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THE ROLE OF ENGAGEMENT ACROSS CONCEPTUALLY DISTINCT TREATMENT ELEMENTS FOR SOCIAL ANXIETY DISORDER

By

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THE ROLE OF ENGAGEMENT ACROSS CONCEPTUALLY DISTINCT TREATMENT ELEMENTS FOR SOCIAL ANXIETY DISORDER

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University of Nebraska, 2012

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There are currently several efficacious treatments for social anxiety disorder (e.g. exposure therapy and cognitive therapy). Each of these treatments is thought to reduce symptoms of social anxiety by disrupting maintenance mechanisms of the disorder, yet mechanism of change research has not supported this view. The current study compared components from each therapy modality in order to better understand why symptoms reduce similarly between conceptually distinct treatments. Participants with high social anxiety were randomly assigned to give a speech with cognitive restructuring and engagement-enhancing procedures, cognitive preparation and video feedback, or a speech alone. Self-ratings of speech performance, confidence in public speaking, and cost and probability biases were measured at three time points (baseline, post-speech, and post-intervention). Self- and observer-ratings of engagement, peak anxiety, and speech quality were also gathered post-speech. Results indicated instructions designed to boost engagement were not successful, though self-rated engagement across all conditions was strongly related to symptoms improvement. All interventions, despite having distinct procedural elements, were not significantly different from each other in terms of the pattern of change or strength of symptom reduction. Self-ratings did not come into line with third-party observers, despite improvements in cognitive biases. Results regarding the role of engagement across treatments and the hypothesis that both behavioral and

cognitive therapies for social anxiety function for similar reasons are discussed. Treatment implications, limitations of the study, and suggestions for future research are also discussed.

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CHAPTER 1: INTRODUCTION

1.1. DSM-IV-TR Symptoms of Social Anxiety Disorder

Social anxiety, an experience of fear and distress in interpersonal or performance situations, occurs commonly for many people, especially during novel interactions or personally important situations. While most people experience this fear and distress to some extent, it does not typically cause significant impairment in functioning. Due to distinct differences from traditional phobias and in order to highlight social anxiety's existence on a continuum, this disorder is now commonly referred to as social anxiety disorder (American Psychiatric Association, 2001, DSM-IV-TR).

1.2. Cognitive-Behavioral Classification of Symptoms

Symptoms of social anxiety are typically classified into three core domains: cognitive, physiological, and behavioral symptoms. Cognitive symptoms include both cognitions and informational processing biases that occur when facing anxiety-provoking situations. In comparing socially anxious individuals to nonanxious controls, more negative thoughts and fewer positive thoughts are typically found (Dodge, Hope, Heimberg, & Becker, 1988; Glass & Furlong, 1990; Turner et al., 1986), a greater likelihood of negative events occurring is predicted (Lucock & Salkovskis, 1988; Foa, Franklin, Perry, & Herbert, 1996), and unrealistically high standards for their performance in social situations are reported (Lundh & Öst, 1996). While experiencing social anxiety, individuals report concerns about the opinions of others, distress over the experience of anxiety itself, and expectations of poor performance and outcomes (Hope, Burns, Hayes, Herbert, & Warner, 2010). Specific cognitive biases, including attention toward threatening environmental stimuli (e.g. Hope, Rapee, Heimberg, & Dombeck,

1990) and inaccurate interpretations of the outcome of social situations (e.g. Amir, Foa, & Coles, 1998) have also been reported. Physiological symptoms within social anxiety disorder are similar to those seen in other anxiety disorders and include rapid heart rate, muscle tension, sweating, and other sympathetic nervous system responses. In the interpretation of these symptoms, socially anxious individually tend to assume these symptoms are more visible to others than objective observers report and indicative of extreme anxiety (Roth, Antony, & Swinson, 2001). Behavioral responses include general avoidance of anxiety-provoking situations, observable symptoms of anxiety, and safety behaviors. Safety behaviors are described by Clark and Wells (1995) as subtle avoidance strategies individuals utilize to reduce immediate levels of anxiety, including such behaviors as reduced eye contact, tightening muscles to prevent tremors, and avoiding the most threatening stimuli in a situation. While individuals perceive these behaviors as reducing their anxiety in the short-term, researchers hypothesize they actually reduce performance at the task at hand (Norton & Hope, 2001b), paradoxically increase experienced anxiety, and maintain apprehensive anxiety regarding future situations (Wells et al., 1995; McManus, Sacadura, & Clark, 2008).

1.3. Prevalence and Impairment

Social anxiety disorder is currently estimated to be the fourth most common psychiatric disorder, after major depressive disorder, alcohol abuse, and specific phobia (Kessler et al., 2005; Ruscio et al., 2008). The most recent National Comorbidity Survey replication found a lifetime prevalence of 12% and twelve-month prevalence of 7.1% (Ruscio et al., 2008). While social anxiety disorder was once considered rarely incapacitating (DSM-III-R; American Psychiatric Association, 1987), it is now known to

be associated with impairments extending beyond social/evaluative concerns. An early study by Turner, Beidel, Dancu, and Keys (1986) found that high percentages of individual with social anxiety disorder reported that their functioning in academics and occupation had been hindered by their social anxiety. In comparison to the general population, individuals with social anxiety disorder report significantly more impairment in social functioning and general mental health (Simon et al., 2002). Symptoms of social anxiety typically manifest themselves early in life (Beidel, 1998) and spontaneous remission is atypical (e.g. Degonda & Angst, 1993; Kessler et al., 2005).

1.4. Summary of Efficacy of Psychosocial Treatments

Given the chronic nature of social anxiety disorder, high levels of impairment typically observed, automatic activation of symptoms in the presence of anxiety-provoking stimuli, and pervasive use of safety behaviors, it is impressive that multiple meta-analytic studies have shown several psychosocial treatment approaches to be effective in significantly reducing symptoms of social anxiety in both research and community-based settings (e.g. Chambless & Hope, 1996; Fedoroff & Taylor, 2001; Feske & Chambless, 1995; Hofmann & Smits, 2008; Powers, Sigmarsson, & Emmelkamp; 2008). These cognitive-behavioral treatments include various combinations of therapeutic exposure, less formal behavior experiments, cognitive therapy, and social skills training. Interpersonal therapy has more recently been applied to social anxiety with limited success (Lipsitz et al., 2008), as has an attention training paradigm with minimal therapist intervention (Schmidt, Richey, Buckner, & Timpano, 2009). Despite consistent findings that a majority of these treatments are efficacious and result in clinically significant changes, substantial proportions of study participants are classified

as treatment non-responders (e.g. Heimberg, Liebowitz, Hope, Schneier, Holt, Welkowitz, et al., 1998). Among the treatment studies examining variables predicting non-response in social anxiety treatment, preexisting levels of anger (Erwin & Heimberg, 2003), depression (Chambless, Tran, & Glass, 1997), and lower ratings of treatment expectancy (Chambless et al., 1997; Safren, Heimberg, & Juster, 1997) have been associated with poorer outcome on some measures of social anxiety. This suggests that behaviors reducing an individual's commitment and participation in therapy may interfere with the ability of established treatments to exert beneficial effects. Additionally, despite extensive treatment literature and numerous metaanalytic reviews, surprisingly little is known about mechanisms that drive treatment effects. It is essential to understand mechanisms that contribute to effective interventions as well as to identify factors preventing these mechanisms from functioning in treatment non-responders, in order to continue to refine treatment approaches.

1.5. Past Mechanisms of Change Research

There are several distinct approaches to treat social anxiety disorder and each will be discussed in depth below. The most popular treatment modality is exposure plus cognitive restructuring, whether in group (Heimberg & Becker, 2002) or individual format (Hope, Heimberg, & Turk, 2010). Clark's (1997) cognitive therapy, though not widely disseminated, has shown promising initial results, while interpersonal therapy (IPT) has somewhat lower effect sizes (e.g. Lipsitz et al., 2008; Borge, Hoffart, Sexton, Clark, Markowitz, & McManus, 2008). Each of these treatments identifies conceptually distinct targets for therapeutic change, which are typically viewed as maintaining factors for the disorder. As such, the mechanism of change should be specific to each treatment.

However, multiple, distinct pathways to clinical change have not been seen in treatment process studies to date. As will be discussed below,, similar therapeutic change appears to occur independent of treatment modality (e.g. Hoffart, Borge, Sexton, & Clark, 2009), and not according to hypothesized mechanisms (e.g. Salkovskis, Hackmann, Wells, Gelder, & Clark, 2007; McMillan & Lee, 2010). In light of evidence suggesting common patterns of changes across treatments, as well as treatments not effecting symptom reduction as hypothesized, it is necessary to investigate whether current methods share a common underlying mechanism of change, such that the varying degrees of efficacy seen in treatment studies are reflective of how efficient and effective each is in activating this common pathway. If this is the case, treatment refinement would benefit from utilizing components targeting this common pathway, regardless of the particular orientation of the component.

1.6. Empirically-Based Psychosocial Treatments

As previously discussed cognitive-behavioral treatments identify conceptually distinct targets for therapeutic change, which are typically viewed as maintaining factors for the disorder. The dominant treatment modalities—CBT, specifically exposure plus cognitive restructuring (Heimberg & Becker, 2002), and Cognitive Therapy (Clark, 1997)—are based on distinct conceptualizations of social anxiety and purport to effect change in specific ways.

1.6a. Exposure-Based CBT

Exposure therapy is based on the concept that social anxiety represents strong associations between social situations and fear responses. These associations are maintained by repeated avoidance of these situations. It was originally based on

Mowrer's two-factor, two-process theory of conditioning models (1947), which is based on several assumptions. First, it posited that emotional responses were classically conditioned via the autonomic nervous system, while skeletal responses could be learned instrumentally via the central nervous system. It hypothesized that when individuals are faced with anxious arousal patterns, they engage in behaviors aimed at reducing the duration or intensity of this state. If the immediate anxiety is reduced, the behavior becomes more likely to be repeated in future situations due to classical conditioning. Chronic anxiety is seen as the result of some degree of avoidance being conditioned to the anxiety-provoking stimuli. Due to this avoidance, individuals do not learn that the situations are not, in fact, as threatening as they fear. Rapee and Heimberg (1997) provide an updated conceptualization of social anxiety, of which current exposure-based CBT is based. This model emphasizes the role of attention and maladaptive processing of information in maintaining social anxiety. In it, individuals with social anxiety engage in a complex process by which they allocate attentional resources to threatening stimuli in both their environment (angry faces) and themselves (symptoms of anxiety). These stimuli are integrated with a mental representation of the individual as seen by the audience. This mental representation is then compared against what the individual thinks the audience expects, and the probability and cost of negative evaluation is then considered. The end result is enhanced cognitive, behavioral, and physical symptoms of anxiety. Furthermore, because these resulting symptoms are often perceived as evidence of failure, increased anticipatory anxiety and avoidance of similar situations in the future is typically seen.

Individuals with social anxiety disorder are instructed to approach feared situations and remain in them until they experience a natural reduction in anxiety symptoms to disrupt this dysfunctional cycle of anxiety and avoidance. It is thought that by experiencing reductions in anxiety without avoidance behaviors and in an absence of feared outcomes, previous fears are reevaluated and adjusted to more functionally appropriate levels. Exposure treatments have historically focused on decreasing this avoidance of feared situations through the use of imaginal and *in vivo* exposures. The use of exposure has consistently shown superior effects to waitlist controls (for full review see Powers, Sigmarsson, & Emmelkamp, 2008). Efforts have been made to augment the effects of exposure with anxiety management (Butler, Cullington, Munby, Amies, & Gelder, 1984), social skills training (e.g. Alden, 1989; Turner, Beidel, & Cooley-Quille, 1995; Herbert, Gaudiano, Rheingold, et al., 2005) and, most commonly, cognitive restructuring (e.g. Mattick, Peters, & Clark, 1989; Heimberg & Becker, 2002). As meta-analyses comparing these various treatment augmentations have typically resulted in incremental, nonsignificant increases in effect sizes (e.g. Powers, Sigmarsson, & Emmelkamp, 2008), exposure is generally thought to be the most important component in treatment.

Most current exposure-based interventions do utilize a cognitive component aimed at correcting distorted cognitions regarding the feared situations and replacing them with adaptive cognitions, based on Beck's model (Beck, Emery, & Greenberg, 1996). The most studied combined cognitive plus exposure treatments is Heimberg's cognitive behavioral group therapy for social anxiety disorder (CBGT; Heimberg & Becker, 2002). Heimberg, Becker, Goldfinger, and Vermilyea (1985) showed that

CBGT, comprised of imaginal exposure, performance-based exposure during session, cognitive restructuring, and homework involving exposures practiced in group resulted in significant reduction in several measures of anxiety, which were maintained six months later for a majority of participants. In comparing CBGT to a credible attention control group involving education and support, Heimberg, Dodge, Hope, Kennedy, Zollo, and Becker (1990) found that while both groups improved significantly on multiple measures, the CBGT group improved more on several measures as well as being rated as more improved six months later. This difference was attributed to continued improvement on positive and negative self-statements and may have reflected continued use of coping strategies learned in CBGT. At follow-ups conducted between four and six years post treatment, gains made by individuals who completed CBGT show adequate stability with anxiety ratings by the individuals, independent raters, and behavior test judges being closer to non-anxious controls than those who completed the control condition (Heimberg, Salzman, Holt, & Blendell, 1993). In a large study of 133 individuals randomly assigned to CBGT, phenelzine (an MAOI), a pill placebo, or a credible control (educational-supportive group therapy), both CBGT and phenelzine had higher proportions of responders at the end of treatment than the two control conditions, though they were not significantly different from each other (Heimberg et al., 1998).

Although the group format was originally thought to be important to provide opportunities to practice exposures, other studies have shown group and individual therapy have similar efficacy (e.g., Lucas & Telch, 1993). The primary advantage of group therapy is cost-effectiveness (Scholing & Emmelkamp, 1993) and availability of role-play partners. However, since many non-research settings have insufficient client

flow for group treatment, CBGT has been adapted to an individual format (Hope, Heimberg, Juster & Turk, 2004; Hope, Heimberg, & Turk, 2010). In a comparison of the individual treatment based on the first edition of the manual (Hope, Heimberg, & Turk, 2006; Hope, Heimberg, Juster & Turk, 2004) to wait list controls, individual CBT showed large treatment effects that were maintained at three month follow-ups (Ledley et al., 2009).

Rodebaugh, Holaway, and Heimberg (2004) identified five meta-analyses (Feske & Chambless, 1995; Chambless & Hope, 1996; Fedoroff & Taylor, 2001; Gould, Buckminster, Pollack, Otto, & Yap, 1997; Taylor, 1996) that examined the effect sizes of cognitive behavioral treatment for social anxiety, including cognitive restructuring with and without exposure, social skills training, and/or applied relaxation. Moderate to large controlled effect sizes were found when CBT was compared to wait-list controls in these studies. Similarly, moderate to large uncontrolled effect sizes were found when comparing active treatments. Furthermore, treatment gains were maintained at follow-up assessments, between 2 and 12 months following treatment completion. No differences were found between the individual and group treatment (Fedoroff & Taylor, 2001; Gould et al., 1997; Taylor, 1996). There is some evidence that some versions of CBT without exposure, including social skills training, cognitive restructuring, or applied relaxation, result in nonsignificantly smaller effect sizes when compared to cognitive restructuring combined with exposure (Fedoroff & Taylor, 2001; Gould et al., 1997; Taylor, 1996). Rodebaugh, Holaway, and Heimberg (2004) point out that the nonsignificant differences may be due to insufficient power in these comparison studies.

From these studies it becomes clear that CBT, whether as an individual or a group treatment, is an effective treatment for social anxiety disorder. Since dismantling studies of CBT indicate that exposures are the most important part of CBT (Hope, Heimberg, & Bruch, 1995), the usefulness of added cognitive restructuring should be challenged. Evidence from individual clinical studies is inconsistent. Earlier studies by Mattick and Peters (1988) and Mattick, Peters, and Clarke (1989) indicate that cognitive restructuring, when used with exposure, is associated with improvement of symptoms at follow-up, more improvement on measures of irrational beliefs and negative self-evaluation, and the most improvement on behavioral assessments,. Meta-analyses, while demonstrating exposure with and without the cognitive component results in large effect sizes, do not show CBT to be superior to exposure alone (Fedoroff & Taylor, 2001; Feske & Chambless, 1995; Gould at al., 1997; Powers, Sigmarsson, & Emmelkamp, 2008). Additionally, while Taylor (1996) found that CBT tends to show the largest effect size, Powers, Sigmarsson, & Emmelkamp (2008) found exposure alone produced the largest effect size. Regardless, the general consensus is that exposure is a key aspect of treatment for social anxiety disorder and likely the most potent aspect of the combined treatment packages. Cognitive interventions, while not reliably affecting outcome measures, may be useful for other reasons, such as enhancing client engagement throughout treatment and reducing the chance of clients downplaying successes.

More recently, efforts have been made to enhance the effectiveness of exposure therapy with the use of D-cycloserine (DCS), which is thought to aid in consolidation of new memories in animal models (Davis, Ressler, Rothbaum, & Richardson, 2006). Hofmann et al. (2006) conducted a randomized, double-blind placebo-controlled trial

comparing individuals with social anxiety disorder who were either administered DCS or placebo prior to exposure sessions. Results indicated participants who received DCS had significantly greater reduction in social anxiety symptoms than individuals in the exposure only group, with few adverse affects. Guastella et al. (2008) completed a similar study, measuring a greater variety of variables relating to cognitive biases and impairment in life and found similar results, such that individuals receiving DCS prior to exposure had significantly better outcome measures than individuals receiving exposure plus placebo. Additionally, the effects of DCS-augmented exposures appear to occur by enhancing between session learning via consolidation

1.6a1. Mechanism of Change

Given therapeutic exposure's long history in treating anxiety disorders, surprisingly little is known regarding mechanisms underlying its robust effectiveness. Exposure was originally conceptualized as a means by which habituation to anxious responding could be achieved. This was accomplished by having an individual encounter anxiety-provoking stimuli without using avoidance strategies (e.g. avoidance of the event itself or the use of safety behaviors as defined above). This exposure occurs repeatedly until the previous anxious response is not elicited by the stimuli—effectively extinguishing previous anxious responding (Barlow, 1988). Similarly, Foa, Huppert, and Cahill's emotional processing theory (EPT; 2006) also appears to hypothesize symptom reduction in a similar manner. EPT highlights the necessity to fully activate fear structures, made up of interpretations of feared stimuli and physiological and behavioral reactions to the stimuli, in order for new information to be integrated. Once this occurs, typically by exposing individuals to their feared stimuli, the goal of therapy is to redesign

the fear structure by allowing new, contrary information to be incorporated in order to reduce both physiological reactivity and behavioral avoidance. Smits, Rosenfield, McDonald, and Telch (2006) completed one of the only process-oriented studies of exposure therapy for social anxiety to date. Individuals with a diagnosis of social anxiety disorder complete brief exposure treatment, in which individuals gave a speech repeatedly across three sessions. They found reduction in probability biases preceded reduction in cost biases, and that both accounted for a significant proportion of reduction in fear. These reductions rebounded slightly between sessions, but decreased quite regularly across the treatment. This is inconsistent with earlier work by Foa et al., (1996), which found reductions in cost biases, and not probability biases, were more predictive of symptom reduction post-treatment.

The argument that both old and new information remains stored in the memory also helps to explains symptom relapse in novel situations, as stimuli in these contexts might activate older pathological fear structures. This is also supported by previously discussed behavioral research indicating extinguished and conditioned learning are retrieved depending on context (Bouton & King 1986). Additionally, data illustrating the augmenting effects of D-cycloserine lends weight to the argument that exposure functions via learning models. Considering that alternative response conditioning may explain extinction, it would seem that therapeutic exposure functions by pairing the previously feared stimuli with a complex state of rising, plateauing, and then decreasing anxiety (e.g. clients learn the anxiety habituates over time). Additionally, Heimberg and Barlow (1988) hypothesized that the moderate arousal pattern achieved during anxiety-provoking exposures is necessary for proper social functioning, while low arousal in a

relaxed state may actually hinder performance, lending to studies indicating individuals using applied relaxation show somewhat smaller effects than cognitive restructuring with exposure (Fedoroff & Taylor, 2001). Additionally, research into arousal's effect on learning indicates a similar pattern, such that moderate arousal enhances memory encoding while heightened (anxious) arousal and minimal (relaxed) arousal reduces the ability of individuals to properly encode new information (Deshpande & Kawane, 1982).

1.6a2. Summary

Exposure treatment for social anxiety disorder is arguably the most common and researched treatment modality. With established efficacy data (see Powers, Sigmarsson, & Emmelkamp, 2008), current efforts are focused on increasing the efficacy of exposure treatments, whether with additional psychotherapeutic techniques or memory enhancing medication. While many of these attempts have shown encouraging results, exposure plus cognitive restructuring remains the gold-standard treatment of social anxiety. The proposed mechanisms underlying these treatments, while originally thought to be habituation, is now thought to be the effect of extinction of anxious responding via the introduction of alternative non-anxious responding. It appears this non-anxious responding occurs as a result of individuals first engaging in feared situations without feared consequences occurring, which then adjusts interpretational biases, leading to fear reduction. Over time and with continued exposure, these steps create a cycle, such that fear reduction then further modulates interpretational biases and later fear reduction.

1.6b. Cognitive Therapy

In contrast with the above more behaviorally-based theories, recent interventions are built upon Clark and Wells' (1995) more purely cognitive model. This model

hypothesizes that individuals with social anxiety view social situations as threatening due to an interaction of past experience and behavioral predispositions. Specifically, they anticipate exhibiting poor performance which will result in excessively costly consequences. Upon entering social situations, this cognitive schema is activated in several key ways. First, socially anxious individuals shift their attention to themselves and physiological sensations of anxiety are interpreted as confirmatory data supporting their view of social situations as threatening. These sensations then trigger negative evaluative thoughts, enhance previous fears that others are negatively evaluating them, and distract the individual from focusing on relevant stimuli in the situation itself. This distraction is also viewed as further evidence for incompetence in social situations. This distracted stance, along with other ways individuals cope with anxiety, can sometimes trigger negative evaluation in others (e.g. Curtis & Miller, 1986). The model posits that some anxious safety behaviors may also enhance physiological sensations. Finally, this model suggests that safety behaviors are an important factor in maintaining social anxiety by preventing disconfirmation of unrealistic cost and probability estimates of feared outcomes, and by actually increasing the likelihood of feared outcomes occurring (e.g. speaking extremely fast to avoid pauses results in others negatively evaluating public speaking performance). Additionally, after a social situation has ended, the presence of ambiguous social feedback leads socially anxious individuals to ruminate on their performance, typically focusing on any signs indicative of negative evaluation, thus leading to enhanced anticipatory anxiety and/or avoidance of the situation in the future.

Clark's cognitive therapy for social anxiety disorder (CT; Clark, 1997; 2001) focuses on the purely cognitive factors that maintain social anxiety. Specifically, clients

are guided to understand which behaviors serve to maintain social anxiety, evaluate their performance while dropping these safety behaviors during behavior experiments, reduce self-monitoring, and shift their attentional focus to the external environment. Cognitive restructuring is also used to address dysfunctional cognitions that occur both during behavior experiments and during anticipatory rumination (Clark, 1997). Although Clark's CT appears to include therapeutic exposure, the focus differs from the typical combined exposure and cognitive restructuring treatment in that behavioral experiments are used to test cognitive restructuring, rather than cognitive restructuring used as a coping strategy during exposures. The treatment also emphasizes some specific video feedback that has some empirical support on its own (Harvey, Clark, Ehlers & Rapee, 2000), though not consistent (e.g. Smits, Powers, Buxkamper, & Telch, 2006).

Clark et al. (2003) compared CT to SSRI fluoxetine plus self-exposure, an approximation of routine practice of physicians in the United Kingdom, and with placebo plus self-exposure. Assessments completed at pretreatment, midtreatment, posttreatment, after three booster sessions, and at twelve months post treatments included an independent ADIS-IV (Brown, DiNardo, & Barlow, 2004) assessment and six self-report measures. At midtreatment, CT was more effective than both the medication plus self-exposure group and the placebo plus self-exposure group, which were not significantly different from each other. At posttreatment, this pattern was seen again. At the end of the booster sessions, CT was still superior to the medication group on four of the seven measures, with no loss of treatment effects, while the medication group improved on three measures. At twelve month follow-up, CT was again superior to the medication group on four measures, but neither group showed any further treatment gains or loss of

established gains. Clark, Ehlers, Hackmann, McManus, Fennell, et al., (2006) compared the same CT to an exposure plus applied relaxation condition and to a wait-list control group. At posttreatment, both active treatments were superior to the waitlist control on all measures and behavior tests, and showed significant treatment gains when compared to pretreatment assessments. Additionally, CT was found to be superior to exposure plus applied relaxation. At three month follow-up, CT was superior to the exposure condition on all measures of social anxiety, while at one year follow-up this was only seen in five of the seven measures. However, during this follow-up period, 44% of the exposure group sought out additional treatment, compared with 6% of the CT group. CT has also been compared to a three week intensive group format and a treatment as usual condition (Mörtberg, Clark, Sundin, & Wistedt, 2007). Here, all treatments produced significant reductions in symptoms of social anxiety, and the original cognitive therapy format outperformed the intensive three week format and treatment as usual condition, which consisted of some type of antidepressant or benzodiazepine. A version of CT adapted for use in an integrated group, individual, and residential treatment program has also been compared to a residential interpersonal therapy program (Borge, Hoffart, Sexton, Clark, Markowitz, & McManus 2008). No significant differences between conditions were found. Across both conditions, 48% of clients no longer met criteria for social anxiety disorder and 70% of clients were classified as improved by follow-ups. While the effect sizes of both conditions were roughly equivalent to effect sizes of other studies, effect sizes were again lower than traditional individual CT (Clark et al., 2003; Stangier, Heidenreich, Peitz, Lauterbach, & Clark, 2003). Possible reasons for this include the rather debilitated nature of the sample, the high proportion of previous treatment non-

responders, and possibly a reluctance of individuals to disclose highly sensitive self-perceptions in a group setting. Overall, Clark's original individual CT is promising with large effect sizes. Once additional sites demonstrate portability in these sophisticated procedures, this version of cognitive therapy may become a viable alternative to traditional cognitive therapy and exposure packages.

1.6b1. Mechanism of Change

The more purely cognitive theories of anxiety disorders treatment emphasize cognitive mechanisms for therapeutic effects. In social anxiety, probability biases and cost biases are most often seen as the core cognitive components to be targeted during treatment. Probability biases, the tendency for individuals to exaggerate the likelihood of negative outcomes, are considered a primary concern in anxiety disorders associated with extremely negative outcomes. In contrast, cost biases, the tendency to exaggerate the consequences of the negative outcome, are considered more central to anxiety disorders associated with less extreme negative outcomes (Foa, Huppert, & Cahill, 2006). As such, cost biases are thought to be more central within social anxiety, since many clients report being overly concerned regarding catastrophic expectancies should a negative outcome occur (Foa et al., 2006). Similarly, Foa et al. (1996) found that changes in cost biases, but not probability biases, showed greater association to social anxiety reduction following Comprehensive Cognitive Behavioral Therapy (CCBT; Foa, Franklin, Herbert & Bellack, 1995). However Smits, Rosenfield, McDonald, and Telch (2006), in a study of mediators of change within exposure sessions, found evidence suggesting that reductions in probability biases resulted in reduction of fear within exposures, which resulted in further reductions in probability biases. Cost bias reductions, however, do not share this causal

role; instead appearing to be a result of fear reductions. While this seems contrary to emotional processing theory which hypothesizes that cost biases are more important in social anxiety, the temporal relationship is logical given that, while it can be relatively easy to correct distorted fears about the frequency of a person's mind goes blank during a conversation, it is inherently more difficult to restructure how this feared outcome would affect the individual on an emotional level. This is expected since the emotional component is typically not activated during discussions in therapy to the degree to which an *in vivo* exposure would achieve, thus the portion of a fear structure containing the cost bias may be less amenable to change during cognitive restructuring. These results, when considered with more recent attention training data, suggest that adjustments in cognitive structures may play a causal role in reducing symptoms of social anxiety. However, simply adjusting these cognitive biases to more healthy levels does not seem adequate to effect significant clinical reductions in social anxiety. Schmidt et al. (2009) reported that while individuals improved in the attention training condition at posttreatment in self-report measures and diagnostic status, certain clinician-administered measures did not improve until a four-month follow. Thus, it appears that while cognitive/attentional changes may be necessary to effect change, experience in anxiety-provoking situations may be necessary for adjusted cognitive biases to become established and generalized.

1.6b2. Summary

Cognitive therapies for social anxiety disorders are more recent developments based around the causal role that interpretational and attentional biases are thought to play in the development and maintenance of the disorder. While CT has demonstrated impressive effect sizes (Clark et al., 2003), the transportability of this treatment has not

been demonstrated as of yet. Attentional modification paradigms, initially conceptualized as additive techniques, unexpectedly produced results equivalent to low-performing CBT (Schmidt et al., 2009).

1.7. Inconsistencies within Mechanisms of Change Research

The dominant psychosocial modalities propose that treatment functions by disrupting maintenance factors specific to the theoretical framework. In examining data, however, therapeutic change appears to occur after a combination of cognitive changes and experiences in environments that disconfirm previous fears. For example, Hoffart et al. (2009) interpersonal therapy vs. residential cognitive therapy process analysis and Smits et al. (2006) study of mediators of change within exposure found evidence that cognitive changes occurred before symptom reduction, and that symptom reduction then furthered cognitive changes. Data from more recent attention training studies also report cognitive changes occurring long before clinically significant symptom reduction (Schmidt et al., 2009). When considering these data, especially in the light of clinical experiences, it becomes clear that self-report of social anxiety symptoms do not change immediately following adjustments in cognitive biases or maladaptive automatic thoughts. Instead, the purpose of disrupting maintenance factors—whether they be automatic thoughts, attentional/interpretational biases, unhelpful interpersonal behaviors, or safety behaviors—may be to give an individual additional cognitive resources, motivation, and/or self-efficacy to begin entering feared situations without automatically resorting to unhelpful behaviors and cognitions characteristic of social anxiety. Thus, while each particular approach has varying degrees of efficacy in reducing symptoms, this may be a result of the relative efficacy of each in getting individuals to fully engage

in social situations and receive contradictory information regarding the lack of threat the situation presents, and thus form new associations between previously feared stimuli and nonanxious responding.

1.8. Response Competition Within Emotional Processing Theory

Within an emotional processing theory (EPT) framework, adequate engagement in exposures, as evidenced by moderate arousal and anxiety levels, is thought to be necessary to activate fear structures and integrate competitive non-anxious experiences. Conceptually, within EPT, social anxiety treatment may function via response competition. Within a response competition viewpoint, engagement in exposure would create complementary memory structures comprised of adaptive behaviors with reduced emotionality components, effectively competing with previously created memory structures. As the new memory structures would lack excessive physiological responding, subjective anxiety levels would similarly be reduced. For example, EPT proposes fear structures can be thought of as nodes in a network, comprised of memories, cognitions, behaviors, and emotions. When situations activate a fear structure, nodes with strong associations are similarly activated. During successful exposure, contradictory information is presented to and incorporated into an activated fear network., These new associations compete directly with previously established anxious responding as helpful behaviors and non-anxious responding is incorporated. This is supported with basic learning research, which indicates both extinguished behaviors (Quirk, 2002) and the extinction itself (Bouton, Rosengard, Achenbach, Peck, & Brooks , 1993) can spontaneously reoccur.

If response competition is a potential mechanism underlying the spectrum of social anxiety treatments, increasing the likelihood that clients will successfully integrate non-anxious experiences would be crucial in improving treatment response rates. First however, the role of engagement in exposures and behavior experiments in reducing symptoms needs to be established. Additionally, if engagement is the sufficient construct in creating response competition in order to reduce social anxiety symptoms, measurements of engagement may also prove to be important in predicting failure across social anxiety treatments, as there are typically individuals who do not respond adequately to established treatments, or drop out of treatment prematurely (e.g. Davidson et al., 2004; Heimberg et al., 1998; Turner et al., 1996).

Additionally, from a basic science perspective, identifying the temporal order in which a variety of proposed maintenance factors change during treatment will shed more definitive light on the effect various techniques have on the process (e.g. post-event processing of exposure on cognitive constructs). While past researchers have contributed a great deal in this area (e.g. Hoffart et al., 2009; Smits et al., 2006), further investigation into the effects engagement and various important constructs have on each other is warranted. Possible candidates of study include cost and probability biases, reduction in safety behaviors, self-efficacy, and the presence of unhelpful automatic thoughts

CHAPTER 2: PURPOSE OF DISSERTATION STUDY

There are currently several efficacious treatments for social anxiety disorder with varying treatment effect sizes. Cognitive behavioral therapy (CBT) for social anxiety focuses primarily on the use of exposure to disrupt strong associations between social situations and fear responses (Heimberg & Becker, 2002) Cognitive therapy, in contrast,

focuses on correcting maladaptive cognitive biases to effect anxiety reduction (Clark, 1997). Each of these treatments is thought to reduce symptoms of social anxiety by disrupting basic maintenance mechanisms of social anxiety disorder, yet mechanism of change research has not supported this view. As such, there exists the possibility that, while each attempts to modulate varying constructs within specific models, overall treatment effects are achieved once a common learning mechanisms is activated. One possible learning mechanisms, response competition, is based on the theory that extinction of a conditioned response (e.g. anxiety) results from a new association of an alternative response, rather than degradation of the original association (Bouton & King, 1986). Factors that facilitate the strengthening of associations between feared stimuli and non-anxious responding may underlie current successful treatment effects. As such, identifying these factors is crucial to continued refinement in treatment protocols, as future iterations of established treatments may begin to incorporate procedures most effective at enhancing learning rather than those fitting the particular conceptual model. Engagement in procedures designed to create these new associations is one construct that is present across multiple treatments for social anxiety. Conceptually, engagement is critical for its role in allowing for full activation of fear structures (e.g. Foa, Huppert, & Cahill, 2006), reduction of avoidance behaviors, and improved ability to test cognitive hypotheses by dropping safety behaviors (e.g. looking at audience improves chance of noticing favorable responses). Additionally, engagement is likely amenable to change using standard psychotherapeutic techniques (e.g. cognitive restructuring or motivational interviewing). Limited engagement, in theory, may be an important predictor of poor response to therapy seen across psychosocial treatments for social anxiety. Additionally,

establishing additional evidence for similar patterns of change across treatments contingent on engagement levels will add support to the hypothesis of a common learning mechanism.

CHAPTER 3: HYPOTHESES

Consistent with a response competition/learning-based model of social anxiety treatment, it was hypothesized that methods serving to enhance mechanisms of learning new information in social situations, whether by increasing engagement in feared tasks or by emphasizing accurate perceptions and interpretations of performance, would effect greater changes in cognitive measures thought to maintain the disorder. Specific hypotheses are presented below.

3.1 Testing the Relationship Between Engagement and Symptom Reduction

3.1a. Differential Engagement Between Conditions

It was hypothesized that individuals in an intervention that heightens engagement would report higher levels of engagement during a public speaking task than a standard cognitive intervention or a standard exposure intervention.

3.1b. Engagement Across Conditions

It was hypothesized that regardless of intervention orientation, individuals with higher levels of reported engagement would show greater improvement after treatment than individuals with lower levels of reported engagement. That is, individuals reporting being more fully engaged in the public speaking task were expected to benefit more from intervention regardless of the particular approach of the intervention.

3.2. Effect of Engagement on Patterns of Symptom Change

3.2a. Engagement Intervention and Early Symptom Reduction

It was expected that individuals in an intervention that heightens engagement would show improvement on symptom measures sooner than either a standard cognitive intervention or a standard exposure intervention.

3.2b. Interventions Associations with Final Symptom Reduction

It was expected that at the end of intervention, individuals in an intervention heightening engagement would show comparable improvement on symptom measures as individuals in a standard cognitive intervention. Additionally, it was expected that at the intervention, both individuals in an intervention heightening engagement and individuals in a standard cognitive intervention would show greater improvement on symptom measures than individuals in a standard exposure intervention.

3.3. Effect of Engagement on Subjective Anxiety Levels

3.3a. Engagement Levels and Heightened Subjective Anxiety

It was hypothesized that higher levels of engagement, which indicates an absence of safety behaviors designed to reduce short-term anxiety, would be associated with higher levels of subjective anxiety during a public speaking task, when controlling for initial subjective social anxiety.

3.3b. Subjective Anxiety and Symptom Reduction

It was hypothesized that this initial heightened anxiety would be expected to be related to improvement at the end of session, though levels of engagement would account for a majority the variance.

3.4. Effect of Condition on Concordance of Observer and Subjective Ratings

It was expected that observer behavior ratings by undergraduate research assistants would be related to participants' subjective ratings of performance and anxiety differentially depending on intervention type.

3.4a. Engagement Intervention Increasing Early Concordance

It was hypothesized that individuals in an intervention heightening engagement would show more similar concordance between observer and subjective performance and anxiety ratings earlier in intervention than individuals in either a standard cognitive intervention or standard exposure intervention.

3.4b. Post-intervention Concordance Between Conditions

It was expected that at the end of intervention, concordance between observer and subjective performance ratings would show no significant differences when comparing individuals in an intervention heightening engagement to individuals in a standard cognitive intervention. Additionally, it was expected that at the end of intervention, both individuals in an intervention heightening engagement and individuals in a standard cognitive intervention would show greater concordance in observer and subjective performance ratings than individuals in a standard exposure intervention.

CHAPTER 4: METHOD

4.1. Participants

Two thousand eighty-six participants were recruited from the University of Nebraska's UNL) undergraduate psychology pool to participate in a mass testing that included the Brief Fear of Negative Evaluation (BFNE) and Personal Report of Confidence as a Speaker (PRCS; described in the Measures section). The UNL undergraduate psychology pool primarily consisted of students in the Introduction to

Psychology and Statistics classes, although other undergraduate psychology classes were represented as well. Criteria for participation include being 19 years of age. A waiver of consent was obtained from the Institutional Review Board so individuals who were 18 years of age could participate without parental consent. Each student participating received experimetrix credit.

Participants completed the BFNE and PRCS in the spring of 2011 (N = 682), summer of 2011 (N = 127), fall of 2011 (N = 797), or spring of 2012 (N = 480). Participants with high levels of social anxiety, defined as at or above 41 on the BFNE, were recruited for participation in the second phase of the study. The cut-off score was determined to by the highest quartile of scores in the spring 2011 mass testing.

A non-clinical sample was used for several reasons. First, social anxiety is conceptualized as existing on a continuum, such that clinically significant levels of social anxiety are differentiated from nonclinical social anxiety on the basis of quantitatively greater degrees of distress and interference, but not necessarily qualitative differences in symptom presentation (Rapee & Heimberg, 1997). As such, processes that modulate social anxiety symptoms are likely to be similar in both clinical and analogue groups. Also, previous studies using similar experimental designs (e.g. Harvey, Clark, Ehlers, & Rapee, 2000) have found significant effects within analogue socially anxious students. Finally, the current study was not expected to cause durable benefits to individuals with high levels of social anxiety, and a concern was that clinical samples may interpret non-improvement post-experiment as evidence for low expectancies for formal therapy. As such, the conceptualization of social anxiety itself, relative ease of recruitment, and

minimal concern regarding participants forming negative impressions toward therapy contributed to the decision to select an analogue social anxiety sample.

Six hundred and six individuals were recruited via telephone and email recruitment. Seventy-seven individuals participated in the second phase of the study. Approximately two-thirds of the study were women (64.9%). The majority of participants (93.5%) identified as "White," 3 participants (3.9%) identified as "Asian/Pacific Islander," and 2 participants (2.6%) identified as "Hispanic/Latino." The average age of participants was 19.06 (*SD* = 1.35). Table 4.1 provides univariate statistics for the mass testing BFNE and PRCS scores of participants in the second phase of the study by gender.

Table 4.1. Descriptive Statistics for Mass Testing BFNE and PRCS Scores by Gender

	BFNE		PRCS		
Gender	M (SD)	Range	M (SD)	Range	N
Men	46.89 (5.20)	41 – 49	12.78 (9.45)	1 - 29	27
Women	47.64 (4.65)	41 - 60	16.82 (7.58)	0 - 28	50
Total	47.38 (4.83)	41 - 60	15.40 (8.45)	0 - 29	77

Note: BFNE = Brief Fear of Negative Evaluation, PRCS = Personal Report of Confidence as a Speaker

4.2. Measures

4.2a. Brief Fear of Negative Evaluation Scale

The Brief Fear of Negative Evaluation Scale (BFNE, Leary, 1983) assesses an individual's sensitivity to criticism by others, a central construct within social anxiety

disorder (Collins, Westra, Dozois, & Stewart; 2005; Wells et al., 1995). The BFNE contains 12 statements relating to fears of others' negative judgments that are rated according to how characteristic they are of the individual. This brief version correlates highly to the original Fear of Negative Evaluation scale (FNE; Watson & Friend, 1969), $r = .96$, $p < .001$ (Leary, 1983). Intervention induced changes on the BFNE have been found to be one of the best predictors of long term symptom reduction (Mattick, Peters, & Clarke, 1989) and is generally thought to be a good measure of social anxiety. The BFNE has been subject to some criticism regarding its factor structure, as the four reverse-coded items tend to load on a separate factor, possibly due to confusion and erroneous responding (Rodebaugh et al., 2004). While some attempts to revise these reverse-coded items have taken place, researchers are reluctant to remove or reword these items due to concerns of reducing sensitivity of the BFNE in detecting social anxiety (e.g. Carleton, McCreary, Norton, & Asmundson, 2006). The BFNE, due in part to its brevity, was chosen as a screener questionnaire for recruitment purposes. Internal consistency was moderate in the current study (coefficient $\alpha = .69$).

4.2b. Personal Report of Confidence as a Speaker

The Personal Report of Confidence as a Speaker (PRCS; Paul, 1966). The PRCS is a commonly used measure of public speaking anxiety. The original PRCS (Gilkinson, 1942) consisted of 104 items; this modified version is the most widely used revision and consists of 30 items pertaining to thoughts, feelings, and perceptions before, during, and after a speech. Respondents indicate whether each item is "true" or "false" and higher scores reflect greater anxiety. Normative data suggests there are no differences with regard to gender, race, age, or grade point average (Phillips, Jones, Rieger, & Snell,

1997). Lombardo (1988) described adequate validity in using the PRCS to measure public speaking anxiety. Additionally, this version has been found to have excellent internal reliability with no gender differences (α = .91; Klorman, Weerts, Hastings, Melamed, & Lang, 1974) and within previous studies at UNL. Internal consistency was high in the current study (coefficient α = .94).

4.2c. Social Interaction Anxiety Scale and Social Phobia Scale

The Social Interaction Anxiety Scale (SIAS) and the Social Phobia Scale (SPS) were developed by Mattick and Clarke (1998) to assess the extent and specific types of fears associated with social anxiety disorder. High scores on the SIAS are associated with a greater number of feared social situations while high scores on the SPS are associated with a greater number of feared performance situations (Brown et al., 1997). Scores on these scales are stable in untreated samples and sensitive to clinical change during treatment. Furthermore, unlike the BFNE, these scales have been found to have low correlations with depression, state and trait anxiety, and social desirability (Mattick & Clarke, 1998). These scales were chosen to describe the sample's baseline social anxiety levels due to their relative ease in assessing both performance and interaction anxiety, which may vary more independently in an analogue sample than typically seen in individuals meeting full DSM-IV criteria for social anxiety disorder. Internal consistency was acceptable in the current study for both the SIAS (coefficient α = .80) and SPS (coefficient α = .88).

4.2d. Appraisal of Social Concerns Scale

The Appraisal of Social Concerns Scale (ASC; Telch, Lucas, Smits, Powers, Heimberg, & Hard, 2004) is a self-report measure modified by Smits et al. (2006) to

include only items regarding visibility of anxiety symptoms, negative reactions from audience members, and impaired performance during a public speaking task. Participants were asked to rate both the probability of a negative event occurring and the cost of said event on a 0 to 100 scale. This version of the ASC has been shown to have adequate internal reliability in similar process-oriented studies in the past, with probability bias α =.82 and cost bias α = .91 (Smits et al., 2006). The ASC was chosen in order to assess for cognitive biases seen in social anxiety disorder that have been implicated as important maintenance factors of the disorder (Foa, Huppert, & Cahill, 2006). Internal consistency was high in the current study for probability (coefficient α = .80) and cost (coefficient α = .88).

4.2e. Confidence with Public Speaking

Confidence with Public Speaking (Confidence). Before completing the public speaking task, just after the task, and after specific procedures unique to condition, participants rated their overall confidence with public speaking on a 0 (completely confident) to 100 (extremely unconfident). This rating was used to assess subjective confidence ratings regarding public speaking, and was used as a comparison unit after exposure during post-event processing in the engagement group and video feedback in the cognitive group. Expected fear was not asked as this may introduce potential intervention effects in the exposure only group, as reduced fear post-exposure may lead to individual spontaneously disconfirm fears, a central theme of cognitive restructuring.

4.2f. Rapee Perception of Speech Performance

The Rapee Perception of Speech Performance (RPSP, Rapee & Lim, 1992) is a 17-item self-report measure which asks participants to rate their speech performance on 5

global and 12 specific items regarding the quality of a just completed speech. The RPSP has been used in similar research designs in the past and has demonstrated good internal validity (α varying between .75 and .92; Rapee & Lim, 1992; Rodebaugh & Chambless, 2002). The RPSP was used to assess for the participants' relative perception of their ability to speak in public before a speech, just after the speech, and after specific procedures unique to condition. As the RPSP is typically used after a speech, the baseline administration of the RPSP included instructions for participants to record how they *expect to* perform during the speech. The 12 items pertaining to specific qualities (e.g. stuttering, blushing, sweating, etc) were used during the cognitive preparation procedure described in the *Cognitive Condition* below. Internal consistency was high in the current study (coefficient α = .88).

4.2g. Subjective Units of Distress Scale

The Subjective Units of Distress Scale (SUDS) is a self-report measure of the subjective anxiety, which asks an individual to verbally rate their anxiety on a scale ranging from 0 (no anxiety) to 100 (severe/extreme) with descriptor ratings at each quartile. The SUDS is a commonly used measure to quickly assess subjective levels of anxiety during exposures and is often cited in treatment (e.g. Davidson et al., 2004; Heimberg et al. 1998; Hope, Heimberg, & Bruch, 1995) and research studies (e.g. Herbert, Bellack, & Hope, 1991). The SUDS was chosen to quickly gauge how anxious individuals became without significantly distracting them from the task at hand.

4.2h. Engagement in Session Scale

The Engagement in Session (EIS) scale, a self-report scale in which individuals rated the degree to which they felt engaged throughout the session and during the public

speaking task on a Likert scale, ranging from completely unengaged to completely engaged. This scale was created as part of a post-session rating form for general Anxiety Disorders Clinic at the University of Nebraska-Lincoln. As evidence from Clark's cognitive therapy (1997) indicates increasing full devotion of attentional resources to social situations and away from distractions/safety behaviors is crucial to symptom remission, the EIS is expected to be a good predictor of reduction in symptoms of social anxiety. As this is the first use of the EIS in a research study, it does not currently have published reliability or validity information.

4.3 Procedure.

Participants were recruited based on their scores on the BFNE administered during a mass testing session. Specifically, the BFNE scores of all mass testing participants were calculated and participants falling in the upper quartile, at or above a 41, were invited to participate via a telephone call and follow-up email.

4.3a. Informed Consent

Participants were provided an informed consent form to read prior to completing the second phase of this study. The researcher or research assistant reviewed confidentiality, a general outline of procedures including mention of giving a speech to a small audience in front of a video camera, and the option to withdraw at any time without penalty. If participants still wished to participant they signed the consent form. No participants withdrew at this point of data collection.

4.3b. Data Collection Procedures

Participants were scheduled one at a time in one-hour blocks. Randomization of condition was achieved by using a random number generator to determine order of

condition across the study. Following the informed consent procedures, participants completed the Social Interaction Anxiety Scale (SIAS), Social Phobia Scale (SPS), the modified Appraisal of Social Concerns Scale (ASC), and the Rapee Perception of Speech Performance (RPSP) regarding how they expected to perform in the upcoming speech. The SIAS and SPS were only used to describe the sample as it compares to clinical populations with diagnoses of social anxiety disorder. The ASC, RPSP, and PRCS (administered at prescreening) were used multiple times during intervention, as described below (See Appendix A).

4.3b1. Engagement Condition

Participants in the engagement group received instructions designed to mimic a typical pre-exposure preparation in Heimberg's CBT protocol for social anxiety, including briefly describing the purpose of exposure in treating social anxiety, setting achievable goals for the exposure, identifying feared consequences, and creating rational responses to help cope with these fears (See Appendix B). This group also received instructions designed to increase engagement in the speaking task as follows:

> *While you are speaking, try to fully participate in the experience and make an effort to look out at the audience and, even if you feel anxious, try to continue. Try to avoid focusing on whether or not you feel anxious—rather, try to focus your attention at what you are speaking about and* ***<u>not</u>*** *how well you are doing.*

After a three minute preparation period, they were asked to rate their overall confidence in giving a speech to an audience on a 0 (completely confident) to 100 (extremely unconfident) regarding giving the speech. These participants then gave a three minute speech to an audience in front of a video camera and two research assistants, both male,

blind to condition and with the video camera between and behind them. Following the speech, participants were asked to rate their confidence level again, gave Subjective Units of Distress (SUDS) ratings on a 0 (no fear) to 100 (extreme/severe fear), and completed the Engagement in Session Scale (EIS), RPSP, modified ASC, and PRCS. They then received post-event processing of the exposure in a manner consistent with Heimberg's CBT protocol, including emphasizing achievement of behavioral goals and correction of any thinking errors.

Participants then rated for a third time their confidence with public speaking, and complete the modified ASC, RPSP, and the PRCS.

4.3b2. Cognitive Condition

Participants in the cognitive group were asked to rate their overall confidence rating, prepared for the speech for three minutes, gave a three minute speech, rated peak confidence and fear afterwards, and completed the EIS, RPSP, modified ASC, and PRCS in a manner similar to the engagement group, except without receiving any exposure preparation or post-event processing. Instead, this group received cognitive preparation instructions, as outlined by Harvey et al. (2000; See Appendix C). Cognitive preparation involved having participants 1) predict which of the 12 behaviors rated on the RPSP they thought they would see in the video and what observable behaviors would indicate each, 2) to close their eyes and form a clear image of how they thought they came across during the speech and to rate how vividly they were able to see themselves giving the speech on a scale of 0 (not vivid at all) to 10 (extremely vivid), and just prior to viewing the videotape, 3) were instructed to watch the video as if watching a stranger, such that they should watch it while attending to how they looked rather than how they felt during

the speech. They then watched the video with no feedback from the experimenter and rated for a third time their confidence with public speaking, and completed the modified ASC, RPSP, and the PRCS.

4.3b3. Control Exposure-Only Condition

Participants in the control group did not receive any exposure preparation, post-event processing, cognitive preparation, or videotape feedback. Instead, they were asked to rate their overall confidence level, prepared for the speech for three minutes, gave a three minute speech, rate confidence and peak fear afterwards, and completed the EIS, RPSP, modified ASC, and PRCS in a manner similar to the engagement and control groups. To adjust for time spent during elements in the other two groups, individuals in the control group will then complete a seven minute filler task comprised of copying geometric shapes. Following this seven minute delay, they again rated their confidence level and completed the RPSP, modified ASC, and PRCS. Special care was taken to avoid restructuring any thoughts the participant spontaneously reported, reassuring them, or in any way facilitating the exposure using methods from previous conditions.

4.3c. Post-experiment Observer Behavior Ratings

At the completion of the data collection phase, participants' videotaped speeches were rated by five undergraduate research assistants using a 0 to 100 scale for peak anxiety, performance, and degree to which they appeared engaged in the speech. The raters were unaware of the particular hypotheses of the study, participant self-ratings of anxiety, performance, and engagement, or the group assignment. Similar to past research (e.g. Norton & Hope, 2001a), the objective was for the research assistants to rate how the participants might be viewed if they had given the speech in real life. As such, training

regarding signs of anxiety or other behaviors to observe was not explicitly given. Instead, to give the raters a sense of the range of performances they could expect, they viewed several videos of both anxious and relaxed participants. The raters were also informed to not discuss the ratings they give on various speeches. Each research assistant viewed each video in a random order independent of other raters. Inter-rater reliability of anxiety, performance, and engagement ratings were analyzed using two-way mixed effects intraclass correlation coefficients. Strong interrater reliability was seen for anxiety (.71), performance (.80), and engagement ratings (.85).

CHAPTER 5: RESULTS

5.1. Preliminary Data Procedures

Reliability coefficients were calculated for all scales used. All scales had reliability coefficients greater than or equal to $\alpha = .80$. One-way ANOVAS comparing BFNE, PRCS, SIAS, and SPS scores between the conditions were conducted to examine the effectiveness of random assignment. Table 5.1 contains the group means and standard deviations for the BFNE, PRCS, SIAS, and SPS by condition. Results indicated no significant differences between conditions on the BFNE [$F(2,76) = 0.50$, $p = 0.61$] and SPS [$F(2,76) = 1.01$, $p = .37$] at baseline. Unexpectedly, there were significant differences on initial PRCS scores between groups [$F(2,76) = 5.43$, $p < 0.01$). Post hoc comparisons using Tukey HSD test indicated that the mean score for the Engagement condition ($M = 19.00$, $SD = 7.24$) was significantly different from the Cognitive condition ($M = 11.89$, $SD = 8.92$) and the Control condition ($M = 15.16$, $SD = 7.37$). However, the Cognitive condition did not significantly differ from the Control condition. There were also significant differences on SIAS scores between groups [$F(2,76) = 3.17$, p

= .048) (see Figure 5.1). Post hoc comparisons using Tukey HSD test did not reveal any significant simple effects, likely due to insufficient power (p = .07 and .09 for differences Engagement-Cognitive and Engagement-Control, respectively). Due to significant differences on initial PRCS scores, all between condition analyses below will include initial PRCS as a covariate when appropriate.

5.2. Condition Manipulation Check

In order to test whether the instructions encouraging engagement in the task increased self-reported engagement-levels, a one-way ANCOVA comparing EIS scores between the conditions controlling for initial PRCS scores was conducted. Results indicated no significant difference between conditions on the EIS [F(2,73) = .457, p = 0.64] (see Figure 5.2 for comparisons of residual EIS scores after controlling for initial PRCS score).

To further investigate this, a one-way ANCOVA was conducted comparing observer-reported engagement levels between conditions while controlling for initial PRCS. Results indicated no significant difference between conditions on observer-reported engagement [F(2,61) = .391, p = 0.68] (see Figure 5.3 for comparisons of residual EIS scores after controlling for initial PRCS score).

5.3. Hypothesis-Specific Analyses

Presented below are the analyses relevant to the specific hypotheses of the study. Table 5.2 contains the group means and standard deviations for the PRCS, RPSP, and ASC subscales

across condition for each time point. Table 5.3 contains the correlations between self-reported engagement levels and initial scores on the BFNE, PRCS, SIAS, and SPS.

Table 5.1. Descriptive Statistics for the BFNE, PRCS, SIAS, and SPS by Condition.

		BFNE		PRCS		SIAS		SPS	
Condition	N	M (SD)	Range	M (SD)	Range	M (SD)	Range	M (SD)	Range
Engagement	26	46.54 (4.66)	41 – 60	19.00 (7.24)	5 – 29	32.77 (8.62)	17 – 50	20.74 (9.56)	4 - 39
Cognitive	27	47.63 (5.49)	41 – 59	12.15 (9.12)	1 – 28	26.81 (11.81)	4 – 49	16.93 (11.32)	1 – 41
Control	24	48.00 (4.25)	41 – 57	15.16 (7.53)	0 – 27	25.58 (12.91)	9 – 58	18.13 (10.72)	0 - 47

Note: BFNE = Brief Fear of Negative Evaluation, PRCS = Personal Report of Confidence as a Speaker, SIAS = Social Interaction Anxiety Scale, SPS = Social Phobia Scale

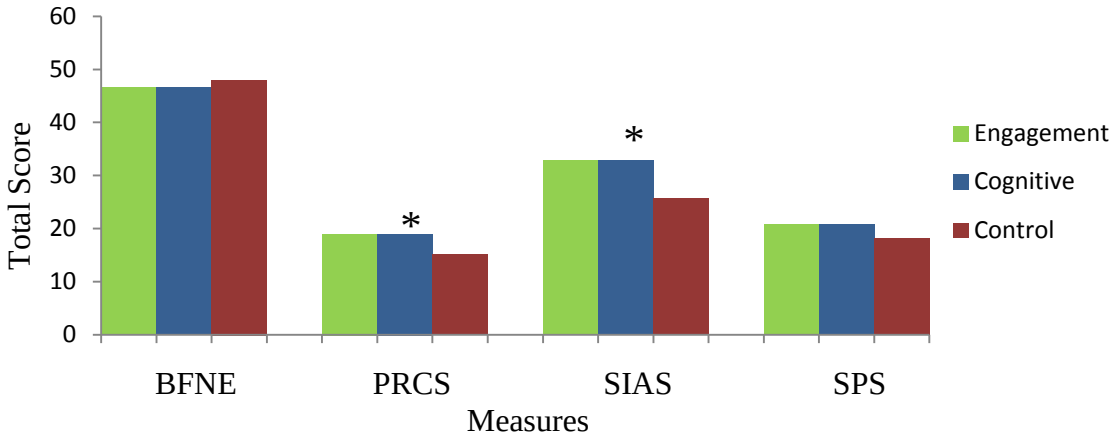

Figure 5.1: BFNE, PRCS, SIAS, and SPS scores at baseline by condition
Note: BFNE = Brief Fear of Negative Evaluation, PRCS = Personal Report of Confidence as a Speaker, SIAS = Social Interaction Anxiety Scale, SPS = Social Phobia Scale

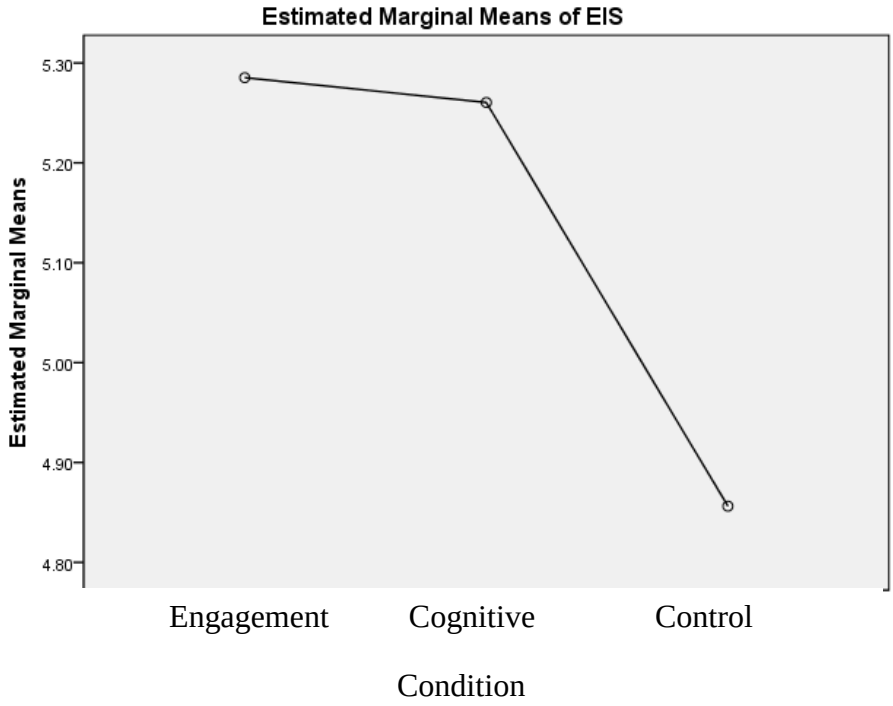

Figure 5.2: Residual EIS Scores after Controlling for Initial PRCS Scores.

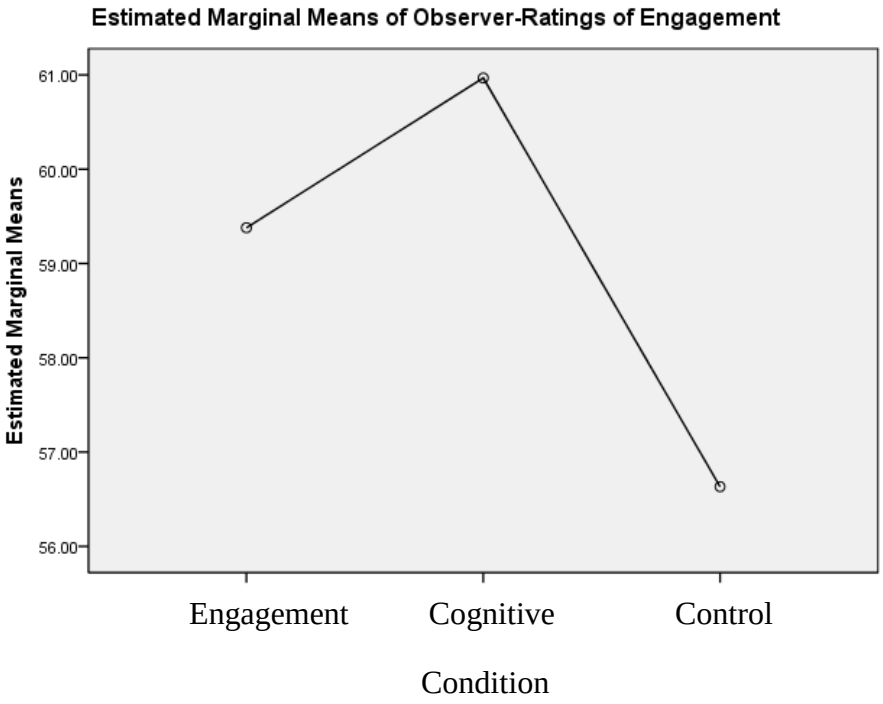

Figure 5.3: Residual Observer-reported Engagement Scores after Controlling for Initial PRCS Scores

Table. 5.2. Descriptive Statistics for the PRCS, RPSP, and ASC subscales by Condition and Time.

		PRCS	RPSP	ASC Cost	ASC Probability
Condition		M (SD)	M (SD)	M (SD)	M (SD)
Engagement	Time 1	19.00 (7.24)	29.92 (9.41)	44.83 (19.04)	35.40 (11.45)
	Time 2	18.50 (6.23)	29.77 (9.18)	41.21 (18.52)	36.65 (13.39)
	Time 3	16.76 (7.28)	26.81 (10.56)	41.19 (20.42)	30.38 (14.14)
Cognitive	Time 1	11.89 (8.92)	23.61 (9.43)	35.14 (19.82)	24.99 (11.73)
	Time 2	13.46 (8.50)	24.71 (11.36)	34.80 (21.83)	24.71 (13.26)
	Time 3	13.14 (8.44)	21.29 (10.62)	32.46 (21.31)	21.88 (13.60)
Control	Time 1	15.16 (7.37)	27.64 (9.11)	44.25 (17.62)	35.04 (15.10)
	Time 2	16.00 (7.67)	31.64 (12.66)	46.05 (19.55)	38.54 (18.69)
	Time 3	15.80 (7.90)	28.32 (12.93)	42.72 (19.50)	34.62 (18.89)

Note: PRCS = Personal Report of Confidence as a Speaker, RPSP = Rapee Perception of Speech Performance, ASC = Appraisal of Social Concerns. Time 1 = Baseline, Time 2 = Post-public Speaking Task, Time 3 = Post-Intervention

Table 5.3. Correlations Between EIS, Observer-rated Engagement, and Initial Scores on the BFNE, PRCS, SIAS, and SPS

Measure	EIS	Observer Engagement	BFNE	Initial PRCS	SIAS
Observer Engagement	.45***				
BFNE	0.19	.26*			
Initial PRCS	-0.35**	-.07	.16		
SIAS	-0.38***	.06	.00	.44***	
SPS	-.27*	.04	-.10	.42***	.73***

Note: Note: EIS = Engagement in Session Scale, Observer Engagement = Observer Ratings of Engagement, BFNE = Brief Fear of Negative Evaluation, PRCS = Personal Report of Confidence as a Speaker, SIAS = Social Interaction Anxiety Scale, SPS = Social Phobia Scale. * $p < .05$, ** $p < .01$, *** $p < .001$.

The between-group manipulation of engagement-enhancing procedures was not effective when examining self- and observer-rated levels of engagement. As such remaining analyses examining the role of engagement on symptom improvement collapsed across groups to better understand these relationships. Difference scores were calculated between initial and post-intervention for confidence ratings, PRCS, RPSP, and modified ASC subscales, such that negative scores reflect improvement on measures (e.g. improved confidence, reduced symptoms on PRCS, RPSP, and ASC). Table 5.4 contains the correlations between self-reported engagement levels and the difference in symptom measures between pre- and post-intervention, including confidence ratings, PRCS, RPSP, and modified ASC subscales as dependent variables for all participants. Results were consistent with the hypothesis that individuals exhibiting high levels of engagement in the public speaking task would show greater reduction across symptom

Table 5.4. Correlations Between EIS, and Pre-Post Changes in Confidence, PRCS, RPSP, ASC Cost, and ASC Probability.

Measure	EIS	Confidence Change	PRCS Change	RPSP Change	ASC Cost Change
Confidence Change	.07				
PRCS Change	-.28*	.07			
RPSP Change	-.41***	.31**	.31**		
ASC Cost Change	-.29**	.13	.33**	.42***	
ASC Probability Change	-.38***	.25*	.43***	.62***	.76***

Note: EIS = Engagement in Session. PRCS = Personal Report of Confidence as a Speaker, RPSP = Rapee Perception of Speech Performance, ASC = Appraisal of Social Concerns.
* $p < .05$, ** $p < .01$, *** $p < .001$.

measures, though there was no relationship between engagement and improved confidence regarding future speaking tasks. Additionally, to investigate whether the relationship between engagement and symptom improvement exhibited a linear or complex relationship, a one-way repeated measures MANCOVA was performed using pre- and post-intervention symptom measures, using self-rated engagement as a covariate. Significant interactions between self-rated engagement and symptom reductions were identified as indicators of interaction effects. Significant interactions were not seen when using engagement as a covariate for confidence [Wilks' Lamda =.99, $F(1,75) = .31$ $p = .56$]. However, significant interactions were seen when using engagement as a covariate for RPSP [Wilks' Lamda = .84, $F(1,75) =14.72$, $p <.001$], probability biases [Wilks' Lamda = .85, $F(1,75) = 12.82$, $p = .001$], cost biases [Wilks' Lamda = .91, $F(1,75) = 7.14$, $p = .009$], and PRCS [Wilks' Lamda = $F(1,75) = 6.26$, $p = .015$]. Given this interaction, participants were divided into low vs. high self-reported engagement levels using a median split on the EIS, where values 5 or less were coded as low engagement and 6 or greater were coded as high engagement. Separate ANOVA's were performed comparing pre- and post- intervention symptom measures for the low- and high-engagement groups. There was no significant difference in any symptom measure for the low-engagement group. However, for the high-engagement group, there were significant reductions in cost biases [$F(1,40) = 3.17$, $p =.003$], probability biases [$F(1,40) = 3.98$, $p < .001$], and on the RPSP [$F(1,40) = 3.89$, $p < .001$]. A trend was seen in reductions on the PRCS [$F(1,40) =1.72$, $p = .094$]. Table 5.5 contains the group means and standard deviations for the change in PRCS, RPSP, and ASC subscale for low- and

high-engagement groups. Figures 5.4 depicts the change in PRCS, RPSP, and ASC subscales by condition for participants with low vs. high engagement.

Table. 5.5. Descriptive Statistics for the Change in PRCS, RPSP, and ASC Subscales by Condition.

	Engagement Level			
	Low		High	
Measure	M (SD)	Range	M (SD)	Range
PRCS Change	1.31 (7.57)	-19 – 21	-1.39 (5.18)	-15 – 8
RPSP Change	1.75 (10.78)	-23 – 24	-4.95 (8.15)*	-24 – 12
ASC Cost Change	.85 (11.50)	-28 – 25	-5.72 (11.58)**	-58 – 12
ASC Probability Change	1.31 (10.81)	-25 – 20	-6.39 (10.29)***	-43 – 13

Note: Negative values indicate improvement on measure. Significant ANOVA's: * $p < .05$, ** $p < .01$, *** $p < .001$.

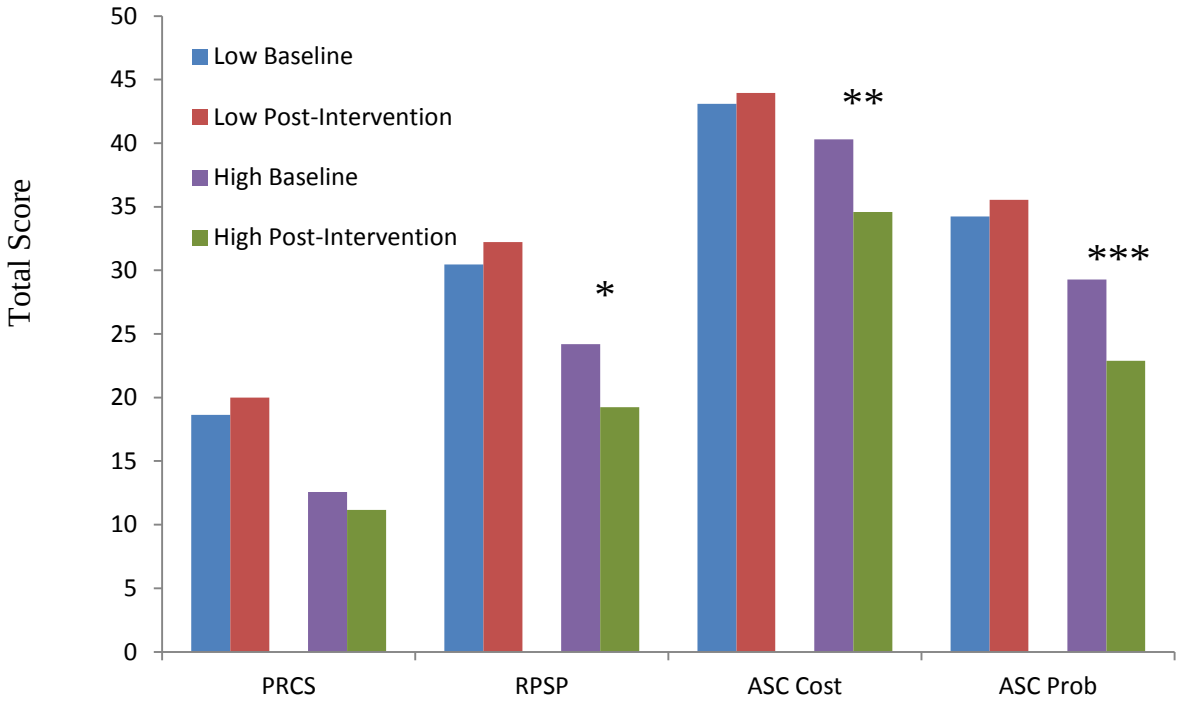

Figure 5.4: Change in PRCS, RPSP, and ASC Subscales by Condition for Participants with Low Engagement vs High Engagement. Note: Significant ANOVA's: * $p < .05$, ** $p < .01$, *** $p < .001$.

While procedures designed to increase engagement were not effective in affecting self- or observer-reported levels of engagement, it was still expected that the differing placement of conceptually distinct instructions between conditions would result in differential patterns of symptom reduction. In order to test whether individuals in an intervention intended to heighten engagement would show improvement on symptom measures sooner than a standard cognitive intervention or a standard exposure intervention, a one-way MANCOVA comparing symptom reduction between initial and post-exposure time points between conditions controlling for initial PRCS scores was conducted. Results indicated no significant difference in symptom reduction between conditions at post-exposure [Wilks' Lamda = ..92, $F(8,142) = .75$, $p = .65$]. In order to test whether individuals in an intervention intended to heighten engagement would show comparable change on symptom measures as a standard cognitive intervention, a one-way MANCOVA comparing symptom reduction between initial and post-intervention time points between conditions controlling for initial PRCS score was conducted. Resulted indicated no significant difference in symptom reduction between any conditions at post-intervention [Wilks' Lamda = .94, $F(8,140) = .52$, $p = .84$].

In order to test whether individuals in an intervention intended to boost engagement, partly by reducing safety behaviors, experienced higher levels of anxiety during the public speaking task, a one-way ANCOVA comparing peak anxiety during the public speaking task between the conditions controlling for initial PRCS scores was

conducted. Results indicated no significant differences on peak anxiety between groups [$F(2,72) = 1.16$, $p = .32$).

Emotional processing theory (Foa, Huppert, & Cahill, 2006) suggests that full activation of fear structures related to anxiety-provoking stimuli is necessary to incorporate competitive feedback and reduce symptomatology. Given this, it was expected that individuals who were able to more fully activate fear structures would show greater symptom improvement. To test this, Steiger's Z-test was computed between peak anxiety and engagement predicting improvement on symptom measures. Peak anxiety was significantly associated with worsening in self-rated performance ($r = .26$, $p = .02$) and worsening probability biases ($r = .29$, $p = .01$), suggesting increasing levels of anxiety led participants to increase their estimation of future anxiety in public speaking tasks, while engagement was associated with improvement in all symptom measures. As such, further analyses comparing the predictive validity of public speaking anxiety and engagement on symptom reduction were not pursued due to divergent directions of their predictive validity. As expected, however, engagement was associated with reductions across all symptom measures (See Table 5.6).

Table 5.6 Relationship Between EIS and Peak Anxiety and Symptom Reduction

Measure	Peak Anxiety	EIS	PRCS	RPSP	ASC Cost	ASC Probability
Peak Anxiety	—	-0.53***	0.038	.26*	.18	.29*
EIS	-.53***	—	-.28*	-.41***	-.30**	-.38***

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

It was expected that individuals in an intervention designed to heighten engagement would show more similar concordance between observer and subjective

performance and anxiety ratings earlier in intervention than individuals in either the standard cognitive intervention or standard exposure intervention. To test this, ratings were first converted to z-scores, and discrepancy scores were created between observer and subjective performance and anxiety scores. A one-way MANCOVA comparing discrepancy scores for anxiety and performance ratings between conditions controlling for initial PRCS score was conducted. Resulted indicated no significant difference in either discrepancy score between conditions [Wilks' Lamda = .95, $F(2,59) = .77$, $p = .55$].

It was expected that at the end of intervention, concordance between observer and subjective performance ratings would show no significant differences when comparing individuals in an intervention heightening engagement to individuals in a standard cognitive intervention, and that individuals in an intervention heightening engagement and individuals in a standard cognitive intervention would show greater concordance in observer and subjective performance ratings than individuals in a standard exposure intervention. To test this, ratings were first converted to z-scores, and discrepancy scores were created between observer and subjective performance scores. A one-way ANCOVA comparing discrepancy scores for performance ratings between conditions controlling for initial PRCS score was conducted. Resulted indicated no significant difference in performance discrepancy score between conditions at the end of intervention [$F(2,61) = 1.78$, $p = .18$].

CHAPTER 6: DISCUSSION

The purpose of the current study was to investigate the role of engagement in the reduction of social anxiety symptoms across conceptually distinct treatment components. Specific research hypotheses were designed to examine the relationship between

engagement and symptom reduction, efficacy of enhancing engagement with verbal instructions, pattern of symptom reduction between the intervention components, and relationship between self- and observer-reported measures of anxiety, engagement, and performance quality.

6.1. The Effect of Engagement on Social Anxiety Symptom Reduction

In line with a response competition-based model of social anxiety treatment, it was hypothesized that factors serving to enhance response competition, such as engagement in the intervention procedures, would result in greater symptom improvement when compared to conditions not emphasizing engagement in the public speaking task. Identifying the role of engagement in symptom reduction across treatments has both theoretical and practical implications. Specifically, under-engagement in treatment procedures, whether consisting of exposure, cognitive restructuring, or behavior experiments, represents an important construct that may underlie treatment failure in spite a clients' apparent adherence to treatment protocols. In line with predictions, self-reported levels of engagement did show medium strength relationships with improvements on self-rated measures of confidence as a speaker, speech performance, cost biases, and probability biases. When examined further, individuals with low levels of self-reported engagement exhibited no improvement, while individuals with high levels of engagement reporting significant improvement on almost all measures.

6.2. Efficacy of Enhancing Engagement

Considering the theoretically important role of engagement on symptom reduction and treatment utilization, a matter of practical importance to improve current treatments

is identifying methods of enhancing engagement within session. In the Engagement condition, in addition to typical pre-exposure cognitive restructuring (e.g. Heimberg & Becker, 2002), instructions were given to encourage participants to fully experience the public speaking task, focusing their attention on the task itself rather than on symptoms of anxiety (e.g. physiological or cognitive). In contrast, the remaining two conditions received no pre-exposure preparation of cognitive restructuring or engagement-specific instructions. Despite this, neither self- nor observer-reported levels of engagement differed across conditions. This suggests that engagement levels were fairly resistant to simple modification. Additionally, considering self-reported engagement only exhibited a moderate relationship with initial social anxiety scores, this variable may represent a more complex construct than originally thought.

6.3. Pattern of Symptom Reduction Between Intervention Components

Several meta-analyses and process studies have suggested that conceptually distinct treatments are equally effective (Rodebaugh, Holaway, & Heimberg, 2004) and exhibit similar patterns of change amongst cognitive, behavioral, and interpersonal constructs (Hoffart, 2009; Smits et al., 2006). Despite the lack of effect in enhancing engagement levels for the engagement condition, each group in this study received markedly distinct intervention instructions in line with the two dominant treatments—exposure plus cognitive restructuring, cognitive preparation plus video feedback, and an exposure-only active control. In line with a response competition conceptualization of treatment of social anxiety, it was thought that these components would increase response competition differentially. Specifically, it was expected that cognitive restructuring within the engagement condition, by encouraging participants to use active rational

responses during the public speaking task, would effect change sooner than the cognitive preparation, where significant change would occur following video feedback. Furthermore, it was expected that both cognitive restructuring and cognitive feedback would increase response competition more so than exposure alone. In contrast to these hypotheses, and consistent with past studies, no differences were seen between conditions at any time points, with all interventions resulting in similar patterns and strengths of symptom reduction. That this was seen across conditions suggests the three treatments worked for similar reasons. However, there are two possibilities that should be considered. First, the primary mechanism of action may be the common procedure used across all intervention procedures—a public speaking task followed by an absence of negative feedback. Habituation, the process of increasing anxiety due to the sympathetic nervous system followed by stabilization and reduction via activation of the parasympathetic nervous system, is unlikely to be a driving factor in symptom reduction in this study due to the brief nature of the speech. Additionally, providing only one opportunity to speak prevented any between-exposure habituation or between-session memory consolidation to occur as seen in typical exposure-focused treatments (e.g. Guastella et al., 2008). As such, only within-exposure change could have occurred, possibly as a result of neutral to positive feedback correcting faulty cognitive biases. In contrast to this, there it is also possible that all conditions inadvertently included a cognitive-modification component that produced symptom reduction. That is, the engagement boosting procedures may have mimicked the effect of video feedback by encouraging outward-focused attention to the audience and task, and away from the participants' inward anxious state. However, the control condition of solely public

speaking did not include any mention of thoughts, attention, or methods to affect cognitive constructs, yet symptom reduction was not significantly different between any condition. As such, while it is true that both the engagement and cognitive interventions include cognitive-modification instructions, this argues against the idea that all treatments produced similar symptom reduction due to cognitive-modification procedures. Instead, the common procedure of a public speaking task without negative feedback remains the most parsimonious explanation for the results.

6.4 Relationship Between Self- and Observer-Reported Measures

Considering the inaccurate probability and cost biases seen in social anxiety disorder show improvement following interventions (Foa et al., 1996), and are an important mechanism of later change (Smits, Rosenfield, McDonald, & Telch, 2006), it was expected that self- and observer-ratings of performance quality and anxiety would show greater concordance in line with the presentation of active components of the intervention (e.g. the intervention with earlier active components would produce improved concordance sooner that interventions with active components presented later). As such the engagement intervention, with cognitive restructuring occurring before the speaking task, was expected to show improved concordance before the cognitive or control conditions. Additionally, it was expected that the cognitive condition would then show improved concordance at the end of the intervention once the video feedback procedures occurred. However, there was no significant difference seen in the similarity of self- and observer ratings for either performance quality or anxiety between conditions at either time point. This again provides additional evidence that that three conditions,

though presenting distinct procedural instructions to participants regarding the speaking task, resulted in similar patterns of effects.

6.5. Limitations

The results of the current study should be interpreted in light of the study's limitations. Potential limitations include the use of a non-clinical sample, the relative homogeneity of the sample demographics, significant differences at baseline on one measure of public speaking confidence, and the possibility that two conditions were more similar than initially conceptualized.

A non-clinical sample originally was not conceptualized as a limitation overall for several reasons. First, since social anxiety is thought to exist on a continuum, clinical presentations of social anxiety represent quantitatively greater degrees of distress and interference, but not necessarily qualitative differences in symptom presentation (Rapee & Heimberg, 1997). In considering this, and processes modulating symptoms in both clinical and analogue groups are not expected to differ in qualitative ways. Additionally, past studies using similar designs have found significant effects within analogue groups that mimic those seen in clinical samples (e.g. Harvey, Clark, Ehlers, & Rapee, 2000). Finally, in light of effective treatments for social anxiety disorder, the current study was not expected to result in substantial long-term benefit for individuals with high levels of social anxiety. It was worrisome that treatment-seeking participants might misinterpret this study as a full, active treatment, reducing their likelihood of future participation in evidence-based psychotherapy. The relative homogeneity of the sample, being predominantly white and college-aged, again is not expected to affect the generalizability

of the results, as similar experimental paradigms and treatment comparisons have not found that demographic variables significantly affect treatment response.

The significant differences on initial PRCS scores at baseline, with the engagement condition having high scores than either the cognitive or the control conditions, was an unexpected result following random assignment. While statistically it was possible to control for this initial difference in all between-group analyses, it did introduce an additional variable that may have influenced cognitive biases in subtle ways. For example, considering all participants reported high scores on the BFNE, the engagement group may have represented a group of individuals fearful of public speaking in a manner beyond that of participants in the other conditions. This may have resulted in varying degrees of symptom improvement. For example, participants in the engagement condition may have exhibited enhanced symptom reduction when compared to cognitive or control conditions due to greater room for symptom reduction. Alternatively, participants in the cognitive or control condition may have been expected to show greater improvement when compared to the engagement condition due to less severe symptomatology requiring less disconfirmatory evidence to correct. It is not currently possible to fully speak to either possibility at this time.

Finally, the engagement and cognitive conditions both contained significant amounts of cognitive instructions, which may have resulted in the similarity of the results between the two conditions. However, as this study was designed to investigate the overarching role of engagement in symptom reduction, and not necessarily to compare habituation to cognitive therapy, this remains an important question for future treatment comparison studies.

6.6. Future Research

This study and results highlight the need for continuing research into mechanisms underlying successful symptom reduction in social anxiety disorder. While this study compared the effects of instructions specific to the dominant treatment modalities, comparisons based on habituation during and between exposure was not possible due to the time constraints of the study. Considering the predictive nature of self-reported engagement on symptom reduction, assessing the change in engagement throughout a multi-week treatment (as typical in most protocols) and its relationship to other cognitive and behavioral variables would be informative to the temporal pattern of changes. In this study, engagement was measured directly following the exposure, making definite causal statements difficult to assert (e.g. high engagement led to increased symptom reduction). Instead, engagement might vary as a result of successful exposures/behavior experiments, or the two could vary in relation to an additional variable. Including this measure in future process studies would be informative in this way.

Additionally, this study found self-reported engagement was associated with symptom reduction more than observer ratings of engagement. However, the observer ratings were conducted by undergraduate research assistants while the participants were giving the speech. It is possible that raters may have produced ratings more similar to self-reported ratings if they had based them on participants' report of the experience of the speech (e.g. during post-event debriefing). Additionally, while it is possible that trained clinicians may be better suited to identify engagement in anxious clients, this was not examined and remains an important topic for informing future clinical practice. For example, if it were found that self-report and clinician-rated engagement differed

significantly, it may shed light into treatment non-responders (e.g. therapist views clients as engaging adequately while clients report minimal engagement). Or, if they are highly related, clinicians could use their observer-ratings of engagement to discuss adapting treatment to increase buy-in, whether though motivational interviewing or tailoring exposures to increase the likelihood of success.

6.7. Conclusion

The current dissertation explored similarities between conceptually distinct treatment components for social anxiety disorder. While the attempt to boost engagement levels was not successful, engagement as defined here was found to have an important relationship with symptom reduction. All interventions, despite having distinct procedural elements, were not significantly different from each other in terms of the pattern of change or strength of symptom reduction. This lends additional support to the hypothesis that both highly behavioral and highly cognitive therapies for social anxiety disorder function for similar reasons, despite purported mechanisms of change. Finally, it was expected that as cognitive biases concerning speech performance and anxiety levels decreased in the interventions, self-ratings would come in line with observer-ratings. This was not seen, such that self-ratings did not come into line with third-party observers, despite improvements in cognitive biases.

Future research into the role of engagement in symptom reduction, the validity of clinician-ratings of engagement, and process studies comparing manualized versions of exposure with cognitive restructuring to cognitive therapy is important for a better understanding of the nuanced relationships between a variety of cognitive, behavioral, and affective variable that change throughout successful treatment of social anxiety.

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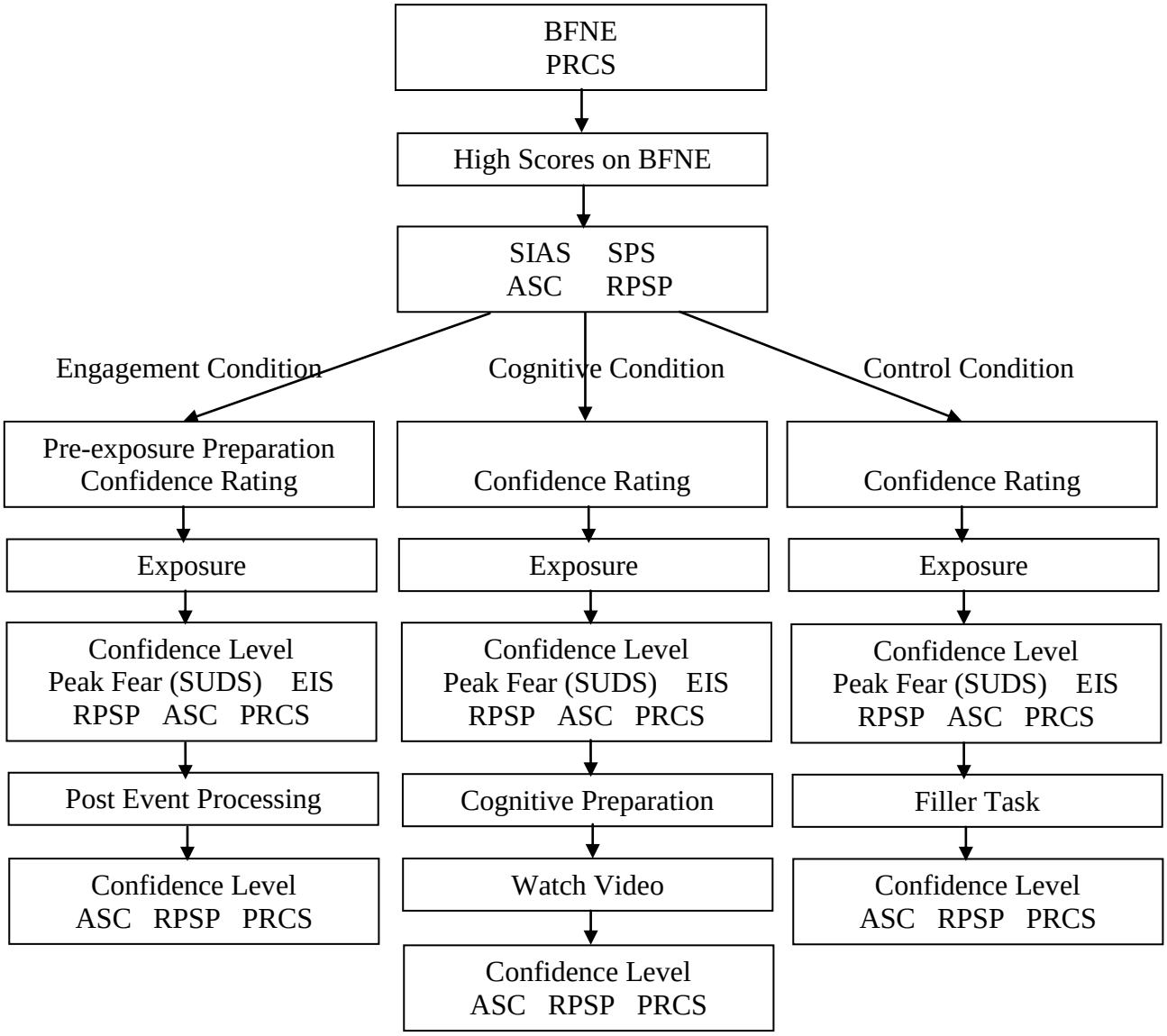
Appendix A

Procedure Flowchart



Appendix B
Engagement Group Pre- and Post-exposure Procedure

Engagement group pre-exposure preparation: Instruct the participant to go through each of the following steps

1) Brief orientation to exposure therapy, along with traditional conceptualizations of the role exposure plays in reducing anxious symptoms.
2) Imagine what it will be like to give a speech to an unfamiliar audience and a video camera. What types of thoughts are you having as you approach the podium, look out at the audience, begin speaking, and continue speaking. Write down at least four to five of these thoughts now. How much do you believe each of these thoughts is true? Rate your belief in each thought on a scale from 0 to 100. Also think about how these thoughts make you feel
3) From the list of thinking errors (provided), identify any thinking errors in the thoughts you reported.
4) Pick one or two thoughts that seem the most troublesome or important and challenge them using disputing questions (provided). You may find it helpful to make some notes about those answers to the disputing questions that best help you to take a more realistic and less anxiety-provoking view of the situation.
5) Summarize your work in Step 3 into one or two rational responses that you will be able to tell yourself silently during the speech. A helpful rational response is generally fairly short, and includes evidence contrary to your fears. Remember that you do not need to fully believe that your rational responses are true—you just need to entertain the possibility and keep an open mind. Write the rational response(s) where you will be able to read it (them) during the speech.
6) Set a behavioral goal that is observable and objective (not based on feelings or difficult to evaluate)
7) While you are speaking, try to fully participate in the experience and make an effort to look out at the audience and, even if you feel anxious, try to continue. Try to avoid focusing on whether or not you feel anxious—rather, try to focus your attention at what you are speaking about and **not** how well you are doing.

Engagement post-event processing:

1) Review your goal—did you achieve it? Avoid disqualifying the positive (that you completed a speech in front of strangers and a video camera on a topic you had barely prepared for)
2) Review previously recorded thoughts—did you have the thoughts you expected? How well did the rational response help combat these thoughts?
3) What can you take away from this experience for future situations involving public speaking?

Avoid the following:

Breathing retraining exercises, advising avoidance behaviors such as only looking at notes/avoiding looking at audience members, focusing attention on other objects in the room, distracting self, or reminding the participant that this is not a real audience.

Appendix C
Cognitive Group Procedure

Instruct the participant to go through each of the following steps:

1) Predict which of the 12 behaviors rated on the RPSP do you think you will see in the video and what observable behaviors would indicate each
2) Close your eyes and form a clear image of how you think you came across during the speech and rate how vividly you are able to see yourself giving the speech on a scale of 0 (not vivid at all) to 10 (extremely vivid)
3) Watch the video as if you are watching a stranger—try to watch it and attend to how you look in the video, rather than remembering how you felt giving the speech

Avoid the following:

Any instructions regarding boosting engagement. Giving any feedback before or after the participants watch the video, any cognitive restructuring before or after the speech, any breathing retraining exercises, advising avoidance behaviors such as only looking at notes/avoiding looking at audience members, focusing attention on other objects in the room, distracting self, or reminding the participant that this is not a real audience.