposure, the number of keywords identified in a recording). Noteworthy, interactive distraction provides an ongoing manipulation check over the course of the intervention, keeping the person constantly distracted during exposure (e.g., via conversation). As we have identified several studies using strategies varying in levels of interactivity, we can review whether interactive/non-interactive distraction moderates the efficacy of exposure under various attentional focus conditions.

Number of exposure sessions. The issue of single vs. multiple exposure sessions is well investigated in terms of efficacy. Öst, Brandberg, and Breitholtz (2001) have shown that, for some anxiety disorders, like specific phobia, multiple sessions are not necessarily superior to one session exposure with respect to fear reduction. However, for other anxiety disorders, multiple sessions are needed, as it has been argued that between-session habituation is necessary for recovery in anxiety disorders, like post-traumatic stress disorder (for review, see Craske et al., 2008). It is plausible that attentional focus has different effects within-session versus between exposure sessions. That is, distraction may initially lower within-session fear levels, but could

hinder emotion processing and thus be associated with smaller fear reduction between exposure sessions, making the number of sessions a potential moderator.

Follow-up length. Studies vary widely in the duration between post exposure assessment and follow-up. The issue of follow-up length in anxiety disorders is considered highly relevant as estimates suggest that up to 30% of individuals, depending on anxiety disorder, experience return of symptoms, predominantly fear (for review see, Craske & Mystkowski, 2006). In line with the impact that attentional focus may have in relation to the number of exposure sessions, the length of follow-up may also be important in showing differences between focused and distracted exposure at shorter relative to longer follow-up durations.

Method

Literature search

Potentially relevant studies were identified following a systematic search of the PsychInfo and Medline databases through September 2012, using the following keywords: "exposure-only'', "exposure alone", "attentional focus'', "distraction'', paired with "exposure", "anxiety", and "fear". We also systematically searched the references within the most recent articles (Oliver & Page, 2008; Schmid-Leuz et al., 2007), and reviews on the topic of attention allocation during exposure (McNally, 2007; Foa et al., 2006; Parrish et al., 2008).

Selection of studies

The search procedure led to the identification of 37 records (see Figure 1). After removing duplicates, the remaining studies were analyzed in detail for relevance based on their abstract. Following the exclusion of irrelevant publications (i.e., the screened abstracts indicated reviews related to the topic or lack of an exposure intervention in anxiety), a total of 29 potentially relevant articles were inspected for relevance based on their full-text. Only studies

fulfilling the following criteria were included into the meta-analysis: (a) assessed distress (i.e., fear, anxiety, subjective units of distress) and/or behavioral, physiological symptoms at post exposure and/or follow-up; (b) were English-language publications; (c) included samples with high anxiety or clinically diagnosed anxiety; (d) had sufficient data to compute between-group effect sizes; (e) participants were randomly assigned to at least two out of the three targeted experimental groups (i.e., focused, distracted, and/or uninstructed exposure) and (f) focus and distraction tasks were performed during exposure; (g) dealt with specific phobia. Fifteen articles satisfied the inclusion criteria (see Figure 1).

Moreover, the studies had to include standard therapeutic forms of exposure therapy. As such we did not include extinction studies, or eye-movement desensitization and reprocessing (EDMR) (Rogers & Silver, 2002). Random allocation to conditions was essential for between group comparisons. Therefore, crossover design studies were excluded to avoid potential carryover effects. Exposure paired with other forms of therapy or add-ons (e.g., breathing exercises) was discarded. Importantly, not all the remaining and included studies had the comparison of different forms of attention allocation during exposure as primary objective. We are discussing these cases below.

The majority of the selected studies compared target exposure groups against each other or against other conditions irrelevant to our purposes. In the latter case, we took into consideration only relevant data to our target interventions. For instance, Kamphuis and Telch (2000) compared uninstructed exposure to distracted exposure, exposure plus reappraisal, and distracted exposure plus reappraisal. Since exposure plus reappraisal or distracted-reappraisal was not within the focus of our review, we discarded these two conditions and kept data sets from uninstructed exposure and distracted exposure group.

There was one study in which focused exposure was not labeled accordingly. To be specific, Arntz and Lavy (1993) investigated elaboration of threat during exposure. As described by these authors, elaboration required attending, processing, and describing the features of the phobic stimulus. Because this procedure is similar to other attentional focus tasks (e.g., Oliver & Page, 2003, 2008), we included the elaboration task into the category of focused exposure.

Procedure

For each included study, we retained the following variables: study identification data (author, year of publication), mean age of the participants, percentage of female participants per study, number of participants per comparison, number of exposure sessions, session duration, clinical status of the sample, interactive/non-interactive distraction, follow-up length (in weeks), and outcome measures (see Table 1, as well as subsequent paragraphs for the coding of these variables).

Outcome measures were classified into one of the following three clusters:

Distress. Following Powers and Emmelkamp (2008), distress includes anxiety related-specific distress and general distress. This outcome includes self-reports of anxiety, fear related questionnaires, as well as situational and general distress estimates (see Table 2)

Behavior. The behavioral outcome included the level of behavioral approach (e.g., number of steps completed during the behavioral approach test, BAT) (see Table 2).

Physiology. Measures assessing physiological responding include: heart rate, skin conductance, systolic and diastolic blood pressure, self-reported blushing responses, and so on (see Table 2).

Moderators were classified into one of the following four clusters:

Clinical status of the sample. Since all the included studies had participants who experienced diagnosed or undiagnosed anxiety, we split this moderator into *clinical samples* (i.e., participants diagnosed with an anxiety disorder) and *analogue samples* (i.e., undiagnosed participants with elevated symptoms of anxiety).

Level of interaction within distraction tasks. We split this moderator into *interactive distraction* and *non-interactive distraction*. Interactive distraction involves patient-therapist communication on topics unrelated to the feared stimulus. In contrast, non-interactive distraction does not involve patient-therapist communication (e.g., listening to a documentary recording and counting key words).

Number of exposure sessions. Following Wolitzky-Taylor, Horowitz, Powers, and Telch (2008), we split the number of exposure sessions into *single exposure session* and *multiple exposure sessions* (i.e., two or more sessions).

Follow-up length. In the targeted distraction-focus studies, follow-up intervals ranged from 1 to 4 weeks (see Table 1). We split the follow-up interval into *less than one month* (i.e., varying from 1 to 3 weeks) and *one month,* which was based on inspection of the typical length of follow-up duration in the included studies. This decision is in line with other meta-analyses (e.g., Covin, Ouimet, Seeds, & Dozois, 2008), which also split the follow-up interval depending on the available follow-up range.

For effect size estimates we chose Hedges's *g*, a coefficient which controls for variations in sample size among studies (Hedges & Olkin, 1985). Just like the traditional Cohen's *d* coefficient, a value between 0.2-0.5 indicates a small effect size, a value between 0.5-0.8 indicates a medium effect size, and a value of 0.8 or larger points to a large effect size (Cohen, 1988). The effect sizes were coded so that in an uninstructed-distracted and uninstructed-focused

exposure pair a positive value points to a result in favor of uninstructed exposure, while in a distracted-focused exposure pair a positive value indicates results in favor of distraction. In order to view g scores in a more intuitive manner, we computed percentages for each main average effect size for distress, behavior, and physiology, as well as for significant moderation effects. Following McGough and Faraone (2009), we converted g scores into Cohen's d and related the resulting scores to the table of percentages depicted for each effect size. For instance, according to McGough and Faraone (2009), an effect size of 0.6 corresponds to a percentage of 73% (i.e., individuals in group X had higher/lower values than 73% of the individuals in group Y).

For each comparison per outcome, we computed two effect sizes, one at post exposure and one at follow-up. As for the calculation of effect sizes for distress, behavior, and physiology, the following data were used: means and standard deviations, when these were available; Cohen's *d* reported in the study; between-group *t* values and sample sizes; between group *p* values and degrees of freedom. In addition, when a study reported multiple outcomes per cluster (i.e., distress, behavior, or physiology cluster), we computed an average effect size of those outcomes at a given point in time (i.e., post-exposure and/or follow-up).

For all sets of computed effect sizes we followed the random effects model, which assumes that studies come from populations in which the effect size differs. To examine the degree to which effect sizes differ among studies, we tested for heterogeneity of effect sizes using the *Q* statistic and the I^2 statistic (Borenstein, Hedges, Higgins, & Rothstein, 2009). *Q* statistic is an index of the heterogeneity in effect sizes, comparing true heterogeneity to random error. A statistically significant *Q* pin points to a true heterogeneity in effect sizes beyond

random error. I^2 statistic is similar to Q statistic, but indicates the proportion of observed heterogeneity and, unlike *Q*, is not sensitive to the number of studies (Borenstein et al., 2009).

To address publication bias, we generated a funnel plot and visually inspected for publication bias. The underlying assumption of the funnel plot is that smaller effect sizes with smaller sample sizes are more susceptible to error. If a publication bias is present, the funnel plot will be asymmetrical, with studies clustered unevenly above or below the mean. In addition, we used Duval and Tweedie's trim-and-fill procedure (Duval & Tweedie, 2000) that approximates the probable number of missing studies that would correct for publication bias, computing an effect size without publication bias. These analyses, along with the rest of the examinations, were run using Comprehensive Meta-Analysis (Version 2.2.046; Borenstein, Hedges, Higgins, & Rothstein, 2005).

Results

Between-group analysis for distress

For brevity purposes, when comparing in a two-by-two manner distracted exposure, focused exposure, and attentionally uninstructed exposure, we abbreviated these contrasts to: uninstructed-distraction, uninstructed-focus and distraction-focus pair.

First, we computed average post exposure and follow-up effect sizes for distress in the distraction-focus pair considering data reported in 10 (N = 307) and 8 studies (N = 221), respectively. At both intervals, a study by Johnstone and Page (2004) had values exceeding 2 SDs above the average effect size and was, therefore, considered an outlier[1]. This study was excluded from further analysis. At both post (g = .242, p = .177, 95% CI = [-.110; .594]) and follow-up (g = .101, p = .721, 95% CI = [-.454; .656]) pooled effect sizes for distress indicated

[1] The results presented here did not differ significantly when the outlier was included.

no differences between conditions. Also, at post exposure, Q (8) = 17.241, p = .028, I^2 = 53.599, and follow-up, Q (6) = 21.693, p = .001, I^2 = 72.342, there was evidence of heterogeneity in results. There was no statistically significant difference between post exposure and follow-up average effect size for distress in the distraction-focus pair, Q (1) = 1.700, p =.192.

Second, we computed an average post exposure and follow-up effect size for distress in the uninstructed-distraction pair on data reported in 6 (N = 156) and 3 studies (N = 72). In both post and follow-up intervals there was no outlier. Results showed no significant difference in terms of distress between distraction and uninstructed condition at post exposure, *g* = -.088, p = .818, 95% CI = [-.831; .656] and follow-up, g = -.747, p = .248, 95% CI = [-2.016; .521]. There was evidence of heterogeneity at post exposure, Q (5) = 28.405, p < .001, I^2 = 82.398, and follow-up Q (2) = 15.065, p < .001, I^2 = 86.724. Also, there was no statistically significant difference between post exposure and follow-up average effect size for distress in the uninstructed-distraction pair, Q (1) = .748, p = .387.

Third, in terms of distress, we computed an average effect size for uninstructed-focus pair at post exposure (k = 4, N = 111) and follow-up (k = 3, N = 85). In the absence of outlying studies, pooled effect sizes indicated no significant differences between uninstructed and focused exposure with respect to distress at post exposure (g = .033, p = .894, 95% CI = [-.451; .517]) or follow-up (g = -.032, p = .875, 95% CI = [-.426; .363]). There was no evidence of heterogeneity, assessed for post exposure, Q (3) = 5.573, p = .134, I^2 = 46. 166, and follow-up, Q (2) = 1.218, p = .544, I^2 = .000. Also, there was no statistically significant difference between post exposure and follow-up average effect size for distress in the uninstructed-focus pair, Q (1) = .167, p = .683.

Moreover, subsequent analyses revealed no significant difference between the average effect size for distraction-focus, uninstructed-distraction, uninstructed-focus pairs with respect to distress at post exposure, $Q(2) = 1.942$, $p = .379$, or follow-up, $Q(2) = 2.440$, $p = .295$.

Between-group analysis for behavioral outcomes

With respect to behavior, we initially computed an average effect size for the distraction-focus pair at post exposure ($k = 5$, $N = 143$) and follow-up ($k = 3$, $N = 57$). There was no study outlying from the average effect size. At post exposure ($g = .672$, $p = .080$, 95% CI = [-.080; 1.425]) the average effect size was near significance and in favor of distraction, where participants in the distraction group tended to display better behavioral outcomes (i.e., less avoidance and more approach behavior) than 76% of those in the focus group. At follow-up ($g = 1.490$, $p = .008$, 95% CI = [.394; 2.586]), the average effect size was significant and in favor of distraction, where participants in the distraction group demonstrated better behavioral outcomes relative to 92% of those in the focus group. There was evidence of heterogeneity in post exposure, $Q(4) = 17.678$, $p = .001$, $I^2 = 77.373$, and follow-up behavioral results, $Q(2) = 6.610$, $p = .037$, $I^2 = 69.742$. No statistically significant difference between these time points was revealed in the distraction-focus pair, $Q(1) = 2.054$, $p = .152$.

Next, we computed the post exposure average effect size in the uninstructed-distraction pair on data extracted from 2 studies ($N = 54$). We could not compute an average effect size at follow-up on account of a lack of studies and data for this contrast pair. At post exposure, in the absence of outliers, the resulting medium effect size indicated a significant difference between uninstructed exposure and distraction in favor of uninstructed exposure, $g = .664$, $p = .017$, 95% CI = [.120; 1.206], meaning that participants in the uninstructed group had better behavioral

outcomes than 73% of those in the distraction group. There was no evidence of heterogeneity in results, Q (1) = .001, p = .970, I^2 = 0.000

Further on, we computed an average effect size for the uninstructed-focus pair at post exposure (k = 2, N = 67). We could not compute an average effect size at follow-up because of lack of studies and data for this contrast pair. The resulting small effect size (g = .289, p = .231, 95% CI = [-.184; 0.761]) was not significant and had no evidence of heterogeneity within results, Q (2) = .967, p =.326, I^2 = .000.

Moreover, subsequent analyses revealed no significant difference between average effect sizes for distraction-focus, uninstructed-distraction, uninstructed-focus pairs with respect to behavior at post exposure, Q(2) = 1.316, p = .518.

Between-group analysis for physiological outcomes

First, we computed average post exposure and follow-up effect sizes for physiology in the distraction-focus pair considering data reported in 7 (N = 237) and 6 studies (N = 177). At both intervals, there was no outlying study to be excluded from further analysis. At both post (g = -.276, p = .282, 95% CI = [-0.781; 0.228]) and follow-up (g = -.520, p = .168, 95% CI = [-1.259; 0.219]) pooled effect sizes for physiology indicated no differences between conditions. There was evidence of heterogeneity in results, at post exposure, Q (6) = 20.509, p = .002, I^2 = 70.745, and follow-up, Q (5) = 25.993, p =. 000, I^2 = 80.764. Results indicated no statistically significant difference between post exposure and follow-up in terms of average physiology effect sizes in the distraction-focus pair, Q (1) = .129, p = .720.

Second, since the majority of studies investigated physiological outcomes following distraction-focus comparison, we could contrast uninstructed-distraction pair at post exposure considering data reported in only 2 studies (N = 58). Results showed no significant difference in

terms of physiology between distraction and uninstructed exposure, g = .074, p = .772, 95% CI = [-0.428; 0.577]. There was no evidence of heterogeneity, Q (1) = .906, p = .341, I^2 = .000.).

We could not compute an average effect size for the uninstructed-focus pair at post exposure or follow-up on account of lack of physiological measurements for this constrast (see Table 1). Subsequent analyses revealed no significant difference between average effect sizes computed for distraction-focus and uninstructed-distraction pairs with respect to physiology at post exposure, Q(1) = .932, p = .334.

Moderators of distress outcome

We performed separate moderation analyses for post exposure and follow-up between-group effect sizes for distress, behavior and physiology in the distraction-focus pair, as this was the key comparison in the current study. In addition, there were too few studies per moderator category to contrast uninstructed exposure to distracted or focused exposure (see Table 1). Results from analyses with categorical moderators are displayed in Table 3 and 4.

The first moderator we took into account was the clinical status of the sample (analogue vs. clinical sample). In the distraction-focus pair, the clinical status did not moderate the effect size for distress in either dataset, post exposure or follow-up (see Table 3).

A second moderator was the number of exposure sessions (single vs. multiple sessions), which significantly moderated post exposure and follow up effect size for distress in the distraction-focus pair (see Table 3). At post exposure, in the multiple sessions condition, participants in the distraction group had lower levels of distress than 92% of those in the focus group. In the single session, distraction and focused exposure did not differ significantly (see Table 3). At follow-up, in the multiple sessions condition, participants in the distraction group reported lower levels of distress relative to 92% of those in the focus group. This was not the

case for the single session condition, where there was no significant difference between both groups (see Table 3).

A third moderator was the level of interaction within distraction tasks. This variable significantly moderated post exposure effect size for distress. Distraction was significantly superior to focus in terms of distress in the interactive condition, while in the non-interactive condition, there were no significant differences between both conditions (see Table 3). In the interactive condition, participants had lower distress levels than 84% of the individuals in the focus group.

Fourth, we tested follow-up interval length (i.e, less than one month and one month) as a moderator of distress. Follow-up length did not moderate effect sizes for distress in the distraction-focus pair (see Table 3).

Moderators of behavioral outcome

In terms of behavior, the first moderator we took into account was the clinical status of the sample. The clinical status did not moderate the effect size for behavior in either dataset, post exposure or follow-up (see Table 4).

A second moderator was the number of exposure sessions that significantly moderated post exposure effect size for behavioral outcome (see Table 4). Distraction significantly outperformed focused exposure in the multiple sessions condition, where individuals from the distraction group had better behavioral outcomes (i.e., less avoidance and more approach behavior) than 95% of the individuals in the focus group. In the single session condition, the difference between distracted versus focused exposure did not reach significance (see Table 4). The analysis could not be extended to follow-up on account of lack of diversity between studies

with respect to number of exposure sessions, meaning that the majority of studies had multiple exposure sessions (see Table 1).

A third moderator was the level of interaction within the distracting task. This variable significantly moderated post exposure effect size for behavioral outcome. That is, distraction was significantly superior to focus in terms of behavior for interactive tasks, while for non-interactive tasks there was no difference between distraction and focus (see Table 4). Furthermore, with interactive tasks, distracted exposure had better behavioral outcomes than 84% of the individuals in the focused exposure group. The analysis could not be extended to follow-up time interval or follow-up length moderator since there were too few studies (see Table 1).

Moderators of physiological outcome

Regarding the physiological outcome, on account of few studies and lack of variability among papers in terms of the investigated moderators (see Table 1), it was possible to perform moderation analysis only for level of interaction within distraction and follow-up length. Irrespective of the time of measurement, post exposure or follow-up, none of the investigated variables was a significant moderator of the physiological outcome (see Table 4).

Publication bias

To investigate the presence of publication bias we generated funnel plots, and computed Duval and Tweedie's (2000) trim-and-fill procedure using a random effects model. Publication bias analyses were carried out for distress, behavior, and physiology effect sizes at post exposure and follow-up in all the three investigated exposure contrasts.

For distress, in the distraction-focus pair, trim-and-fill procedure estimated no study with effects higher or lower than the mean which could modify the results at post-exposure. At follow-up, trim and fill estimated one study with an effect size higher than the mean which did

not change significantly the results, g = .280, 95% CI = [-.313; .874], Q = 30.419. In line with this result, the funnel plot showed asymmetry, suggesting the presence of missing studies with effect sizes above the mean and the possibility of obtaining under-inflated estimates of the true differences (see Figure 2A).

For behavior, in the distraction-focus contrast, trim-and-fill procedure estimated one study, at post exposure, with an effect size lower than the mean which did not change significantly the results, g = .443 95% CI = [-.326; 1.213], Q = 25.502. In line with this result, the funnel plot showed asymmetry, suggesting the presence of missing studies with effect sizes below the mean and the possibility of obtaining slightly inflated behavioral estimates for the distraction-focus pair (see Figure 3A). For the remaining contrasts, the presence of only two studies per condition implied that publication bias could not be investigated.

For physiology, at post exposure, the trim and fill procedure estimated one study with effect sizes above the mean, which did not change significantly the results, g = -.096, 95% CI = [-.645; .452], Q = 30.902. In line with this result, the funnel plot showed some asymmetry, suggesting the possibility of obtaining slightly under-inflated estimates of the true differences in physiology (see Figure 4A). At follow-up, two studies with effect sizes below the mean were estimated to reduce the effect size, g = -.925, 95% CI = [-1.693; -.157], Q = 48.677. The resulting funnel plot depicts some asymmetry suggesting the possibility of obtaining slightly inflated estimates of physiology in the distraction-focus pair (see Figure 5A). As was the case for behavior, the other two exposure contrasts cannot be investigated for publication bias because of lack of studies.

Discussion

The current meta-analysis aimed at investigating the efficacy of focused vs. distracted and uninstructed exposure on distress, behavioral, and physiological outcomes. We performed a quantitative review of 15 randomized studies that included post exposure and follow-up measurements. We made specific two by two comparisons between distracted, focused, and uninstructed exposure. Moreover, we examined potential moderators of differences in response to interventions (i.e., clinical status, number of sessions, level of interaction within distraction, and follow-up length).

Main effects

First, there were no differences in efficacy between focused and distracted exposure regarding distress and physiology at post-exposure or follow-up. The lack of significant differences between interventions indicates that distracted exposure is comparable to focused and uninstructed exposure in terms of distress and physiology. Thus, distraction may not be as detrimental to exposure as it has been suggested (Foa & Kozak, 1986; Foa et al., 2006). In addition, the lack of significant outcome differences (i.e., distress and physiology) between post exposure and follow-up stands contrary to views on distraction as a risk factor for symptom return (Foa & Kozak, 1986; Foa et al., 2006).

Second, there were significant and marginally significant differences between exposure pairs regarding behavioral outcomes. At post-exposure, results were marginally significant in favor of distracted as opposed to focused exposure, while at follow-up results significantly favored distraction. An explanation for these results might have to do with perceived control during exposure. This seems plausible as there are studies associating opportunities for behavioral approach and avoidance to perceived control (Schmid-Leuz et al., 2007; Oliver & Page, 2008). Therefore, distracted exposure might enhance perceived control and thus the

approach towards threat. Noteworthy, in the uninstructed-distraction pair, results for behavioral outcomes were in favor of the uninstructed group at post-exposure. Perhaps, in terms of approach behavior, it is important for the patients to be able to choose how to direct their attention. In the uninstructed exposure patients are free to select the attentional strategy which they find more helpful to approach a feared stimulus.

There was significant heterogeneity in several comparisons, which signals potential important moderators. Therefore, we specifically tested whether there were moderators of the efficacy of exposure under distraction or focusing instructions. These effects are discussed below.

Moderator effects

First, the number of exposure sessions was a significant moderator of distress and behavioral outcomes. For distress, in the multiple sessions' condition, distracted exposure significantly outperformed focused exposure at both time intervals. For behavior, in the multiple sessions' condition, exposure with distraction was superior to exposure with focus, directly after the intervention. The results are in line with previous meta-analyses (e.g., Cuijpers et al., 2010), a dose-response relationship, and early research in psychotherapy indicating that a larger number of sessions is related to larger symptom improvement (Howard, Kopta, Krause, & Orlinsky, 1986; Kopta, Howard, Lowry, & Beutler, 1994).

Second, with reference to the level of interaction within distraction, our results indicate that this variable was a significant moderator of the efficacy of distress and behavioral outcomes. Distracted exposure significantly outperformed focused exposure, in terms of behavior and distress, directly after treatment in the interactive condition. It may be that interactive distraction, which is a communication experience between patient and therapist, triggered pleasant emotions.

In turn, the positive emotions, experienced during stressful conditions, might have created the premises for counterconditioning. Alternatively, it may have to do with the nature of the task, meaning that interactive distracters (e.g., threat unrelated conversations) might have been more engaging and less stressful than the non-interactive distracters, which may have mirrored evaluation contexts (e.g., summarizing a documentary at the end of exposure).

Some of the expected moderators were not significantly associated with the efficacy of exposure under various attentional focus conditions. First, neither one of the outcomes was significantly moderated by clinical status and follow-up duration. One reason that these moderation models were not supported could be inadequate power due to the relatively small samples per condition. Second, none of the moderation analyses employed were significant for physiology. Again, this may have to do with the limited number of studies and the small diversity among studies in terms of the investigated moderators (see Table 1). As such, only two moderation analyses could be performed for this outcome. Alternatively, it may have to do with the nature of the outcome. Previous reports indicate that physiological measures do not always follow trends in other anxiety related outcomes (Alpers & Sell, 2008). Therefore, moderators for distress and behavior are not necessarily the same as the moderators for physiology.

Theoretical and clinical implications

From a *theoretical point of view*, our results may pose a challenge to current views on exposure where it is thought that distraction during exposure may prevent fear reduction. One surprising result is that distracted exposure was comparable to focused and uninstructed exposure in terms of distress and physiology (i.e., irrespective of the time of measurement). A second unexpected result is that distraction outperformed focus in terms of behavioral approach immediately after the intervention (i.e., via a marginally significant result) and at follow-up.

Furthermore, moderation results were interestingly in favor of distraction. Distraction outperformed focused exposure in the multiple sessions' condition (i.e., at both time intervals for distress and directly after exposure for behavior) and in the interactive distraction condition (i.e., at post-exposure for distress and behavioral outcomes). These results, along with the lack of theoretical explanations regarding the beneficial effects of distraction (Foa et al., 2006), might urge reconsideration of distraction's role in the efficacy of exposure, at least in comparison to focused exposure. Yet, results should be interpreted with caution when it comes to uninstructed exposure, as behavioral indexes seem to suggest that uninstructed exposure is the most effective.

There are two approaches that might help to reconsider the role of distraction during exposure. *First*, there is one critical issue that has been largely overlooked in the literature, which is how distraction is perceived by the patients. Depending on whether symptom reduction is attributed to distraction or not, distraction strategies may be harmful or beneficial. This issue has been raised in several previous studies (Parrish et al., 2008; Powers, Smits, Whitley, Bystritsky, & Telch, 2008) but has barely been investigated. *Second*, distraction's beneficial effect during exposure may have to do with reduced tendency to catastrophise about feared outcomes, which in turn may prevent maladaptive thinking. Although it may have slightly negative effects on threat processing, distraction could provide anxiety patients with an opportunity to stay in a feared situation without being overwhelmed by fear. More experimental studies are needed to test such hypotheses directly.

From a *clinical point of view*, our results indicate that as long as the exposure sessions are extended over multiple sessions and the distracter is interactive, distraction does not impede symptom reduction. In fact, there are indications that distraction could be useful, during the early stages of treatment, to facilitate engagement in sessions and long-term exposure exercises (for

review see Ellis, 2012; Rachman, Radomsky, & Shafran, 2008). Therefore, distraction research could change its current approach. Instead of comparing exposure with focus and distraction instructions, it would be interesting to examine to what extent and under what circumstances distraction is helpful in exposure. Also, to shed light on this matter, it might help for future studies to be more oriented on uninstructed-distraction comparisons. The present study provided indications that there were no differences between these conditions, in terms of physiology and distress. Yet, the uninstructed condition was superior to distraction in terms of behavior, directly after exposure, suggesting that attentionally unguided patients might find it more helpful to choose their attentional strategy when it comes to approaching threat.

Limitations and Future Directions

The present meta-analysis has several limitations related to the current state-of-affairs in this literature. *First* of all, there were a limited number of studies contrasting attentionally instructed exposure against uninstructed exposure with quite a lot of variety in methodology and results, which limited the conclusions that can be drawn from these contrasts. *Second*, we had no objective information regarding the amount of load imposed by the distracter on cognitive resources. This is an important drawback of the published research, to date, as less demanding distracters might allow for threat to be processed; while more demanding distracters could impede threat processing (e.g., Telch et al., 2004; Rodriguez & Craske, 1995). *Third*, cognitive outcomes could broaden the perspective on the efficacy of exposure in anxiety related symptoms. However, the lack of cognitive assessments within studies limits our meta-analysis to emotional, physiological and behavioral findings. *Fourth*, because the manipulation check for compliance with instructions is missing in most studies, the degree of attention allocation to and from threat couldn't be controlled for. This is similar to clinical practice, to which this article is addressed to,

where the client may or may not comply with the instructions provided by the clinician. *Fifth*, lack of manipulation check reflects also on the uninstructed exposure condition. Participants in an uninstructed group may still use focus/distraction strategies to manage their anxiety.

Furthermore, the current evidence are generalizable to specific phobias only. Previous studies indicate that specific phobia is not always representative for other anxiety disorders (Cuthbert et al., 2003). This disorder is supposed to have fear networks tightly associated to specific fear cues which might allow for a better fear activation and subsequent changes in the pathological components of the fear structure (Foa et al., 2006). Future studies, expanding attentional focus during exposure to other anxiety disorders, could shed light in this matter.

In addition to extending research to other anxiety disorders, future studies could: (a) endeavor to further refine distraction tasks to assess the amount of distraction that takes place during exposure; (b) investigate to what extent different types of distraction, like visual or cognitive, impede or not exposure mechanisms; (c) investigate whether distraction is present in some tasks of focused exposure, like patient-therapist conversation on threat related topics; (d) measure symptom reduction from a multilevel perspective; (e) examine whether distraction per se or attribution of recovery to distraction instead of exposure is counterproductive to therapy; (f) extend research to cognitive outcomes, like negative evaluation of the CS, a risk factor for return of fear (Dirikx, Hermans, Vansteenwegen, Baeyens, & Eelen, 2004); (g) include, during exposure, measurements of safety processing as potential mechanisms behind distraction efficacy. That is, if one is not that focused on one's feelings of anxiety, being in a fear-relevant situation might become associated with control (distraction can be seen as a form of mental control) and lower the expected levels of fear.

On the basis of these findings, the present meta-analysis suggests that distraction in contrast to focused exposure could be less counterproductive and even useful to exposure when distraction task is interactive and exposure is spread over the course of multiple sessions. From an *empirical perspective*, based on the current evidence, there are no indications that distraction would predispose to symptom return, challenging models of exposure. From a *clinical perspective*, the current results could lead to a reexamination of the role played by distraction in exposure therapy for specific phobia.

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Note: References marked with an asterix (*) mark articles included in the meta-analysis. In -text citations to studies selected for meta-analysis are not preceded by asterisks.

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Table 1. Characteristics of studies included in meta-analysis

Study	Mean Age	% of Female Participants	Exposure Pair	N Participants per Exposure Pair	Clinical Status	Interactive Non-Interactive Distraction	Follow-up Interval (weeks)	Number of exposure sessions (No.)	Exposure Duration in min. per Session	Outcome Measure
Antony et al., 2001	28.5	82.0%	**D-F**	60	diagnosed	Non-interactive		single session	60	SUDs, SPQ, BAT Steps, HR
Arntz and Lavy, 1993	32.5	100%	U-F	41	analogue		More than one month (52)	single session	150	SUDs, SPQ, Phobic Anxiety Scale
Johnstone and Page, 2004	17.5	96.3%	**D-F**	27	diagnosed	Interactive	One month (4)	multiple sessions (3)	10	FSQ, BAT-Steps, Diastolic/Systolic Blood Pressure, HR, SCL
Kamphuis and Telch, 2000	18.6	86.2%	U-D	28	analogue	Non-interactive	Less than one month (2)	single session	30	SFR, HR
Mohlman and Zinbarg, 2000	27.6	79.16	**D-F**	36	diagnosed	Non-interactive	One month (4)	single session	45	SFGQ, SPQ, HR
Oliver and Page, 2003	21.0	84.3%	U-D U-F **D-F**	24	analogue	Interactive	One month (4)	multiple sessions (3)	10	SUDS, MQ
Oliver and Page, 2008	18.1	94.0%	U-D U-F **D-F**	20	analogue	Interactive	One month (4)	multiple sessions (3)	10	MQ, BAT Steps*
Penfold and Page, 1999	18.7	75%	U-D U-F **D-F**	26	analogue	Interactive		single session	10	SUDs, BAT Steps
Rodriguez and Craske, 1995	18-21	85.0%	U-D	28	diagnosed	Non-interactive		single session	15	SFR, BAT Steps
Rose and		100%	**D-F**	20	diagnosed	Non-interactive	One month (4)	single	30	SUDs, SFR, HR, SC

McGlynn,1997.1[1]								session		
Rose and McGlynn,1997.2[2]		100%	**D-F**	19	diagnosed	Non-interactive	One month (4)	single session	30	SUDs, SFR, HR, SC
Schmid-Leuz et al., 2007	35.0	55.5%	**D-F**	63	diagnosed	Interactive	Less than one month (1)	single session	60	SUDs, DAS, STAI-S, STAI-T, HR
Telch et al., 2004	18.9	83.0%	U-D	30	analogue	Non-interactive		single session	30	VAS Peak Fear, HR
Wood and McGlynn,2000.1[1]			**D-F**	12	analogue	Non-interactive	Less than one month (1)	single session	30	SUDs, HR
Wood and McGlynn,2000.2[2]			**D-F**	10	analogue	Non-interactive	Less than one month (1)	single session	30	BAT Steps

Notes: [1] = study 1; [2] = study 2; *= BAT steps data available only for D-F comparison; U-D = uninstructed-distraction; U-F = uninstructed-focus; D-F = distraction-focus; BAT = Behavioral Approach Task; DAS = Dental Anxiety Scale (Corah, 1969); FSQ = Fear of Spiders Questionnaire (Szymanski & O'Donohue, 1995); HR = Heart Rate; MQ = Mutilation Questionnaire (Klorman, Weerts, Hastings, Melamed, & Lang, 1974); SC = Skin Conductance; SCL = Skin Conductance Level; SFGQ = Spider Fears Generalization Questionnaire (Craske, Mohlman, Yi, Glover, & Valerie, 1995); SFR = Subjective Fear Rating; SPQ = Spider Phobia Questionnaire (Klorman et al., 1974); STAI -S/ STAI-T = State-Trait Anxiety Inventory-State/State-Trait Anxiety Inventory-Trait (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983); SUDs = Subjective Units of Discomfort Scale (Wolpe, 1958); VAS = Visual Analogue Scale.

Table 2. Coding categories for dependent measures: distress, physiological, and behavioral outcomes

Domain	Measure
Distress	SUDS; SPQ; FSQ; SFGQ; MQ; DAS; Phobic Anxiety Scale; VAS Anxiety; SFR; STAI-S; STAI-T; VAS Peak Fear
Physiology	HR; SC; SCL; Diastolic/Systolic blood pressure
Behavior	BAT Steps

Notes. BAT = Behavioral Approach Task; DAS = Dental Anxiety Scale (Corah, 1969); FSQ = Fear of Spiders Questionnaire (Szymanski & O'Donohue, 1995); HR = Heart Rate; MQ = Mutilation Questionnaire (Klorman, Weerts, Hastings, Melamed, & Lang, 1974); SC = Skin Conductance; SCL = Skin Conductance Level; ; SFGQ = Spider Fears Generalization Questionnaire (Craske, Mohlman, Yi, Glover, & Valerie, 1995); SFR = Subjective Fear Rating; SPQ = Spider Phobia Questionnaire (Klorman et al., 1974); STAI -S/ STAI-T = State-Trait Anxiety Inventory-State/State-Trait Anxiety Inventory-Trait (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983); SUDs = Subjective Units of Discomfort Scale (Wolpe, 1958); VAS = Visual Analogue Scale.

Table 3. Moderation analysis with categorical variables for distress at post exposure and follow-up (FU)

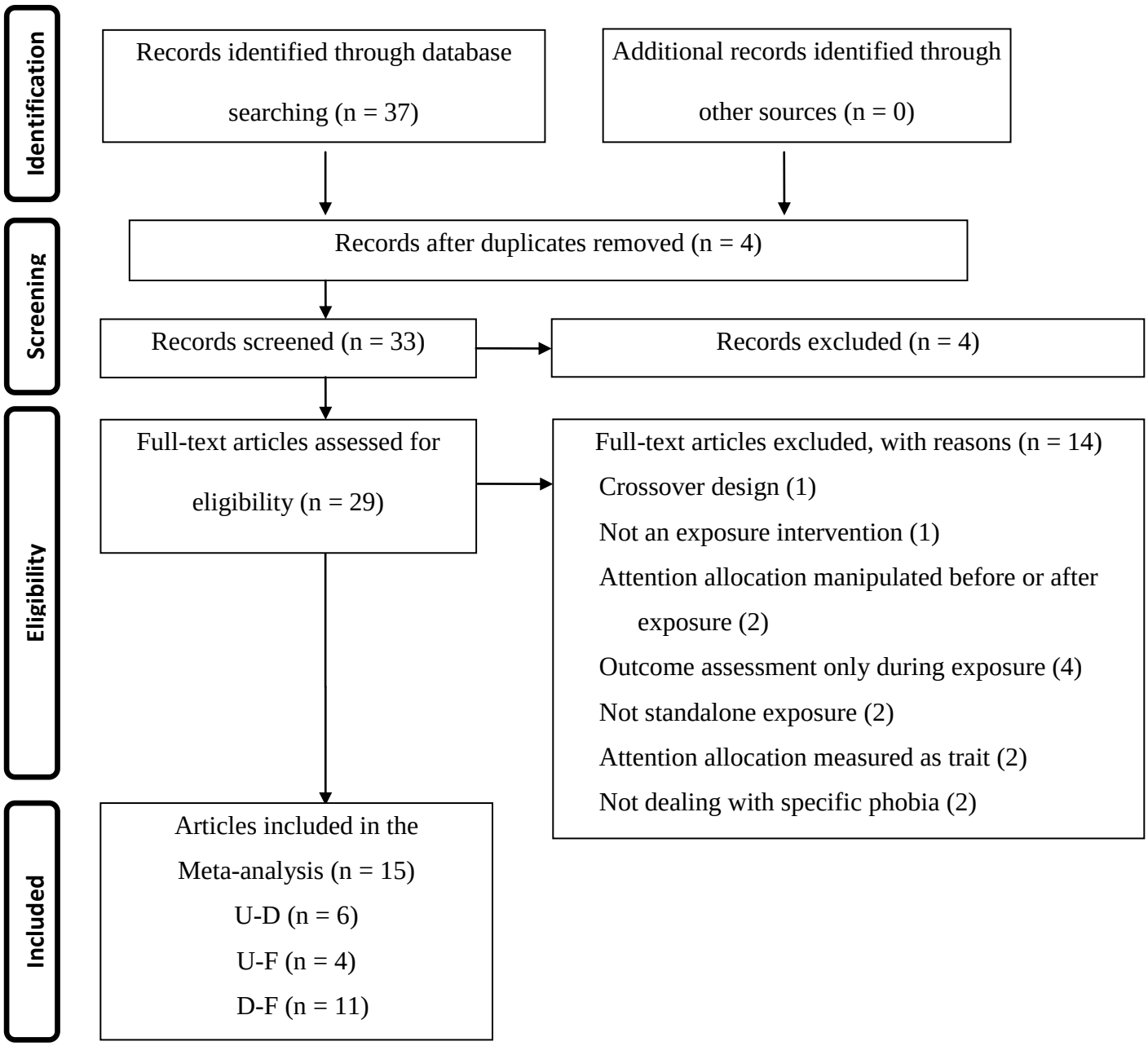
Outcome	Time of measurement	Moderator	Condition	N	g	p	Q w	p	CI	Q b	p
Distress	Post	Analogue/ Clinical Sample	D-F	4	0.434	0.322	12.127	0.007	[-0.426;1.294]	0.001	0.989
				6	0.427	0.170	23.881	0.000	[-0.183;1.037]		
	FU		D-F	3	0.342	0.637	14.479	0.001	[-1.081;1.756]	0.000	0.991
				5	0.351	0.402	23.373	0.000	[-0.471;1.173]		
	Post	Single/ Multiple Sessions	D-F	7	0.057	0.684	6.869	0.333	[-0.218;0.333]	8.099	0.004
				3	1.527	0.002	7.594	0.022	[0.553;2.501]		
	FU		D-F	5	-0.237	0.175	4.367	0.359	[-0.579;0.105]	15.124	0.000
				3	1.519	0.000	5.395	0.067	[0.703;2.335]		
	Post	Interactive/ Non-Interactive	D-F	5	1.010	0.010	21.524	0.000	[0.242;1.778]	6.147	0.013
				5	-0.062	0.736	4.741	0.315	[-0.420;0.297]		
	FU		D-F[a]	3	0.647	0.205	12.301	0.002	[-0.349;1.624]	2.688	0.101
				4	-0.296	0.266	4.316	0.229	[-0.817;0.225]		
	FU	Less than one month/One Month F.U.	D-F[a]	2	-0.665	0.259	3.397	0.065	[-1.820;0.490]	2.528	0.112
				5	0.394	0.205	11.624	0.020	[-0.215;1.003]		

Notes. D-F = distraction-focus; [a] One outlier (Johnstone and Page, 2004) was excluded from the analyses presented here.

Table 4. Moderation analysis with categorical variables for behavior and physiology at post exposure and follow-up (FU)

Outcome	Time of measurement	Moderator	Condition	N	g	p	Q w	p	CI	Q b	p
Behavior	Post	Analogue/ Clinical Sample	D-F	3	0.647	0.135	4.876	0.087	[-0.201;1.495]	0.011	0.916
				2	0.750	0.396	12.202	0.000	[-0.981;2.481]		
	Post	One session/ Multiple sessions	D-F	3	0.032	0.873	0.716	0.699	[-0.359; 0.423]	16.913	0.000
				2	1.606	0.000	0.048	0.826	[0.965; 2.246]		
	Post	Interactive/ Non Interactive	D-F	3	1.128	0.016	6.995	0.030	[0.208;2.049]	5.142	0.023
				2	-0.061	0.792	0.130	0.718	[-0.520;0.397]		
Physiology	Post	Interactive/ Non Interactive	D-F	2	-0.759	0.315	8.057	0.005	[-2.240;0.722]	0.677	0.411
				5	-0.094	0.741	10.659	0.031	[0.653;0.465]		
	FU		D-F	2	-0.703	0.366	9.548	0.002	[-2.227;0.299]	0.322	0.570
				4	-0.233	0.408	5.028	0.170	[-0.554;0.821]		
	FU	Less than one month/ One Month F.U.	D-F	2	0.072	0.750	0.130	0.719	[-0.785; 0.319]	2.478	0.115
				4	-0.877	0.117	19.219	0.000	[-1.973; 0.219]		

Notes. D-F = distraction-focus.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Screening
Eligibility
Included
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Additional records identified through other sources (n = 0)
Records after duplicates removed (n = 4)
Records screened (n = 33)
Records excluded (n = 4)
Full-text articles assessed for eligibility (n = 29)
Full-text articles excluded, with reasons (n = 14)
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Not an exposure intervention (1)
Attention allocation manipulated before or after exposure (2)
Outcome assessment only during exposure (4)
Not standalone exposure (2)
Attention allocation measured as trait (2)
Not dealing with specific phobia (2)
Articles included in the Meta-analysis (n = 15)
U-D (n = 6)
U-F (n = 4)
D-F (n = 11)

Figure 1.

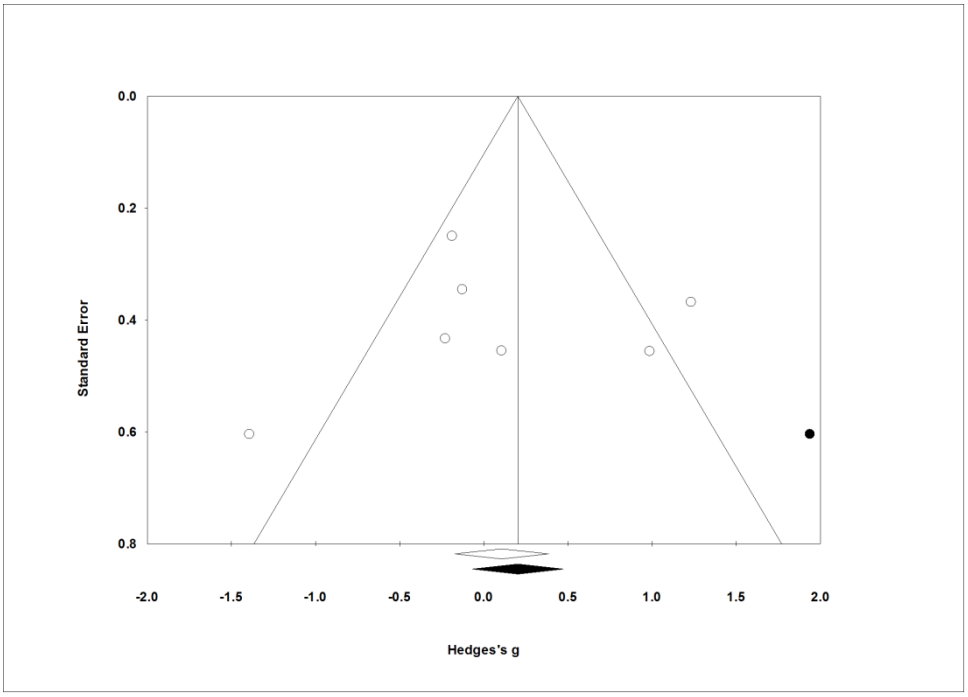
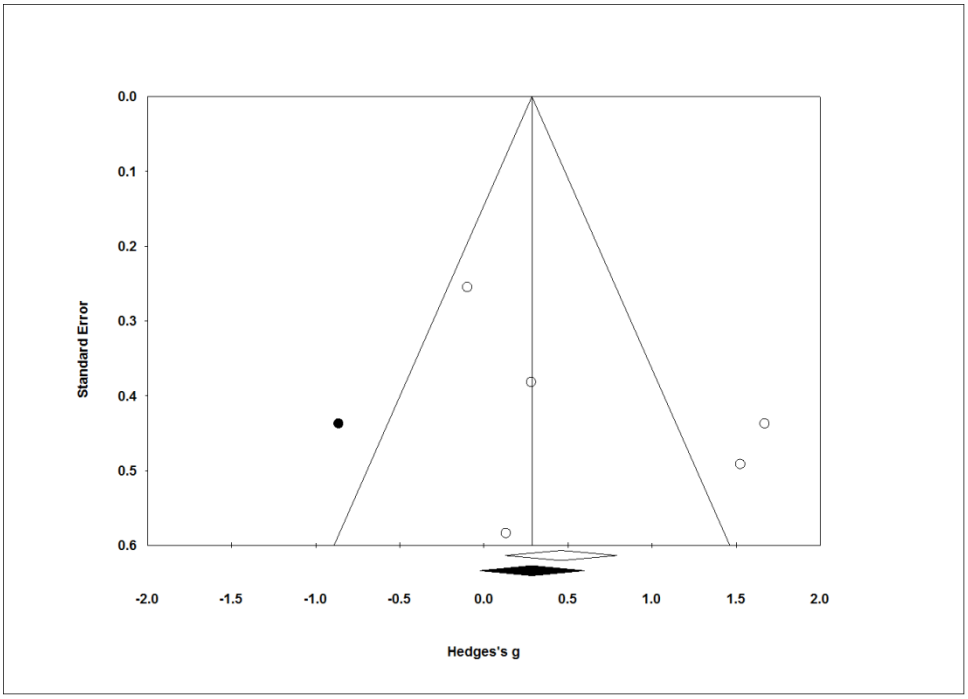


Figure 2A.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Hedges's g

Figure 3A.

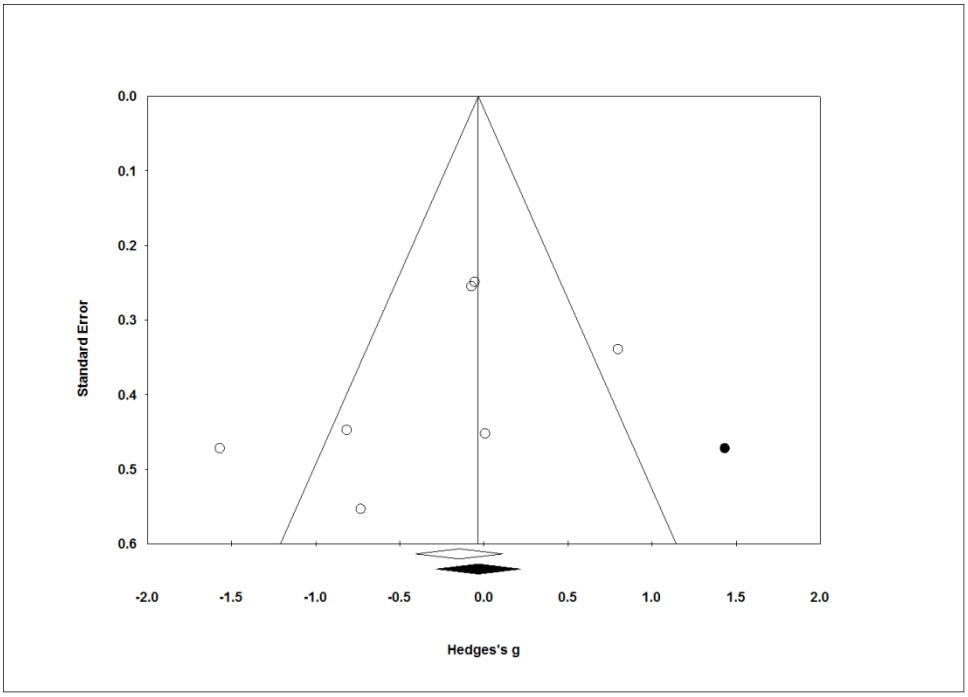
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Figure 4A.

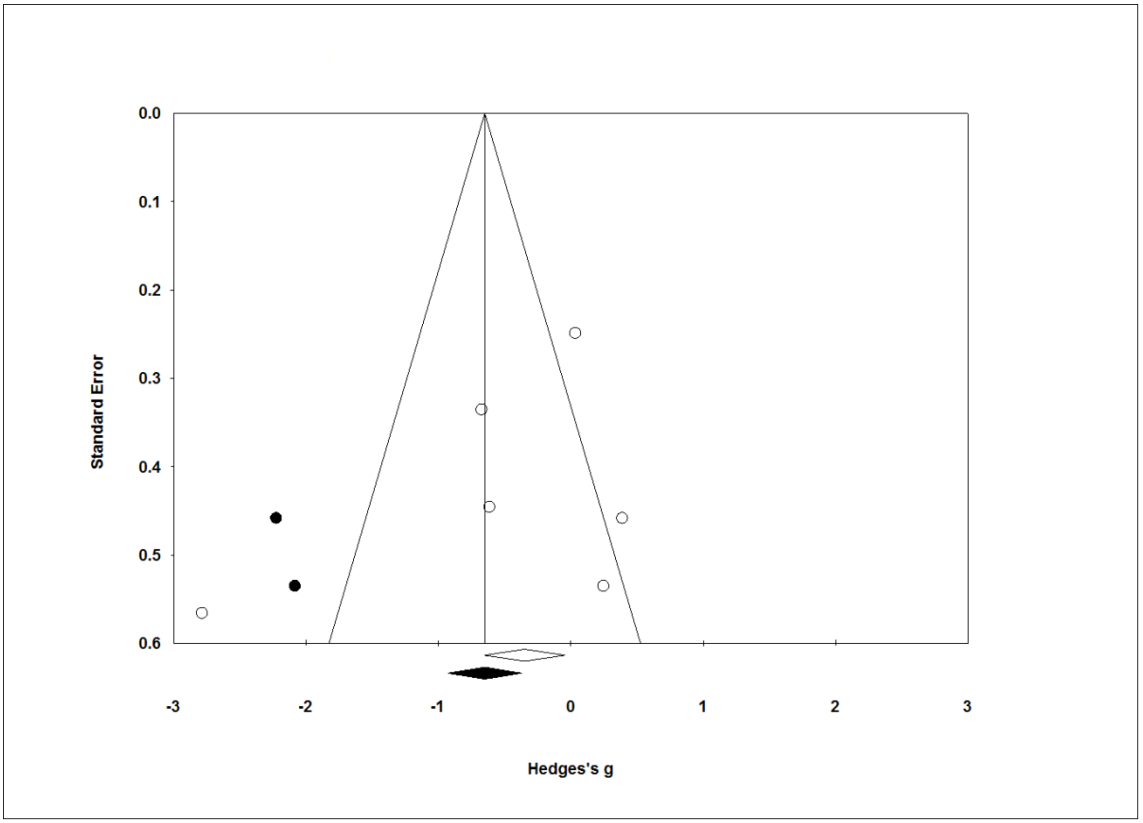

Figure 5A.

Figure Captions

Figure 1. Flow diagram. Flow diagram of study selection process.

Figure 2A. Funnel plot of publication bias. Funnel plot of publication bias for distress follow-up effect size in the distraction-focus contrast.

Figure 3A. Funnel plot of publication bias. Funnel plot of publication bias for behavioral post exposure effect size in the distraction-focus contrast.

Figure 4A. Funnel plot of publication bias. Funnel plot of publication bias for physiology post exposure effect size in the distraction-focus contrast.

Figure 5A. Funnel plot of publication bias. Funnel plot of publication bias for physiology follow-up effect size in the distraction-focus contrast.