Psychology Dissertations   Department of Psychology

12-18-2014

Long-term Outcomes of Cognitive Behavioral Therapy for Social Phobia

Shannan M. Edwards
Georgia State University

LONG-TERM OUTCOMES OF COGNITIVE BEHAVIORAL THERAPY FOR SOCIAL PHOBIA

by

SHANNAN EDWARDS

Under the Direction of Page L. Anderson, PhD

ABSTRACT

Social phobia (SP) is a highly prevalent and chronic condition associated with a number of negative outcomes, including significant impairments in social, occupational, and educational functioning (Stein & Kean, 2000). Fortunately, there is substantial evidence to support the efficacy of cognitive behavioral and pharmacological interventions for SP immediately following treatment (McCabe & Antony, 2008). Less is known, however, about the extent to which treatment gains are maintained over the long-term. The current study examined long-term outcomes of two cognitive behavioral treatments for SP, Exposure Group Therapy (EGT) and Virtual Reality Exposure Therapy (VRE). Guided by theories of state dependent and extinction learning, we also sought to explore the extent to which concurrent use of psychotropic medication during treatment attenuated long-term responses to exposure therapy. Eligible participants (N = 75) were individuals had who previously completed either EGT or VRE as a part of two larger treatment studies. Thirty-four participants completed the long-term follow-up assessment which occurred several years (M = 5.7) after the completion of treatment and

consisted of self-report measures, a structured clinical interview, and a behavioral avoidance test. We hypothesized that treatment completers would (1) exhibit fewer SP symptoms at long-term follow-up, relative to pre-treatment and would (2) maintain post-treatment gains over the long-term follow-up period. Lastly, we predicted that (3) concurrent medication use, during treatment, would be associated with diminished treatment gains at long term-follow-up for individuals who had discontinued medication during the follow-up period. Results revealed a significant effect of time on self-report and behavioral ratings of SP with clinically significant improvement observed from pre-treatment to long-term follow-up (p < .05). No significant difference differences were observed from post-treatment to long-term follow-up (p >.05) which suggests that that post-treatment gains were well maintained in the long-term. We were unable to test our hypothesis that psychotropic medication would attenuate long-term treatment gains due to the fact that only one participant had taken medication during treatment that was discontinued during follow-up. In sum, the current study suggests that EGT and VRE post-treatment gains are maintained in the long run up to seven years after the completion of treatment.

INDEX WORDS: Social phobia, Social anxiety, Follow-up, Exposure group therapy, Virtual reality exposure, Behavioral avoidance task, Long-term outcomes

LONG-TERM OUTCOMES OF COGNITIVE BEHAVIORAL THERAPY FOR SOCIAL PHOBIA

by

SHANNAN EDWARDS

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

in the College of Arts and Sciences

Georgia State University

2014

LONG-TERM OUTCOMES OF COGNITIVE BEHAVIORAL THERAPY FOR SOCIAL PHOBIA

by

SHANNAN EDWARDS

Committee Chair: Page Anderson

Committee: Dominic Parrott

Erin Tone

Erin Tully

Electronic Version Approved:

Office of Graduate Studies

College of Arts and Sciences

Georgia State University

December 2014

DEDICATION

I would like to dedicate this dissertation to my wonderful family and friends who provided the unwavering support, love, and encouragement that were essential in helping me to achieve this accomplishment. A special thank you to my Dad, Eddie, Charles, and Granny for all that you have done to help make my dreams a reality. This dissertation is also dedicated in loving memory to my Mom, Nang, LuLu, and Charlotte who I know are celebrating this accomplishment in Heaven. Chipper your unconditional love, affection, and constant companionship gave me the strength and courage to push forward even during the most difficult times. Lastly, I'd like to dedicate this dissertation to my dog Mac who waited patiently by my side night after late night as I worked to complete this project.

ACKNOWLEDGEMENTS

I would like to take this opportunity to express my appreciation to my dissertation chair, Page Anderson, Ph.D., for her guidance with this project. I would also like to thank my committee members, Dominic Parrott, Ph.D., Erin Tone, Ph.D., and Erin Tully, Ph.D. for their thoughtful suggestions and comments. Finally, I would like to thank my fellow graduate students and undergraduate research assistants on the Anxiety Research and Treatment Team who helped to make this project possible. A special thanks to Martha Calamaras, Suzanne Johnson, Natasha Mehta, and Jessica Morgan for your assistance with data collection and entry as well as your unwavering support throughout this project.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1   INTRODUCTION

1.1   Background

Social phobia is characterized by an intense fear of embarrassment and of being negatively evaluated in social and performance situations (American Psychological Association, 2000). Socially phobic individuals commonly exhibit hypersensitivity to criticism or scrutiny from others and tend to have a poor perception of themselves as social beings. Individuals diagnosed with *generalized* social phobia exhibit intense and pervasive fears that generalize across a variety of social settings, such as speaking in public, going to a party, or eating in front of others (APA, 2000). Lifetime prevalence rates for social phobia range from 10-13% in the general population, making it the third most prevalent psychological disorder and the most common anxiety disorder in the United States (Kessler, et al., 2005). Fear of public speaking is the most commonly reported symptom of social phobia in clinical samples (Furmark, Tillfors, Stattin, Ekselius, & Fredrickson, 2000). Indeed, public speaking fears alone have been associated with lower income, decreased likelihood of achieving post-secondary education, and increased likelihood of unemployment (Stein, Walker, & Forde, 1994).

Retrospective findings have highlighted the chronic nature of social phobia, with as many as 50 to 80% of affected individuals reporting that their struggles began in childhood (Otto et al., 2001; Stemberger et al., 1995). Early onset of social phobia is associated with a more chronic and severe course (Beidel & Turner, 2007). Research has further highlighted the chronic nature of social phobia; retrospective data have suggested that the mean duration of SP is approximately twenty-five years (DeWitt et al., 1999; Kessler et al., 1998). Despite its chronic nature and the negative effects that are associated with social phobia, treatment utilization in this population is particularly low in comparison to other anxiety disorders (Magee et al., 1996). Unfortunately, untreated social phobia is characterized by a chronic and unremitting course (Beidel & Turner, 2007), and longitudinal studies suggest that untreated social phobia can last for years and even decades (Chartier et al., 1998; Keller, 2003).

1.1.1   Models of Social Phobia

Two models of social phobia have been particularly influential in guiding research and treatment

for this disorder. Clark and Wells' cognitive model (e.g., Clark and Wells, 1995; Clark, 2001) suggests that

social phobia develops in response to faulty cognitions. Specifically, individuals with social phobia

believe that, (1) "they are in danger of behaving in an inept fashion, and that (2) "such behavior will

have disastrous consequences in terms of loss of status, loss of worth, and rejection" (pp. 69-70). Safety

behaviors and post-event processing are thought to contribute to the maintenance of faulty cognitions

that underlie social phobia. Safety behaviors are actions that are taken to prevent the occurrence of

feared social outcomes (e.g., avoiding eye contact so others can't see how scared a person is, excessive

preparation to prevent looking "stupid"). Following social interactions, individuals with social phobia

tend to engage in post-event processing (PEP), which is characterized by a detailed review of the social

event or interaction. Unfortunately, negative elements of the social event, including perceived

inadequacies, mistakes, and imperfections tend to dominate PEP for individuals with social phobia

(Rachman, Grater-Andrew, & Shafran, 2000). PEP is thought to perpetuate intrusive maladaptive

cognitions about social interactions and to lower anticipation of success in future social situations

(Abbott & Rapee, 2004; Rachman, Grater-Andrew et al., 2000). Research with clinical samples has

consistently supported the relation between PEP and social anxiety (Abbott & Rapee, 2004; Coles, Turk,

& Heimberg, 2002; Kocovski & Rector, 2008; Perini, Abbott & Rapee, 2006).

Rapee & Heimberg's (1997) model is based on the notion that individuals with social phobia

assume that others are fundamentally critical and are likely to evaluate them negatively in social

situations. Furthermore, individuals with social phobia tend to attribute significant importance to being

perceived positively by others. Thus, the model suggests that individuals with social phobia generally

overestimate the probability and costs of performing poorly in social situations and/or being negatively

evaluated by others. Rapee & Heimberg (1997) identified a number of cognitive and behavioral

processes that are thought to contribute to the development and maintenance of social anxiety, including selective attention to external indicators of negative evaluation (i.e., frowns, signs of boredom). Selective attention to negative cues is thought to contribute to increased behavioral and physical symptoms of anxiety, as well as additional misperceptions about how one is seen and perceived by others. A recent extension of Rapee & Heimberg's (1997) social anxiety disorder model highlights imagery as an important component of SAD; the updated model posits that negative images of past social failures contribute the development and maintenance of SAD by increasing anxiety the amount of anxiety experienced in anticipation of and during social exposures, as well as by increasing expectations for negative outcomes (Heimberg, R. C., Brozovich, F. A., & Rapee, R. M., 2010).The models described above have laid a foundation for the development of cognitive behavioral therapies for social phobia. Cognitive interventions generally focus on cognitive processes that impact social phobia. For example, socially anxious individuals often believe that, (1) their social behavior is much more inept than it actually is, (2) their physical symptoms of anxiety are much more apparent to others than they actually are, (3) others perceive them more poorly than they actually do, and (4) the negative consequences or costs of their inept behavior are much more dire than they actually are. Interventions are designed to challenge and modify these distorted patterns of thinking. Behavioral interventions are based on modern accounts of learning theory, and typically involve some form of exposure to the feared stimulus. More specifically, exposure therapy involves repeated confrontation of a feared stimulus, in the absence of a negative/feared outcome, resulting in diminished fear.

1.1.2 Treatments for Social Phobia

The empirical literature supports the efficacy of cognitive-behavioral therapy (CBT) (Antony & Barlow, 1997; Heimburg & Juster, 1995; Turner, Cooley-Quille, & Beidel, 1996). CBT interventions for social phobia incorporate various components, including cognitive therapy, anxiety management training, exposure-based strategies, and social skills training. Furthermore, CBT interventions for social phobia

can be effectively delivered in both group (Heimberg, et al., 1990; Rodebaugh, et al., 2004) and individual (Wells & Papageorgiou, 2001) formats. Two group interventions cognitive behavioral group therapy (CBGT; Heimberg, Dodge, Hope, & Kennedy, 1990) and exposure group therapy (EGT; Hofmann, 2002) have been associated with positive empirical and clinical outcomes. CBGT has received the most empirical support and is currently considered the "gold standard" treatment for social phobia (Heimberg, 2002; Rodebaugh, Holaway, & Heimberg, 2004).

Individual and group cognitive behavioral treatment packages for social phobia have typically relied on in *vivo* and/or imaginal exposure techniques; in fact, there is an extensive body of literature supporting *in-vivo* exposure as the treatment of choice for specific phobias (Barlow et al., 2002). Although these methods of exposure have proven to be effective, they are also associated with a number of drawbacks. For example, *in-vivo* (real world) exposure techniques can pose challenges such as cost, time demands, and threats to confidentiality. Lack of control is another area of concern, as clinicians have little-to- no control over outcomes that occur in the context of real world exposure to the feared stimuli. Imaginal exposure addresses some of the challenges of *in-vivo* exposure, but not without posing its own challenges. Most notably, some individuals have difficulty imagining the feared stimulus.

Virtual reality exposure therapy (VRE) involves confrontation of feared stimuli within a virtual environment, and literature suggests that VRE is an effective medium for conducting exposure therapy. VRE interactive environments typically involve the use of a head-mounted display through which the virtual world is viewed. Head-mounted displays consist of separate display screens for each eye, along with some type of display optics, stereo headphones, and a head tracking device. The perspective on the virtual world changes according to the user's natural head movements and body motion. To date the most extensive and methodologically sound research supporting the efficacy of VRE stems from treatment outcome studies for fear of flying (Rothbaum et al., 2002) and agoraphobia (Botella et al., 2007). Emotional processing theory (Foa & Kozak, 1996) has served as theoretical foundation to support

the use of VRE. According to this theory, the following two conditions are essential in order for exposure to be successful (1) the fear structure must be activated and (2) information that is not compatible with the existing structure must be presented and incorporated. VRE engages various sensory modalities (audio, visual, interoceptive) through which it is able to activate the fear structure. Thus, because it provides a medium through which: (1) the fear structure can be activated and (2) incompatible information can be integrated into the existing structure, theory suggest that VRE may be a promising and effective alternative to *in-vivo* and imaginal exposure.

Initial findings from empirical studies examining VRE in the treatment of social phobia are promising. For example, Anderson et al., (2005) conducted the first open trial of VRE (N = 10) for social phobia, using virtual environments to create public speaking scenarios; they found that participants receiving VRE rated themselves as significantly improved on fear of public speaking measures at the conclusion of treatment. Next, Klinger, Bouchard, et al. (2005) evaluated the efficacy of VRE in comparison to group CBT in a sample of individuals (N = 36) with social phobia; post-treatment findings indicated that individual VRE and group CBT were equally effective at reducing symptoms of social phobia. Wallach and colleagues (2009) explored VRE in the treatment of social phobia (N = 88) during which they compared CBT alone to CBT plus VRE versus a wait list control. Findings indicated that CBT was as effective as CBT plus VRE; further both treatments were superior to the waitlist condition. Interestingly, twice as many participants dropped out of the CBT condition than dropped out of CBT plus VRE (Wallach et al., 2009).

In addition to CBT treatments, the empirical literature supports the use of a number of pharmacological interventions for social phobia, including benzodiazepines, selective serotonin reuptake inhibitors (SSRI's), monoamine oxidase inhibitors (MAOIs), and beta-adrenergic blockers. SSRI's are often considered to be the most appropriate first line of pharmacological treatment for generalized social phobia because they are relatively safe and generally well-tolerated. Several controlled double-

blind trials have yielded evidence supporting the superiority of SSRI's including fluvoxamine (Stein, Fyer, Davidson, Pollack, & Wiita, 1999), sertraline (Van Amerigen et al., 2001), and paroxetine (Baldwin, Bobes, Stein, Scharwachter, & Faure, 1999) over placebo medications, in the treatment of social phobia. Another class of medications commonly prescribed in the treatment of social phobia is non-selective beta blockers, such as propranolol. Propranolol was originally developed and prescribed for the treatment of hypertension. However, because of its pharmacodynamic properties, propranolol is also effective in reducing symptoms of autonomic arousal (i.e., tachycardia, palpitations, and tremor) for individuals with social phobia (Hansen et al., 2008). Finally, phenelzine is in a class of medications called monoamine oxidase inhibitors (MAOIs). Findings from a randomized, double blind trial revealed that phenelzine was associated with positive treatment outcomes, including reductions in avoidance and anxiety for individuals with social phobia (Liebowitz, et al., 1992).

Although they are sometimes prescribed in the absence of other treatment interventions, medications for social phobia are commonly given in conjunction with other cognitive and behavioral interventions, such as exposure therapy. Concurrent use of medication during exposure therapy is thought to increase the likelihood that individuals will engage in treatment by making exposures less aversive and more tolerable. Findings from previous treatment outcome studies comparing combined treatment (medication plus CBT) to CBT treatment alone have yielded mixed results. For example, Heimberg and colleagues (1998) compared the efficacy of phenelzine, CBGT, their combination, and a pill placebo in the treatment of social phobia. Post-treatment findings indicated that combined phenelzine and CBGT was more superior to placebo than either CBGT or phenelzine alone (Heimberg, et al., 2002). Contrastingly, findings reported by Davidson et al. (2004) indicated that both CBT and fluoxetine are superior to pill placebo according to post-treatment measures of social phobia, but that there was no advantage to combining CBT with fluoxetine (Davidson et al., 2004). Thus, whether used

alone or in combination with other cognitive and behavioral treatments empirical findings have supported the value of pharmacological interventions for social phobia.

In summary, previous findings support the efficacy of various cognitive behavioral and pharmacological interventions in the treatment of social phobia. Despite the strong evidence that these interventions are efficacious at post-treatment, as detailed below, we know less about the long term maintenance of social phobia treatment gains.

1.2   Long-term Outcomes in the Treatment of Social Phobia

As a whole, social phobia treatment outcome studies have been limited in terms of the extent to which they have examined long term treatment gains. This limitation was first highlighted by Heimberg (1989) when his review of seventeen treatment outcome studies for social phobia revealed an average follow-up length of 5.12 months. Fortunately, a more recent review indicated that research in this area is advancing; Acarturk et al. (2009) identified nine long-term studies with follow-up periods ranging from seven to eighteen months. Given the chronic and often debilitating nature of social phobia, however, it is important to continue to seek additional insight about how individuals fare in the longer term after completing treatment. Existing literature on long-term treatment outcomes for social phobia will be reviewed in the following section. For the purposes of this discussion "long term" outcome will refer to studies that included follow-up assessments that occurred at least two years after the completion of treatment.

Heimberg and colleagues (1993) conducted the first and perhaps most methodologically sound long-term follow-up study of social phobia treatment to date. Participants (N = 40) in the original treatment outcome study (Heimberg et al., 1990) included a sample of individuals meeting diagnostic criteria for generalized social phobia who were randomly assigned to and completed either cognitive behavioral group therapy (CBGT) or educational-supportive therapy (EST). Post-treatment findings revealed significant improvements for both groups, with CBGT being superior to EST on most outcome

measures (Heimberg et al., 1990). Later, Heimberg and colleagues (1993) assessed long-term outcomes of CBGT and EST via a battery of self-report measures, an individualized behavioral test, and a structured interview which was administered by an independent assessor. Participants (N = 19) in the follow-up study were assessed 4.5 to 6.25 years after completing treatment. Long-term-follow-up findings, across all assessment modalities, revealed that CBGT post-treatment gains were maintained and that CBGT participants continued to exhibit significantly fewer social phobia symptoms than EST participants at long-term follow-up. Heimberg et al. (1993) further characterized their findings in terms of clinically significant improvement (e.g., treatment response); 67% of long-term follow-up completers were classified as significantly improved after having shown a two point decrease and an end-point score of three or less (suggesting no further treatment needed) according to observer ratings on the *Clinician's Severity Rating Scale* (DiNardo et al., 1983). It is important to note, however, that the sample of long-term-follow-up completers differed significantly from the original treatment sample in terms of pre-treatment and six-month follow-up symptom severity. Therefore, Heimberg and colleagues (1993) ultimately concluded that, "CBGT is an effective long-term treatment for socially anxious individuals who are initially less impaired".

Fava et al. (1989) investigated the efficacy of an outpatient "homework-exposure" based protocol in the treatment of individuals with generalized social phobia. Post-treatment findings indicated that forty-five (64%) participants no longer met DSM-IV criteria for social phobia. Long-term follow-up participants (N = 45) were individuals who were considered to be in remission, as defined by no longer meeting diagnostic criteria for social phobia and being rated as "much better" according to *Kellner's Global Rating of Improvement* (1972), at post-treatment. Findings revealed that 98% of participants were still in remission two years after treatment and 85 % of participants remained in remission at 5-year and 10-year follow-up (Fava et al., 2001). In sum, these findings yielded evidence

supporting the long-term maintenance of treatment gains for an individual, homework-based social phobia treatment protocol.

Two studies have examined the long-term efficacy of internet-delivered cognitive therapy for social phobia. Hedman et al. (2011) examined long-term outcomes of internet-based CBT at one year (N = 71) and at five years (N = 71) after treatment had ended. Primary outcome measures included the *Liebowitz Social Anxiety Scale* (LSAS), the *Clinical Global Impression of Improvement* (CGI-I; Guy, 1976) scale, and the *Structured Clinical Interview for the DSM-IV-TR* (SCID; 2002). Results revealed significant improvements from post-treatment to one year follow-up which were sustained five years after the completion of treatment. The researchers defined clinically significant change in terms of diagnostic status and clinician ratings on the CGI-I, with 48% of participants no longer meeting diagnostic criteria and 64% being rated as "much improved" on the CGI-I at five year follow-up. Similarly, in Carlbring et al.'s (2009) 2.5 year follow-up of internet-delivered CBT participants (N = 44) demonstrated significant improvements, according to self-report ratings of social phobia, from pre-treatment to post-treatment as well as from post-treatment to 30 month follow-up indicating that treatment gains were not only maintained but also improved upon during the follow-up period.

Willutski et al. (2012) examined the long-term efficacy of manualized cognitive therapy and combined resource oriented cognitive behavioral therapy (ROCBT), which seeks to build upon a patient's existing resources by highlighting past successes in treatment. More specifically, ROCBT therapists focus on the activation, clarification, and use of exceptional situations (e.g., situations when the problem was less strongly pronounced or when the individual behaved in accordance with his/her goals). Outcomes were measured via participant (N = 27) ratings on the *Social Phobia Scale* (SPS; Mattick & Clarke, 1998), *Social Interaction Anxiety Scale* (SIAS; Mattick & Clarke, 1998), *Fear of Negative Evaluation* (FNE; Watson & Friend, 1969), and the *Social Avoidance and Distress Scale* (SAD; Watson & Friend, 1960); no behavioral or clinician rated measures were used. Findings, based on self-report ratings, revealed that

long-term follow-up participants had not only maintained post-treatment gains at ten year follow-up but had also made significant improvements over the course of the follow-up period on two of four the primary self-report, social phobia outcome measures; this finding held true even after individuals who reported receiving additional treatment (26%) during follow-up were excluded from the analyses.

Next, Mortberg, Clark, & Bejerot (2011) conducted a five-year follow-up of individuals who had participated in their randomized clinical trial (Mortberg et al., 2007) comparing the efficacy of Intensive Group Cognitive Therapy (IGCT) to Individual Cognitive Therapy (ICT) in the treatment of social phobia. Follow-up measures included a battery of self-report measures, including the FNE, LSAS, and the SCID which was administered by an independent assessor. Results indicated long-term follow-up participants (N = 48) had maintained and improved upon post-treatment gains at long-term follow-up according to self-report ratings of social anxiety. Moreover, 74% of participants (n = 29) who completed the SCID at long-term follow-up no longer met diagnostic criteria for social phobia.

Two studies have examined long-term outcomes of social skills based treatment interventions for social phobia. Turner, Beidel, and Cooley-Quille (1995) examined the long –term effectiveness of Social Effectiveness Therapy (SET); SET is reported to include psychoeducation, social skills training, in vivo and/or imaginal exposure, and programmed practice. Post-treatment findings suggested that the majority (84%) of participants (N = 13) reported moderate to high rates of improvement. Long-term follow-up results indicated that treatment gains were maintained two years after treatment had ended for long-term follow-up participants (N=8). Furthermore, findings revealed a significant difference between post-treatment and follow-up self-reported fear symptoms indicating that participants continued to improve during the follow-up period, after treatment had been ended. Stravynski et al. (2000) evaluated the long-term maintenance of a behavioral group intervention which focused specifically on improving social skills and interpersonal functioning. Initial findings revealed that all treatment completers (N=4) had improved to the extent that they no longer met diagnostic criteria for

social phobia by six month follow-up. Moreover, long-term follow-up participants (N=4) had maintained

gains and continued to not meet criteria for social phobia at two year follow-up.

While findings have generally been promising, researchers examining long-term outcomes of

social phobia interventions have also identified shortcomings in the current body of literature. For

example, some of these studies are characterized by small sample sizes [Turner et al., 1995 (N = 8, 62%

of treated sample); Heimberg et al., 1993 (N = 19, 48% of treated sample); Stravynski et al., 2000 (N = 4,

100% of treated sample)]. Related, response rates have varied greatly across studies with some

reporting rates as low as 31% (Willutski et al., 2012; N = 27) while others have reported rates as high as

89% (Hedman et al., 2011; N = 71). Additionally, some research has relied solely on self-report

measures (Willutski et al., 2012). Next, in some studies, the follow-up sample differed significantly from

the original sample of treatment completers (Heimberg et al., 1993; Fava et al., 2001). For example,

Heimberg et al.'s (1993) sample of follow-up completers reported significantly fewer symptoms of social

phobia at pre-treatment and six month follow-up than did individuals who did not complete the long-

term follow-up. Selection bias is another methodological limitation of previous literature long-term

follow-up investigations of homework based exposure (Fava et al., 2001) and interpersonal-focused

behavioral group therapy (Stravinsky et al., 2000) were limited to individuals who were in remission at

post-treatment.

In summary, although existing literature regarding the long-term maintenance of treatment

gains for social phobia is not without its shortcomings, as a whole, CBT interventions have generally

yielded positive long term outcomes. The long-term maintenance of CBT treatment gains is not

surprising given that CBT approaches to therapy are designed to provide individuals with the training

and skills needed to function as their own therapists so that they are able to continue to apply what

they have learned in therapy in "real world" settings after therapy is finished (Beck, 1995).

1.2.1   Long-term Outcomes of Virtual Reality Exposure Therapy

Safir and colleagues (2012) conducted the only long-term follow-up study of a randomized clinical trial testing VRE for social fears—findings from this study, based on participants' self-report ratings, revealed that socially fearful individuals generally maintained VRE post-treatment gains at one year follow-up (Safir et al., 2012). Outside of the social phobia literature, Wiederhold and Wiederhold (2003) explored the long-term efficacy of VRE for fear of flying (FOF) and found that VRE treatment gains were maintained at 3-year follow-up. Additionally, Rothbaum and colleagues (2000; 2002) examined the efficacy of VRE and standard *in vivo* exposure therapy for FOF; findings indicated that treatment gains were maintained at 6-month and 12-month follow-up for both treatment groups (Rothbaum et al., 2002). These findings were replicated with a larger sample (N=75) with identical results, including long-term follow-up (Rothbaum et al., 2006). Interestingly, subsequent research suggests that many of the participants who completed treatment during the original outcome studies continued to maintain or improve upon gains made during treatment, even in the aftermath of a catastrophic fear-relevant event, the September 11, 2001, terrorist attacks (Anderson, Jacobs, Linder, Edwards, Zimand, et al., 2006).

1.2.2   Long-term Outcomes of Pharmacological Interventions

There is a strong body of literature indicating that medication alone and in combination with other CBT treatments for social phobia is associated with increased rates of improvement at post-treatment (Liebowitz, 1999; Clark, 2003). However, long-term follow-up data suggest that these positive outcomes are generally not well maintained following the discontinuation of medication. For example, post-treatment results from a randomized controlled trial indicated that phenelzine (an MAOI) was not only superior to placebo, but also was associated with more rapid response rates than CBGT during treatment (Heimberg, 1998). However, when the researchers examined relapse rates at 6 month follow-up, they found that 33% of those previously treated with phenelzine had relapsed, while none of those previously treated with CBGT had relapsed (Liebowitz et al., 1999). Next, Blomhoff and colleagues

(2001) found that sertraline (an SSRI) outperformed exposure therapy in a primary care sample of individuals with social phobia at post-treatment. Nevertheless, twelve month follow-up data suggested that participants treated with exposure continued to improve during the follow-up period, while those treated with sertraline alone, or in combination with exposure treatment, tended to deteriorate after treatment was terminated (Haug et al., 2003). Concomitant use of benzodiazepines during exposure treatment for social phobia also has been associated with higher rates of relapse (Fava et al., 2001). Thus, there is a strong body of literature suggesting that relapse rates after the discontinuation of effective pharmacotherapy treatments are significantly higher than relapse rates following the successful discontinuation of CBT. In addition to these findings, theoretical perspectives and empirical research regarding the role of extinction learning in exposure therapy suggest that pharmacotherapy may attenuate responses to CBT for social phobia. In the next section, we review the theoretical foundations of exposure therapy before discussing the potential impact of pharmacological interventions on exposure.

1.2.3   Theoretical Foundations of Exposure Therapy

Exposure therapy involves repeated confrontation of a feared stimulus in the absence of a negative/feared outcome, resulting in diminished fear. Researchers have examined and identified several mechanisms through which exposure therapy is thought to decrease fear and anxiety. Research in this area has relied heavily on learning theory principles of classical and operant conditioning. According to classical conditioning theory, fear develops through the following process: (1) repeated pairing of a previously neutral stimulus with an unconditioned stimulus that innately evokes discomfort or fear; (2) causing the neutral stimulus to become associated with aversive properties to the extent that it ultimately (3) becomes a conditioned stimulus that elicits an anxiety response, on its own, in the absence of the unconditioned stimulus (Pavlov, 1927; Rescorla & Wagner, 1972). Operant conditioning theory is based on the principles of reinforcement and punishment whereby reinforcement increases the frequency of a

targeted behavior while punishment decreases the frequency of a behavior (Skinner, 1938). Mowrer's two-stage model (1939, 1960) represents one of the first significant attempts to elucidate the mechanisms underlying fear acquisition and exposure therapy. Mowrer suggested that fears are acquired through classical conditioning and maintained through negative reinforcement (i.e., avoidance of the feared stimulus is reinforced as a result of decreased fear/anxiety). In the context of Mowrer's theory, exposure is thought to directly reduce avoidance behaviors and abolish learned fear via direct confrontation of the feared stimulus. Critics of Mower's theory have cited lack of synchrony among the components of fear responding (i.e., subjective self-report, physiological arousal, and avoidance behavior) as evidence to refute a direct causal link between fear and avoidance (Rachman, 1976).

Fear reduction during and after exposure therapy also has been attributed to the process of habituation. Habituation is defined as a "decrement in response as a result of repeated stimulation" (Thompson & Spencer, 1966, p.17). Tryon (2005) highlighted additional defining features of habituation, including : (1) prolonged exposure leads to decreased fear over time; (2) a dishabituated (fear) response is inevitable in the absence of exposure; (3) the habituated response (decreased fear) returns quickly in the presence of additional exposure; and (4) reduced fear responses are not attributed to new learning. As reviewed by Moscovitch, Antony, & Swinson (2009) , the following clinical observations and empirical findings are cited as evidence against habituation theory: (1) individuals do not always experience decreased anxiety even after lengthy exposure; (2) contrary to the notion that dishabituated responses occur in the absence of exposure, relapse rates after exposure therapy are far less than 100%; and (3) relapse periods are not always transient—experiences of fear do not always diminish quickly even in the presence of additional exposure (i.e., booster sessions).

More recently developed theories purport that extinction is the primary mechanism through which exposure therapy leads to decreased fear and anxiety. Extinction is described as process of new, active learning that occurs with repeated, systematic confrontation of a feared or conditioned stimulus (i.e.,

speaking in front of others) in the absence of an unconditioned stimulus (i.e., bad outcome) (Rescorla, 2001). According to extinction theory, through the experience of repeated pairings of the CS in the absence of the US (i.e., exposure therapy) individuals will begin to attribute new meanings to the CS. For example, in the case of speaking anxiety, exposure therapy sets the stage for learning, such that a new association between public speaking and safety (absence of a bad outcome) develops. Rather than eliminating negative associations that existed prior to treatment, new associations (meanings) between the CS (speaking in public) and safety learned during exposure therapy come into co-existence with the negative associations that existed before treatment. Thus, when confronting the CS (public speaking) after successful exposure therapy, individuals must choose between two competing meanings of the CS (1) fear, something bad will happen or (2) safety. In sum, extinction theory purports that new associative learning mediates the relationship between exposure and fear reduction.

1.2.4   *Potential Impact of Pharmacological Interventions on Exposure*

Extinction learning is heavily dependent on context, and thus it is imperative that the context in which the feared stimulus is presented during exposure therapy matches the context in which the fear cue is likely to be confronted after treatment has ended. Within this framework, relapse is described as a persistence of the original conditioning events in memory (public speaking—bad outcome) that are reactivated by contexts other than those that are associated with successful exposure therapy. The notion of context dependent learning is evocative of the concept of state dependent learning (SDL), which occurs when learning acquired in one context is not retrievable in a different context (Overton, 1991). SDL is an important concept to consider when pharmacological interventions serve as an adjunct to exposure therapy in the treatment of social phobia. Given the context-dependent nature of extinction learning during exposure therapy, SDL may occur when combined treatment methods (medication plus therapy) are implemented in the treatment of anxiety disorders. According to proponents of SDL , "if the medicated state serves as a context for learning during exposure therapy, treatment gains could

potentially be lost following drug discontinuation" (Morissette, Spiegel, & Barlow, 2008, p.211). To

illustrate, a person receiving VRE for social phobia while taking an SSRI, who completes psychotherapy

and then subsequently discontinues the SSRI may encounter difficulties (return of symptoms) as a result

of having to retrieve safety memories in a different context (no medication) other than the context in

which safety memories were developed during VRE (with medication). Consistent with SDL theory,

research examining the treatment of panic disorder (Marks et al., 1993) and fear of flying (Wilhelm &

Roth, 1997) has yielded evidence to suggest that concurrent use of medication during exposure therapy

may interfere with short term and long term treatment outcomes. Whereas little is known about the

role of SDL from a social phobia treatment outcome perspective, preliminary findings (Morissette et al.,

2008) suggest that additional research in this area is warranted.

Morissette, Spiegel, & Barlow (2008) conducted the first empirical study designed to explore SDL

within the context of combined exposure and pharmacotherapy in the treatment of social phobia.

Participants included (N=4) individuals meeting diagnostic criteria for social phobia who engaged in a

series of situational exposures while taking either alprazolam (.75mg), propranolol (40mg), placebo, or

no medication. Next, forty-eight hours after engaging in the original exposure exercise, participants

were asked to engage in the same situational exposure in the absence of medication. This design

allowed the researchers to examine the retention of learning after a shift in context (i.e., medicated

versus non-medicated). Findings indicated that participants were more likely to maintain treatment

gains following situational exposures that occurred in the absence of concurrent medication. More

specifically, participants who encountered exposure treatment in the same context (non-medicated) in

which the feared stimulus was encountered at follow-up (non-medicated) were more likely to report

long-term treatment gains and thus these findings provided additional support for the notion of SDL.

Other pharmacokinetic properties of anxiety medications and their effects on exposure

treatments have been considered as well. For example, some have theorized that anxiety medications,

such as propranolol, may inhibit the new (extinction) learning that is thought to occur during exposure therapy because of its pharmacokinetic properties. One of the primary actions of propranolol is to inhibit norepinephrine, a neurotransmitter that is thought to enhance memory consolidation. Previous findings have shown that individuals given propranolol immediately after a traumatic experience show less severe symptoms of PTSD compared to their respective control groups that did not receive the drug (Vaiva et al., 2003). These findings support the notion that propranolol may interfere with memory consolidation in the aftermath of a traumatic event. While propranolol's supposed hindrance of memory consolidation can be conceptualized as a positive outcome in the case of trauma (lessens the likelihood of intrusive, unwanted post-traumatic memories), decreased memory consolidation during exposure therapy for social phobia is likely to be associated with negative outcomes. Furthermore, because extinction learning thought to occur during successful exposure therapy involves the consolidation of new memories, there is reason to believe that concurrent use of propranolol may also interfere with exposure based interventions for social phobia. In summary, research and theory has identified several mechanisms that are thought to account for response to exposure therapy, including theories of state dependent and extinction learning. Additional research in this area is needed in order to further understand the extent to which theories of SDL and extinction learning may or may not account for combined CBT and pharmacological treatment outcomes for social phobia.

2 CURRENT STUDY

2.1 Objectives

The present study sought to examine the extent to which cognitive-behavioral treatment gains for social phobia are maintained in the long-term, after treatment has ended using a multi-modal assessment approach. A secondary aim was to examine whether concurrent use of medication during treatment attenuates long-term responses to exposure therapy. The specific hypotheses are as follows:

2.2 Hypotheses

Hypothesis 1: Treatment completers will exhibit fewer social phobia symptoms at long-term follow-up, relative to pre-treatment, as assessed by self-report and behavioral measures.

Hypothesis 2: Post-treatment gains will be maintained over the long-term follow-up period for individuals who completed treatment.

Hypothesis 3: Concurrent medication use, during treatment, will be associated with diminished treatment gains at long term-follow-up for individuals who have discontinued medication during the follow-up period.

2.3 Methods

The present study was a long-term follow-up of two larger social phobia treatment studies. The first study (Anderson, Price, Edwards, Obasaju, et al., 2013) was funded by the National Institutes of Mental Health (NIMH) and compared Exposure Group Therapy and Virtual Reality Exposure Therapy for social phobia to wait-list controls using a randomized, controlled design. The second study was funded by the Anxiety Disorders Association of America and examined amygdala activity as a predictor of treatment response to VRE using functional magnetic resonance imaging, in an uncontrolled trial with a small sample. For the purposes of the current long-term follow-up, the procedures for the parent studies were the same, with the exception that participants in the fMRI study were not randomly

assigned to treatment; they all received VRE. Figures 1 and 2 were prepared in accordance with

guidelines outlined in the CONSORT (Consolidated Standards of Reporting Trials; Altman, et al., 2001)

and TREND (Transparent Reporting of Evaluations with Nonrandomized Designs; Des Jarlais, Lyles,

Crepaz, 2004) statements. The figures show the flow of participants through the two treatment studies.

Eligible participants for the two parent studies were English speaking individuals who met DSM-

IV (APA, 2000) criteria for a primary diagnosis of social phobia, as assessed by *the Structured Clinical*

Interview for the DSM-IV (SCID; First, Gibbon, Spitzer, & Williams, 2002), with a predominant fear of

public speaking. Individuals on psychoactive medication were required to be stabilized on their current

medication(s) and dosage(s) for at least 3 months and were to remain at the stabilized dosage

throughout the course of the study. Individuals meeting any of the following criteria were excluded, (a)

history of mania, schizophrenia, or other psychoses; (b) recent suicidal ideation; (c) current alcohol or

substance dependence; (d) inability to tolerate the virtual reality helmet/environment; (e) history of

seizures. Recruitment methods included newspaper advertising, posted flyers, internet based outlets, as

well as referrals from local area professionals and other study participants.

2.3.1   Participants - Eligible for Long-term Follow-up

Taken together the two parent studies yielded a treated sample (N = 75) of individuals who had

completed either VRE (n = 42; 56%) or EGT (n = 33; 44%) for social phobia. The treated sample included

individuals with a primary diagnosis of either generalized (n = 34; 45.3%) or non-generalized social

phobia (n = 41; 54.7%). Participants ranged in age from 19 to 69, with an average age of 40 (SD = 11.62).

Study participants self-identified as "Caucasian" (n = 39), "African-American" (n = 21), "Latino" (n = 4),

Asian American (n = 3), Chinese (n = 1), Eritrean American (n = 1), Arabic (n = 1), African (n = 1), Biracial

(n = 2), and "other-not specified" (n = 2). For the most part, treatment completers were well educated,

with 67% attaining an undergraduate degree or higher. Finally, 51% of the treated sample reported their

relationship status as married.

The projects were approved by the Institutional Review Board of Georgia State University. Eligibility for the parent studies was determined through a two part process consisting of a brief telephone screening and a subsequent in-person, pre-treatment assessment. After expressing interest and consenting to complete a telephone screening, study candidates completed a short phone interview to determine their initial eligibility. Initial telephone screenings were conducted by doctoral level students in the clinical psychology program at GSU and consisted of a series of questions related to mood, anxiety, and substance use. Those who were not excluded during the telephone screening were given the opportunity to participate in an in-person, pre-treatment assessment at Georgia State University. Consent was obtained prior to the pre-treatment assessment as well. The pre-treatment assessment included a structured diagnostic clinical interview (SCID-IV), administered by a doctoral student, a behavioral avoidance task, and a battery of self-report measures. Eligible Study 1 (FOPSII) participants were randomly assigned to VRE, EGT, or WL. Eligible Study 2 (FMRI) participants were all assigned to VRE.

2.3.2   Assessments

During the pretreatment assessment, participants met with a doctoral student in clinical psychology. The SCID was administered to determine if the participant met criteria for social anxiety disorder and other comorbid disorders. Assessors were trained and supervised by a licensed clinical psychologist. Furthermore, all diagnostic assessments were videotaped and a randomly selected subset were reviewed by a licensed psychologist to calculate the inter-rater reliability (100% agreement for primary diagnosis). In addition, participants were asked to complete a behavioral avoidance task (BAT) during the pretreatment assessment and then again after completing treatment. The pretreatment and post-treatment BATs were optional, they did not impact study eligibility or treatment participation. It was ensured that participants received different topics at pre-and post-treatment. BAT speeches were

videotaped and were conducted in front of audiences that consisted of between one and three

members of the research staff.

Also, the three month follow up was conducted in person and consisted of completion of the full

battery of self-report measures. The SCID was used, at three month follow-up, to reassess the diagnostic

status endorsed during the pre-treatment assessment. All pre-treatment and follow-up assessments

were conducted by doctoral students who were blind to the type of treatment received. For the 12

month follow up assessment, participants were mailed the full battery of self-report measures and

asked to complete and return them via provided, self-addressed stamped envelopes. Compensation was

provided to participants who completed the self-report battery of measures administered at post-

treatment, three, and 12 month follow-up.

2.3.3   Treatment

Prior to administering therapy study therapists attended two-day intense training workshops,

led by the developers of the respective treatments. Each of the study therapist also received weekly

supervision by the primary investigator of the study. Ratings of treatment integrity and competence

were completed, by the developers of the respective treatments, for a randomly selected subset of the

sessions.

The VRE and EGT treatment groups were designed to be as similar as possible, with the

exception of the modality for the delivery of exposure. Both treatments specifically targeted public

speaking fears and relied on exposure therapy as the primary intervention for treating social phobia. The

two treatments included cognitive restructuring exercises and video-taped feedback. Both treatments

sought to address specific aspects of social phobia identified in psychopathology literature, including

self-focused attention, distorted perceptions of self and others, perceptions of emotional control,

rumination, and realistic goal setting for social situations. Also, both treatments consisted of eight

therapy sessions conducted over a period of approximately eight weeks. The mechanism and setting

through which exposure was delivered varied for each of the two treatment groups. Individual study therapists relied on the virtual environment (VRE) to facilitate exposure to public speaking fears, while group therapists relied on other group members (EGT) to help facilitate exposure.

Virtual reality exposure (VRE) was implemented according to a manualized treatment protocol and was administered individually by either a licensed clinician or an advanced doctoral student in the clinical psychology program. During session one, participants were introduced to the VRE treatment rationale and taught how to identify and rate their anxiety on a subjective units of discomfort scale (SUDS). Breathing training also was introduced. Session two began with a review of the treatment rationale and otherwise focused on teaching the concept of cognitive restructuring, including its purpose and practice. Session three focused on self-perceptions during public speaking. During this session, participants reviewed video of their pretreatment speeches and were asked to compare how anxious they looked on the video to how anxious they rated themselves while giving the speech. Session four focused on identifying the role that both safety behaviors and self-focused attention can play in the maintenance of social phobia. Participants were first videotaped demonstrating their most commonly used safety behaviors while giving a prepared talk. Next, participants were instructed to focus their attention on the audience and to refrain from using safety behaviors while they were being videotaped giving the same talk. Then, participants were able to observe the two videos to see how their performances differed when they focused on the audience while giving their talk versus when they engaged in safety behaviors and self-focused attention while speaking.

Exposure exercises were conducted during sessions five through eight using the virtual audience. During VRE exposure exercises participants were fitted with a head mounted display , that contained screens for each eye, stereo headphones and a head tracking device, through which they were exposed to one of three virtual environments. VR exposure environments included a virtual conference room (~5 audience members), a virtual classroom (~35 audience members), and a virtual

auditorium (appearance of 100+ audience members). VRE therapists had the ability to manipulate the reactions of the audience in a number of ways including making them appear interested/bored, supportive/hostile, distracted (i.e., cell phone ringing), as well as the ability to manipulate the difficulty of questions that were posed by the audience. Virtual environments were manipulated according to the client's goals for treatment and their pre-constructed fear hierarchy. Participants were exposed to each item on their hierarchy until their reported fear was reduced by 50 percent before being exposed to their next item on the hierarchy. Treatment concluded with a review of the different anxiety management and relapse prevention strategies.

Exposure group therapy (EGT; Hofmann, 2002) consisted of eight group sessions of manualized treatment over a period of eight weeks which were co-led by a licensed clinical psychologist and an advanced doctoral student. Groups consisted of up to five participants. During session one, participants were introduced to the EGT treatment rationale, including the theoretical basis for exposure therapy. Session two began with a review of the treatment model, participants were then asked to engage in their first exposure exercise which consisted of giving a brief speech about the social phobia treatment models in front of the group. Furthermore, self-perceptions were addressed in session two and video from each client's treatment model speech was used as a mechanism to help participant's highlight discrepancies between how anxious they appeared on video to how anxious they rated themselves prior to viewing the video. Group members were also asked to provide each other with positive feedback when the videotaped speeches were reviewed. Sessions three through six followed a similar model to that of session two. Session seven includes real-world exposure exercises. During this session participants exited the lab to engage in social mishap exercises on the Georgia State University Campus. The social mishap exercises provided participants with opportunities to evaluate their beliefs about social threats and costs, by intentionally engaging in flawed social behaviors in a real world setting, while still in the presence of continued support from other group members/therapists. The final session

provided participants with tools to prevent relapse and included a review of what was learned over the course of therapy.

In addition, Study 1 included a wait list condition which lasted eight weeks after which participants completed a battery of post WL questionnaires similar to the battery that is administered after both the EGT and VRE treatments. Then, WL participants were randomly assigned to either VRE or EGT and received the same 8 week treatment protocol described above.

Ratings of adherence in delivering the EGT and VRE protocols were provided by the developers of the respective treatments for a randomly selected subset of videotaped sessions (14%). Compliance was good for each treatment, with 92% and 93% of the essential elements of the protocol being completed for VRE and EGT, respectively, and one infraction for each treatment arm across all sessions reviewed. Competence in delivering each element was also rated for these sessions, using a 7 point scale (1- very poor to 7-excellent). The competence ratings also were good, with a mean quality rating of 6.1 for VRE and 5.4 for EGT.

2.3.4   Long-term Follow-up Procedures

A brochure was sent to the last known addresses of eligible participants, requesting their participation and updated contact information (i.e., phone number, email address) if applicable. Additionally, we provided a "do not contact" postcard to eligible participants with instructions to return the post card if they did not wish to be contacted or have any further involvement in the study. Approximately three weeks after the brochures/postcards were mailed we attempted to contact eligible participants by phone and/or email to provide additional study information and schedule long term follow-up in-person assessment for those who agreed to participate.

The long-term follow-up assessment took place at Georgia State University and included a structured clinical interview (SCID), a behavioral avoidance task (BAT), and a battery of self-report questionnaires. Clinical interviews were conducted by advanced doctoral students in clinical

psychology; assessors were aware that participants had completed treatment but were blind to treatment condition. All long-term follow-up assessments were videotaped, and a randomly selected subset (N=5) were reviewed by the SCID trained assessment team, which included a licensed psychologist, to calculate the inter-rater reliability (100% agreement for primary diagnosis, with one disagreement on severity). Participants who completed the BAT were asked to deliver a speech to an audience consisting of 3 to 5 research staff; audience members were blind to treatment condition. Those who were unable to complete the in-person, follow-up assessment had the opportunity to complete questionnaires by mail. Participants who completed the in-person follow-up assessment received $50.00 compensation, while those who completed the questionnaires by mail received $25.00 as compensation for their time.

2.3.5   *Participants – Long-term Follow-up Completers*

Participants who previously received and completed either virtual reality exposure treatment (VRE) or exposure group treatment (EGT), in either of the two parent studies, were eligible for the current long-term follow-up study. Of the 75 eligible participants, twenty could not be contacted (e.g., number disconnected, did not return calls), five declined participation, seventeen agreed to take part in the study but never did so (e.g., no showed for assessment, did not return measures, did not return calls to schedule). The long-term follow-up assessment occurred on average 5.5 years after the completion of treatment, with the duration of follow-up ranging from 2.5 years to 6.5 years.   Long-term follow-up completers (N = 34) included individuals with a primary, pre-treatment diagnosis of either generalized (n = 17; 50%) or non-generalized social phobia (n = 17; 50%) who had previously completed either virtual reality exposure treatment (VRE; n = 18) or exposure group treatment (EGT; n = 16). The sample of long-term follow-up completers was predominately female (67%); participants ranged in age from 20 to 69, with an average age of 40 (SD = 12.82). The self-reported ethnic distribution of long-term follow-up completers was as follows: "Caucasian" (n = 18; 53%), "African-American" (n = 10; 29%), "Latino" (n = 2;

6%), "Asian American" (n = 2; 6%), and "Other" (n = 2; 6%). Participants were generally well-educated, with 76% attaining an undergraduate degree or higher. A large portion (38%) of long-term follow-up completers reported an average annual income of $50,000 or more. Lastly, 44% reported their relationship status as married.

2.3.6 Long-term Follow-up Measures

Personal Report of Confidence as a Speaker (PRCS; Paul, 1966): The PRCS is a 30-item self-report questionnaire that measures public speaking confidence across three dimensions: before, during, and after delivering a speech (Appendix A). Items are presented in true-false format and are designed to measure participant's feelings about their most recent speech. Summary scores range from 0 to 30 with higher scores indicating more public speaking discomfort. The PRCS has demonstrated good internal consistency α = .91 (Klorman, Weerts, Hastings, Melamed, & Lang, 1974), adequate validity (Lombardo, 1988), and sensitivity to clinical change (Schutters, van Megen, and Westenberg, 2005) for individuals with social phobia. Internal consistencies for the treatment outcome study were as follows: poor for pretreatment (α = 0.42), good for midtreatment (α = 0.83), good for posttreatment (α = 0.87), good for 3-month follow up (α = 0.88), and good for 12-month follow up (α = 0.87). Because the PRCS focuses on the measurement of public speaking fears (a primary target of both treatment interventions in the current study) and has demonstrated good psychometric properties it was used as a primary outcome measure at long-term follow-up.

Fear of Negative Evaluation - Brief (BFNE; Leary, 1983): The BFNE is a widely used 12 item self-report questionnaire that measures the degree to which individuals fear being negatively evaluated by others across a number of social settings, including public speaking (Appendix B). Ratings are based on responses to items such as, "I often worry that I will say or do wrong things." Items are rated on a 5-point scale ranging from 1 (not at all characteristic of me) to 5 (extremely characteristic of me). Scores range from 12 to 60 with higher scores representing increased evaluative concerns. The BFNE is

reported to have excellent internal consistency (α = .97) as well as test-retest reliability (r = .94) (Collins, Westra, Dozois, & Stewart, 2005). Internal consistencies for the treatment outcome study were as follows: good for pretreatment (α = 0.89), good for midtreatment (α = 0.90), good for posttreatment (α = 0.87), good for 3-month follow up (α = 0.91), and good for 12-month follow up (α = 0.89). Previous findings have indicated that the BFNE is sensitive to therapeutic changes among individuals who underwent CBT for social phobia (Collins, et al., 2005; Weeks et al., 2005).

Liebowitz Social Anxiety Scale– Self Report Version (LSAS-SR; Liebowitz, 1987): The LSAS-SR is a 24 item self report instrument assessing of fear and avoidance across a variety of social interactions and performance situations (Appendix C). Participants use a likert-type scale to provide ratings of fear (0 = none, 1 = mild, 2 = moderate, 3 = severe) and avoidance (0 = never, 1 = occasionally, 2 = often, 3 = usually) for each item. The measure has demonstrated high internal consistency among socially anxious individuals (α = .95) as well as and among individuals without an Axis I disorder (α = .94), appears to have strong convergent and discriminant validity (Fresco et al., 2001), and has demonstrated sensitivity to change (Heimberg et al., 1999). As suggested in the *Consensus Statement on Social Anxiety Disorder (*Ballenger et al., 1998) the LSAS-SR will be used to operationalize treatment *remission* in the current study; more specifically, previous research (Menin, Fresco, Heimberg, et al., 2002) has indicated that the best sensitivity/specificity to identify an asymptomatic state was an LSAS-SR score of <30 and therefore this criteria will be used to qualify treatment *remission* in the current study.

Long term follow-up Questionnaire (LTFQ): The LTFQ was developed specifically for the current study. It includes a variety of qualitative and quantitative self-report questions that are designed to provide a comprehensive assessment of long-term follow-up experiences (Appendix D). Of particular importance to the current study, the LTFQ was used to assess whether participants had sought additional treatment for social phobia over the course of the long-term follow-up period, and if so what kind of treatment they had sought.

Patient Global Impression of Improvement (PGI-I; Guy, 1976): The PGI-I was adapted from the *Clinician Global Impression of Improvement* scale (CGI-I; Guy, 1976) and is a single item rate of change measure based on self-report responses to the following question, "compared to how I felt before beginning this study, I now am." Ratings are based on a seven point scale ranging from 1 (*very much improved*) to 7 (*very much worse*). Global improvement ratings are commonly used in the SP literature (Carlbring et al., 2009; Hedman et al., 2011) as a measure of *treatment response*, defined as a clinically significant reduction in symptoms (Ballenger et al., 1998), and the PGI-I will be used for such purposes in the current study. Participants who rate themselves as either *very much improved* or *much improved* on the PGI-I will be classified as *treatment responders*.

Structured Clinical Interview for the DSM-IV (SCID; First, Gibbon, Spitzer, & Williams, 2002): The SCID is a structured diagnostic clinical interview used to assess psychological disorders based upon the criteria of the DSM-IV. It is widely used across research and clinical settings and is often regarded as the "gold standard" instrument in the assessment and diagnoses of Axis I disorders (Kessler et al., 2006; Shear et al., 2000). The SCID is well validated and it has demonstrated moderate to high inter-rater reliability (Riskind, Beck, Berchick, Brown, & Steer, 1987; Williams et al., 1992) in the diagnoses of Axis I disorders including assessments of social phobia (Antony, Orsillo, & Roemer, 2001) The anxiety, mood, and substance disorder modules were administered at the pre-treatment to assess inclusion and exclusion criteria and co-morbidity of some Axis I disorders. The anxiety module of the SCID was administered at long-term follow-up assessment to assess the presence/absence of current social phobia.

Long-term Follow-up Medication Interview: a retrospective assessment of medication use that was designed specifically for the current study; included questions related to type, indication, dosage, and duration of all medications that were used, amongst our sample of long-term follow-up completers, both during and after treatment (Appendix E).

Behavioral Avoidance Test (BAT): The BAT was based on a standardized speech assessment protocol (Beidel, Turner, & Jacob, 1989) and involves the delivery of an impromptu speech. Participants were first given an index card with 5 randomly selected topics. Examples of the topics included capital punishment, abortion, corporal punishment in schools, same sex marriages, and organ donation. After receiving the index card, participants received three minutes to choose up to three topics and prepare notes for the speech. Participants were asked to try to speak for ten minutes on up to three topics. After completing the BAT, participants rated how well they performed (0-10) and how anxious they felt (0-10), with higher numbers indicating better performance and higher anxiety (Appendix F). Audience members included members of the research team that were not involved with treatment; prior to the entering the room to view the speech, audience members were made aware of BAT procedures (e.g., how topics were assigned, length of participant preparation time for speech), instructed to maintain a neutral stance throughout the speech, and afterwards independently rate (Appendix G) each speaker in regards to their performance and anxiety. BAT audience members were blind to treatment condition. The BAT was administered at pre-treatment, post-treatment, and long-term follow-up. However, audience members were only present at the post and long-term follow-up speeches.
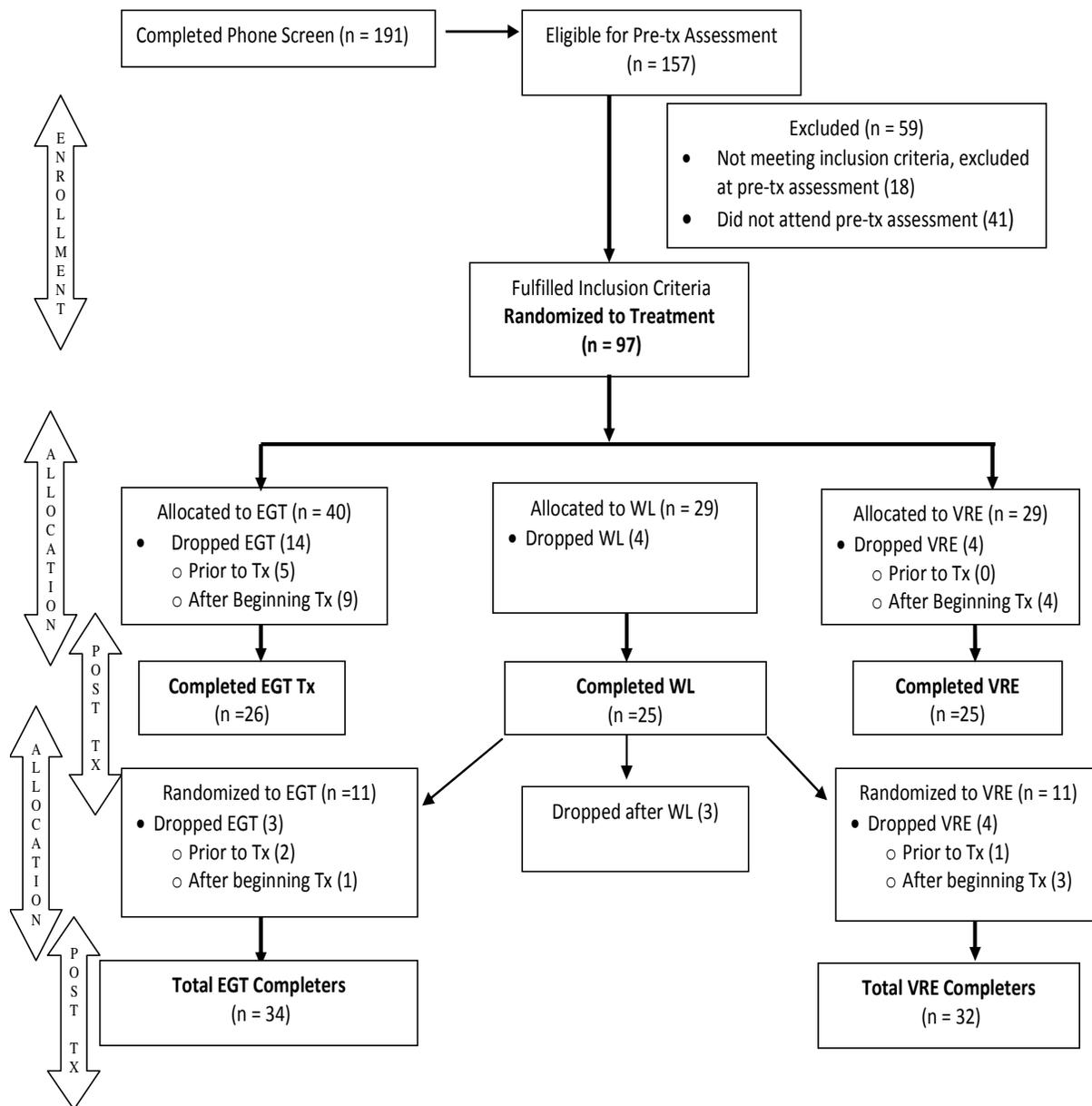
Figure 1. CONSORT participant flow chart for Study 1 (FOPS II)
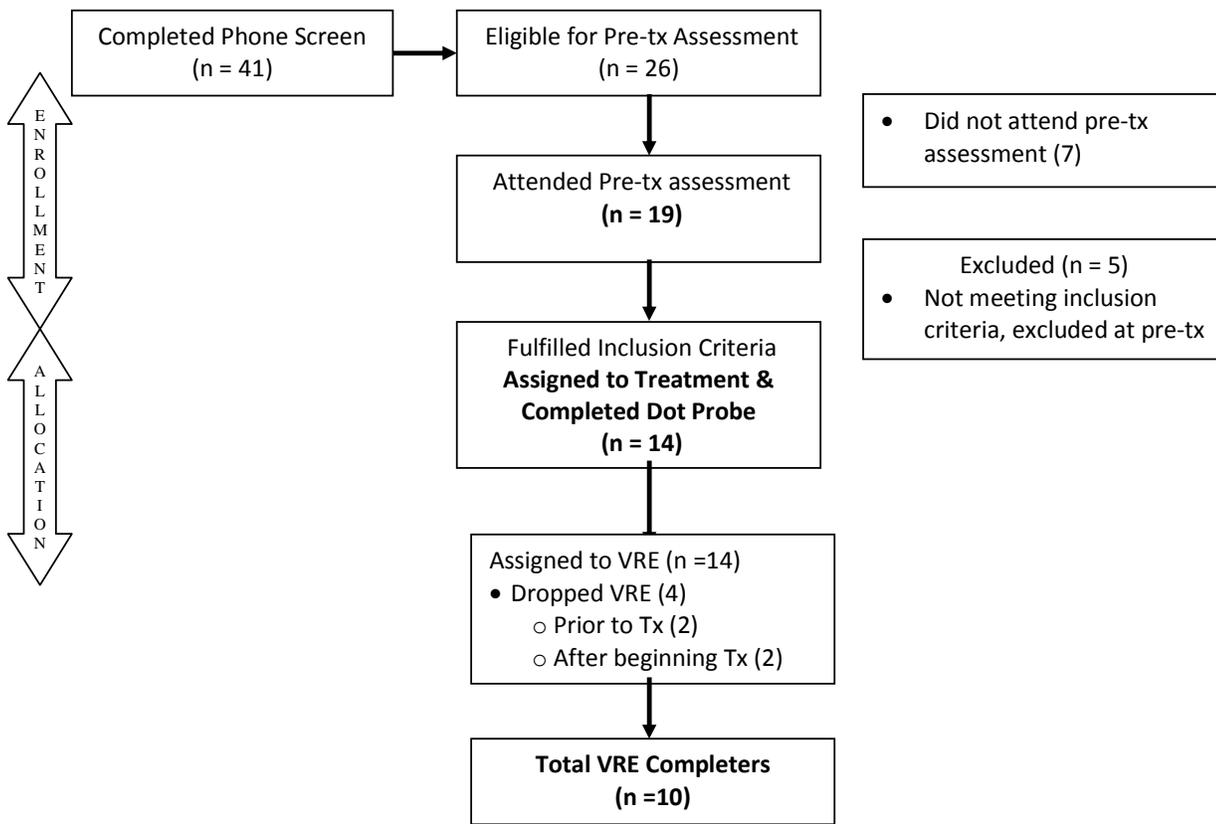
Figure 2. TREND participant flow chart for Study 2 (FMRI)

3   RESULTS

3.1   Preliminary Analyses

Prior to conducting the primary analyses all variables were screened for errors, outliers (defined as scores greater than three standard deviations from the mean), and missing values. No outliers were identified for the primary dependent variables. Descriptive statistics for the primary variables of interest at each assessment point are presented in Table 1. Chi-square analyses indicated that there were no significant demographic differences between long-term follow-up completers and non-completers. A series of t-tests revealed no significant differences in pretreatment symptoms (PRCS, BFNE, LSAS-F, LSAS-A) between long-term follow-up completers and non-completers (see Tables 2 and 3). Moreover, long-term follow-up completers did not differ from non-completers with regards to post-treatment social phobia symptoms (see Tables 4 and 5). For the primary analyses a series of 3 X 2 (Time X Treatment Condition) repeated measures ANOVAs were conducted to test the following hypotheses: (1) that ratings of social phobia would be significantly lower at long-term follow-up in comparison to pre-treatment ratings and (2) that post-treatment gains would be maintained at long-term follow-up.

3.2   Self-Report Measures of Social Phobia

Results revealed a significant main effect of time across each of the primary self-report measures including the LSAS-Avoidance, $F (2, 60) = 19.70$, $p <.001$, partial $\eta2 = .40$, the LSAS-Fear, $F (2, 60) = 20.75$, $p <.001$, partial $\eta2 = .41$, the BFNE, $F (2, 58) = 8.18$, $p <.01$, partial $\eta2 = .22$, and the PRCS, $F (2, 60) = 37.85$, $p <.001$, partial $\eta2 = .56$. Post hoc analyses using Bonferroni-corrected pairwise comparisons revealed that social anxiety ratings were significantly lower at post-treatment, in comparison to pre-treatment ratings, across each of the primary self-report measures: LSAS-Avoidance (*M* difference = -6.83, p < .001), LSAS-Fear (*M* difference = -5.98, p < .001), BFNE (*M* difference = -5.35, p = .003), PRCS (*M* difference = -11.73, p < .001). As hypothesized, long-term follow-up ratings of social

phobia were also significantly lower, in comparison to pre-treatment ratings, for all self-report measures: LSAS-Avoidance (*M* difference = -8.78, p < .001), LSAS-Fear (*M* difference = -8.47, p < .001), BFNE (*M* difference = -5.69, p = .005), PRCS (*M* difference = -9.89, p < .001). No significant differences were observed between post-treatment and long-term follow-up scores: LSAS-Avoidance (*M* difference = 1.98, p = .52), LSAS-Fear (*M* difference = 2.49, p = .07), BFNE (*M* difference = .34, p = 1.00), PRCS (*M* difference = -1.84, p = .84).

With regards to treatment group, no significant main effects were observed on the BFNE, F (1, 29) = .04, p = .85, partial η2 = .00; the LSAS-Fear, F (1, 30) = .53, p = .47, partial η2 = .02; or the LSAS-Avoidance, F (1, 30) = 3.54, p = .07, partial η2 = .16. Moreover, there was no Time X Treatment Group interaction on the BFNE, F (2, 58) = 1.33, p = .27, partial η2 = .04, the LSAS-Fear, F (2, 60) = .56, p = .54, partial η2 = .02, or the LSAS-Avoidance, F (2, 60) = 1.32, p = .27, partial η2 = .04. However, there was a significant main effect of treatment group on the PRCS, F (1, 30) = 4.82, p =.036, partial η2 = .14. Moreover, the main effects of time and treatment group on the PRCS were qualified by a significant Time X Treatment Group interaction, F (2, 60) = 5.39, p = .007, partial η2 = .15. The Time X Treatment group interaction on the PRCS was further probed by testing for the simple main effects of treatment group at each time point; results revealed that EGT participants reported significantly lower PRCS scores, in comparison to VRE participants, at post-treatment, F (1, 33) = 16.77, p < .001, partial η2 = .34, but not at pre-treatment, F (1, 33) = 2.91, p = .09, partial η2 = .08, or at long-term follow-up, F (1, 31) = 1.60, p = .22, partial η2 = .05.

3.3 Behavioral Ratings

3.3.1 *Behavioral Avoidance Task – Participant Ratings*

Next, a 3 X 2 ANOVA (Time X Condition) was used to analyze participant ratings of anxiety and performance on the behavioral avoidance task (speech). For participant ratings of anxiety,

there was a significant main effect of time, $F (2, 36) = 4.22$, $p = .023$, partial $\eta^2 = .19$, but not for treatment group, $F (1, 18) = .18$, $p = .68$, partial $\eta^2 = .01$, or for the Time X Group interaction, $F (2, 36) = 1.39$, $p = .26$, partial $\eta^2 = .07$. Post hoc pairwise comparisons showed that participants' anxiety ratings were significantly lower at long-term follow-up in comparison to pre-treatment (*M* difference = -1.54, p < .05). No significant differences were observed for between pre-treatment and post-treatment (*M* difference = 1.44, p = .07) or post-treatment and long-term follow-up (*M* difference = .104, p = 1.00) for participants' rating of anxiety. Similarly, for participants' rating of performance, there was a significant main effect of time, $F (2, 34) = 16.76$, $p <.001$, partial $\eta^2 = .49$, but not for treatment group, $F (1, 17) = .03$, $p = .88$, partial $\eta^2 = .00$, or for the Time X Group interaction, $F (2, 34) = .87$, $p = .43$, partial $\eta^2 = .05$. Post hoc pairwise comparisons showed that participants rated their speech performance as significantly better at post-treatment (*M* difference = 3.44, p < .001) and at long-term follow-up (*M* difference = 1.84, p = .05) in comparison to pre-treatment. Of note, there was also a significant difference between long-term follow-up and post-treatment participant rated performance scores (*M* difference = 1.60, p < .05) with participants rating their performance better at post-treatment than at long-term follow-up.

3.3.2   *Behavioral Avoidance Task – Audience Ratings*

The pre-treatment behavioral avoidance task did not include an audience therefore the following results are based on comparisons of post-treatment and long-term follow-up audience ratings. Results indicated that audience members rated participants similarly, in terms of anxiety and performance, at post-treatment and long-term follow-up. Specifically, we did not observe a main effect of time for audience-rated performance, $F (1, 16) = .03$, $p = .86$, partial $\eta^2 = .86$ or for audience-rated anxiety, $F (1, 16) = 9.74$, $p = .07$, partial $\eta^2 = .19$. Moreover, the effect of treatment group was not significant for audience-rated performance, $F (1, 16) = .10$, $p = .76$, partial $\eta^2 = .00$, or for audience-rated anxiety, $F (1, 16) = .02$, $p = .88$, partial $\eta^2 = .01$. Finally, the Time X Treatment Group interaction was not

significant for audience-rated performance, $F (1, 16) = 2.05$, $p = .17$, partial $\eta^2 = .11$, or for audience-rated anxiety, $F (1, 16) = 1.82$, $p = .19$, partial $\eta^2 = .10$.

Before moving on it is important to note that the majority of long-term follow-up participants completed the BAT (27/34; 79%); in fact, of the twenty-seven participants who were able to attend the long-term follow-up assessment in person all but one agreed to give a speech (96%). In comparison, sixty-eight percent of long-term follow-up participants (23/34) completed the post-treatment BAT.

3.4   Additional Treatment during Follow-up

Self-reported responses on the *Long-term Follow-up Questionnaire (LTFQ)* indicated that none the long-term follow-up completers had sought additional treatment (therapy) for social phobia during the follow-up period. However, one participant indicated that they had started medication (propranolol) for social phobia during follow-up on the *Long-term Follow-up Medication Interview*.

3.5   Treatment Response/Remission

In addition to examining long-term treatment outcomes via comparisons of group means, we analyzed each participant individually using the treatment *response* and *remission* suggestions set forth by the *Consensus Statement on Social Anxiety (*Ballenger et al., 1998). As previously discussed, *treatment response* was operationalized according to global improvement ratings on the PGI-I; participants who rated themselves as either *very much improved* or *much improved* were considered to have responded to treatment; accordingly, 65% (n = 22) of participants were characterized as treatment *responders* at long-term follow-up with 41% (n = 14) rating themselves as *very much improved* and 24% (n = 8) rating themselves as *much improved*. In comparison, 76% (n = 26) of long-term follow-up completers were characterized as treatment *responders* at post-treatment with 50% (n = 17) rating themselves as *very much improved* and 26% (n = 9) rating themselves as *much improved*. A chi-square analysis indicated no

significant difference in the number of treatment responders at post-treatment versus long-term follow-up χ^2 (1) = 2.09, p = 0.15.

Treatment remission was operationalized via participant self-report ratings on the LSAS-SR using a clinical cutoff score of < 30. Based on LSAS-SR ratings, 47% (n = 16) of participants were considered to be in *remission* at long-term follow-up. In comparison, 32% (n = 11) of long-term follow-up completers were considered to be in remission at post-treatment (as measured by their LSAS-SR ratings). A chi-square analysis indicated that the number of long-term follow-up completers in remission at long-term follow-up was significantly higher than the number in remission at post-treatment χ^2 (1) = 7.34, p = .007 *Treatment remission* was also assessed according to DSM-IV diagnostic criteria (clinician ratings on the SCID); accordingly, 56% (n = 19) participants no longer meet diagnostic criteria for social phobia at long-term follow-up. Of the participants who still met criteria for SP at long term follow-up nine were diagnosed with generalized SP while two were considered to meet criteria for non-generalized SP. Among those who retained a social phobia diagnosis at follow-up, severity ratings ranged from mild (n = 5), to moderate (n = 5), to severe (n = 1).

3.6   Long-term Outcomes of Concurrent Medication

We were unable to examine the impact of medication use on long-term follow-up due to a lack of power. Of the thirty-four long-term follow-up completers, only three reported taking medication for social phobia during treatment and of those three only one had discontinued medication during the follow-up period. According to SCID ratings, the participant that discontinued social phobia medication during follow-up continued to meet diagnostic criteria for severe, non-generalized social phobia at long-term follow-up. Moreover, the participant's long-term follow-up LSAS-SR score (>30) corroborated his/her not being in remission at long-term follow-up. Additional evidence of the participant's lack of treatment response was confirmed by a long-term follow-up global improvement rating of "minimally

improved." Self-report ratings of social phobia and behavioral ratings of anxiety/performance for the participant that discontinued medication during follow-up are presented in Table 8.

To summarize, the findings indicate that participants showed significant improvements at post-treatment which were maintained over the course of the long-term follow-up period, as evidenced by non-significant differences in self-reported and behavioral ratings of social anxiety between the post- and long-term follow-up assessments.

Table 1. Descriptives for primary outcomes at pre, post, and long-term follow-up

Variable		Pre-treatment	Post-treatment	Long-Term Follow-up	N
Self Report Measures					
PRCS					
	VRE	24.06 (3.27)	17.06 (6.06)	17.00 (9.77)	17
	EGT	25.87 (2.79)	9.40 (5.83)	13.13 (7.09)	15
	Total	24.91 (3.15)	13.47 (7.03)	15.19 (8.71)	32
BFNE					
	VRE	38.76 (10.53)	35.71 (8.31)	35.24 (5.91)	17
	EGT	42.21 (8.29)	34.57 (5.88)	34.36 (10.93)	14
	Total	40.32 (9.59)	35.19 (7.22)	34.84 (8.40)	31
LSAS-Fear					
	VRE	24.53 (9.37)	19.96 (7.82)	17.00 (8.85)	17
	EGT	28.27 (10.39)	20.88 (9.57)	18.87 (10.98)	15
	Total	26.28 (9.88)	20.39 (8.55)	17.88 (9.79)	32
LSAS-Avoidance					
	VRE	20.12 (8.49)	15.66 (7.74)	12.76 (8.24)	17
	EGT	27.87 (9.45)	18.67 (10.58)	17.67 (10.59)	15
	Total	23.75 (9.65)	17.07 (9.15)	15.06 (9.58)	32
BAT					
Speaker Anxiety					
	VRE	6.42 (2.75)	5.67 (1.56)	5.83 (3.00)	12
	EGT	7.13 (2.29)	5.00 (2.45)	4.63 (2.67)	8
	Total	6.70 (2.54)	5.40 (1.93)	5.35 (2.87)	20
Speaker Performance					
	VRE	2.92 (2.61)	6.50 (1.17)	4.17 (2.04)	12
	EGT	2.71 (2.14)	6.00 (1.53)	5.14 (.89)	7
	Total	2.84 (2.39)	6.32 (1.29)	4.53 (1.74)	19
Audience Anxiety					
	VRE	--	4.33 (1.41)	4.65 (2.05)	10
	EGT	--	3.50 (1.81)	5.27 (1.99)	8
	Total	--	3.96 (1.61)	4.92 (1.99)	18
Audience Performance					
	VRE	--	6.26 (1.38)	7.25 (1.64)	10
	EGT	--	6.96 (2.43)	6.19 (1.62)	8
	Total	--	6.57 (1.89)	6.78 (1.67)	18

Note. Values in parentheses are standard deviations. BFNE = Fear of Negative Evaluation, Brief Form. PRCS = Personal Report of Confidence as a Speaker. LSAS-Fear = Liebowitz Social Anxiety Scale, Fear subscale. LSAS-Avoidance = Liebowitz Social Anxiety Scale, Avoidance Subscale. VRE = Virtual Reality Exposure. EGT = Exposure Group Therapy.

Table 2. Comparison of pre-treatment scores for LTF completers versus LTF non-completers

	Completers		Non-Completers			
Variable	n	M (SD)	n	M (SD)	t (df)	P
PRCS	33	24.85 (3.11)	40	25.30 (2.55)	.68 (71)	.49
BFNE	33	40.24 (9.30)	42	44.00 (8.75)	1.80 (73)	.08
LSAS-Fear	33	25.88 (9.99)	42	28.55 (12.23)	1.02 (73)	.31
LSAS-Avoidance	33	23.39 (9.71)	42	23.98 (11.50)	.23 (73)	.82

Note. BFNE = Fear of Negative Evaluation, Brief Form. PRCS = Personal Report of Confidence as a Speaker. LSAS-Fear = Liebowitz Social Anxiety Scale, Fear subscale. LSAS-Avoidance = Liebowitz Social Anxiety Scale, Avoidance Subscale.

Table 3. Comparison of mean pre-treatment scores for LTF completers versus LTF non-completers within treatment conditions

Variable	Virtual Reality Exposure				Exposure Group Therapy			
	Completers (n=18)	Non-Completers (n=24)	t (df)	p	Completers (n=15)	Non-Completers (n=18)	t (df)	p
PRCS	24.00 (3.18)	24.92 (2.41)	1.06 (40)	.29	25.87 (2.80)	25.88 (2.73)	.01 (29)	.99
BFNE	38.89 (10.23)	42.71 (9.81)	1.22 (40)	.23	41.87 (8.10)	45.72 (6.98)	1.47 (31)	.15
LSAS-Fear	23.89 (9.49)	26.38 (12.22)	.72 (40)	.48	28.27 (10.39)	31.44 (11.95)	.81 (31)	.43
LSAS-Avoidance	19.67 (8.46)	21.62 (10.07)	.67 (40)	.51	27.87 (9.45)	27.11 (12.79)	-.19 (31)	.85

Note. BFNE = Fear of Negative Evaluation, Brief Form. PRCS = Personal Report of Confidence as a Speaker. LSAS-Fear = Liebowitz Social Anxiety Scale, Fear subscale. LSAS-Avoidance = Liebowitz Social Anxiety Scale, Avoidance Subscale.

Table 4. Comparison of post-treatment scores for LTF completers versus LTF non-completers

Variable	Completers		Non-Completers		t (df)	P
	n	M (SD)	n	M (SD)		
PRCS	32	13.72 (7.26)	40	13.65 (7.35)	- .04 (70)	.97
BFNE	31	35.71 (6.73)	40	36.55 (8.73)	.44 (69)	.66
LSAS-Fear	32	20.64 (8.26)	39	21.08 (13.50)	.16 (69)	.87
LSAS-Avoidance	32	17.51 (8.94)	39	15.52 (13.26)	- .72 (69)	.47

Note. BFNE = Fear of Negative Evaluation, Brief Form. PRCS = Personal Report of Confidence as a Speaker. LSAS-Fear = Liebowitz Social Anxiety Scale, Fear subscale. LSAS-Avoidance = Liebowitz Social Anxiety Scale, Avoidance Subscale.

Table 5. Comparison of mean post-treatment scores for LTF completers versus LTF non-completers within treatment conditions

Note. BFNE = Fear of Negative Evaluation, Brief Form. PRCS = Personal Report of Confidence as a

Variable	Virtual Reality Exposure				Exposure Group Therapy			
	Completers (n=17)	Non-Completers (n=23)	t (df)	p	Completers (n=15)	Non-Completers (n=16)	t (df)	p
PRCS	17.53 (6.28)	15.26 (7.83)	- .98 (38)	.33	9.40 (5.83)	11.47 (6.22)	.97 (30)	.34
BFNE	36.65 (7.40)	37.26 (9.71)	.22 (38)	.83	34.57 (5.88)	35.59 (7.39)	.42 (29)	.68
LSAS-Fear	20.43 (7.20)	22.00 (15.53)	.39 (38)	.70	20.88 (9.57)	19.75 (10.22)	- .32 (29)	.75
LSAS-Avoidance	19.67 (8.46)	21.62 (10.07)	.67 (40)	.51	18.67 (10.58)	13.46 (8.60)	-1.51 (29)	.14

Speaker. LSAS-Fear = Liebowitz Social Anxiety Scale, Fear subscale. LSAS-Avoidance = Liebowitz Social Anxiety Scale, Avoidance Subscale.

Table 6. 3 X 2 (Time X Condition) ANOVA comparing self-report ratings at pre-treatment, post-treatment, and long-term follow-up

Variable	VRE			EGT			Main Effect of Time		Main Effect of Tx		Interaction		Cohen's d		
	Pre	Post	LTF	Pre	Post	LTF	F	p	F	p	F	p	Pre - Post	Pre-LTF	Post - LTF
PRCS	24.06 (3.23)	17.06 (6.06)	17.00 (9.77)	25.87 (2.80)	9.40 (5.83)	13.13 (7.09)	37.85	<.001	4.82	<.05	5.39	<.01	2.10	1.48	0.22
BFNE	38.76 (10.53)	35.71 (8.31)	35.23 (5.91)	42.21 (8.29)	34.57 (5.88)	34.36 (10.93)	8.18	<.01	.04	.848	1.33	.272	0.60	0.61	0.05
LSAS-Fear	24.53 (9.37)	19.96 (7.82)	17.00 (8.85)	28.27 (10.35)	20.88 (9.57)	18.87 (10.98)	20.75	<.001	.53	.471	.56	.540	0.64	0.85	0.27
LSAS-Avoidance	20.12 (8.50)	15.66 (7.74)	12.76 (8.24)	27.87 (9.45)	18.67 (10.58)	17.67 (10.59)	19.70	<.001	3.54	.070	1.32	.274	0.71	0.90	0.22

Note. BFNE = Fear of Negative Evaluation, Brief Form. PRCS = Personal Report of Confidence as a Speaker. LSAS-Fear = Liebowitz Social Anxiety Scale, Fear subscale. LSAS-Avoidance = Liebowitz Social Anxiety Scale, Avoidance Subscale. Values in parenthesis are standard deviations.

Table 7. 3 X 2 (Time X Condition) ANOVA comparing BAT ratings at pre-treatment, post-treatment, and long-term follow-up

Variable	VRE			EGT			Main Effect of Time		Main Effect of Tx		Interaction		Cohen's d		
	Pre	Post	LTF	Pre	Post	LTF	F	p	F	p	F	p	Pre - Post	Pre - LTF	Post - LTF
BAT Anxiety: Audience Rated	--	4.33 (1.41)	4.65 (2.05)	--	3.50 (1.81)	5.27 (1.99)	3.80	.069	.02	.884	1.82	.196	--	--	0.53
BAT Anxiety: Participant Rated	6.42 (2.75)	5.67 (1.56)	5.83 (3.00)	7.13 (2.30)	5.00 (2.45)	4.63 (2.67)	4.22	**<.05**	.18	.675	1.39	.263	0.58	0.50	0.02
BAT Performance: Audience Rated	--	6.26 (1.38)	7.25 (1.64)	--	6.96 (2.43)	6.19 (1.62)	.03	.857	.10	.755	2.05	.171	--	--	0.12
BAT Performance: Participant Rated	2.92 (2.61)	6.50 (1.17)	4.17 (2.04)	2.71 (2.14)	6.00 (1.53)	5.14 (.90)	16.76	**<.001**	.03	.877	.87	.430	1.81	0.81	1.17

Note. Audience ratings were not collected at pre-treatment. Values in parentheses are standard deviations.

4   DISCUSSION

The current study sought to add to the literature by being one of the most methodologically sound long-term follow-ups of CBT for social phobia (SP) to date; being the first to examine long-term outcomes of virtual reality exposure therapy (VRE) in the treatment of SP; using a multimodal approach (self-report, clinician rated, and behavioral) to assess long-term treatment gains; and providing new insight about the long-term implications of psychotropic medication use during treatment for SP.   We were unable to examine our hypothesis that psychotropic medication use would attenuate long-term treatment gains due to a lack of power. Specifically, only one participant who was taking medication for SP during treatment had discontinued their medication at long-term follow-up. We were, however, able to evaluate the extent to which people with social phobia who received one of two forms of short-term CBT fared in the long term. Results showed that participants demonstrated significant improvements several years (M = 5.5 years) after completing treatment, relative to pre-treatment, with no difference between treatment groups on all but one self-report measure (PRCS). Gains made during treatment were maintained during the follow-up period with no significant differences on any measure between the post-treatment assessment and the long-term follow-up assessment, with the exception of participants' BAT performance ratings, which were better at LTF than post-treatment and treatment remission rates . The maintenance of post-treatment gains at long-term follow-up was further corroborated by the small effects that were observed for all self-report measures of social phobia symptomatology (d = .05 $\square$ .27) as well as self-reported anxiety on the BAT (d = .02). Audience ratings on the BAT ranged from small (d = .12; performance) to medium (d = .53; anxiety).

Our primary finding that EGT and VRE treatment gains are well-maintained several years after the completion of treatment is commensurate with previous research on the maintenance of treatment gains following a variety of forms of CBT for social phobia 2-10 years following treatment, including cognitive behavioral group therapy (Heimberg et al., 1993), intensive group cognitive therapy/individual

cognitive therapy (Mortberg et al., 2011), resource-oriented cognitive-behavior therapy/traditional cognitive therapy (Willutzki, Teismann, & Schulte, 2012), internet delivered CBT (Carlbring et al., 2009; Hedman et al., 2011), social effectiveness therapy (Turner et al., 1995), a group behavioral intervention targeting social/interpersonal deficits (Stravynski et al., 2000) , and an "exposure-based homework" protocol (Fava et al., 2001). In addition to maintaining post treatment gains, internet delivered CBT, social effectiveness therapy, and resource oriented/CBT treatment completers are reported to have continued to improve significantly from post-treatment to long-term follow-up (Carlbring et al., 2009; Hedman et al., 2011; Turner et al., 1995; Willutski et al., 2012).

4.1   Strengths and Limitations

The current study is the first to evaluate the long term utility of VRE treatment in a clinical sample of individuals with social phobia. Recall that previous studies have yielded support for the short-term efficacy of VRE in the treatment of a variety of anxiety disorders including social phobia (Anderson et al., 2005; Klinger et al., 2005; Wallach et al., 2009) but very little is known about the extent to which VRE treatment gains are maintained over the long haul. Safir and colleagues (2012) conducted the only long-term follow-up study of a randomized clinical trial testing VRE for social fears— findings from this study, based on participants' self-report ratings, revealed that socially fearful individuals generally maintained their VRE post-treatment gains at one year follow-up (Safir et al., 2012). Consistent with the findings reported by Safir et al. (2012), results from the current study revealed that VRE treatment gains were maintained at long-term follow-up across all measures (self-report, clinician, behavioral). Furthermore, the current study offers several methodological advantages including a much longer follow-up period (1 year versus up to 6.5 years), a clinical sample of individuals with social phobia, and an assessment of behavior. Though further studies and replication are needed, the current findings provide preliminary support for the long-term maintenance of VRE gains several years after the

completion of treatment—this is particularly important considering that VRE could potentially benefit those who do not respond to traditional, in-vivo exposure treatments for SP.

Another important aspect of the current study is that our assessment included a behavioral avoidance task (BAT) – giving a speech. Only one previous long-term follow-up study of social phobia treatment included a BAT (Heimberg et al., 1993). Furthermore, the current study is the first to incorporate a BAT as a part of a long-term follow-up assessment of VRE.   Though rarely utilized in long-term follow-up studies BATs are recommended as a part of evidence-based assessment for anxiety/phobias (Hood & Antony, 2012; Zlomke & Davis, 2008) and are considered to be extremely useful in the assessment of outcomes due to their high sensitivity to change (Craske et al., 1988; McGlynn, 1988). The behavioral data from the current study are promising; the vast majority (79%) of participants completed the speech task at the long-term follow-up. Audience ratings of performance and anxiety indicated that participants maintained post-treatment gains at follow-up. Participants, however, reported that their performance was better at long-term follow-up than post-treatment, although their anxiety was no different at follow-up in comparison to post-treatment. In sum, behavioral data from the current study provide additional evidence to support the long-term utility of VRE and EGT in the treatment of social phobia.

One major challenge that limits the interpretation of data from long-term follow-up studies is receipt of additional treatment during the follow-up period (Chambless & Ollendick, 2001). An important strength of the current study is that all but one of our long-term follow-up participants denied seeking additional treatment between post-treatment and long-term follow-up—this is important because it increases our confidence about the internal validity of the current findings. In contrast, additional treatment during follow-up has been relatively common in previous long-term follow up studies for SP. For internet delivered CBT, rates of participants who report seeking some form of additional help after the completion of treatment range from 11% (at two year follow-up; Carlbring et

al., 2009) to 29% (at five year follow-up; Hedman et al., 2011). Approximately 20% of individuals reported seeking additional treatment after the completion of social effectiveness therapy (Turner et al, 1995). Five out of eighteen participants in Heimberg et al.'s (1993) long-term follow-up of CBGT and EST reported seeking additional treatment. Finally, Mortberg and colleagues (2011) reported that 25% of participants had sought additional treatment after the completion of intensive cognitive therapy or intensive group cognitive therapy. Unfortunately, the reporting of additional treatment in long-term follow-up studies has generally been vague; most studies have not specified the type of additional treatment received or why additional treatment was sought (e.g. for SP or something else). Nevertheless, with the exception of one study (Carlbring et al., 2009), studies that reported on additional treatment conducted additional analyses which all confirmed that participants who sought additional treatment did not differ significantly from those that did not with regards to SP symptomatology at long-term follow-up (Hedman et al., 2011; Heimberg et al., 1993; Mortberg et al., 2011).

Attrition is an issue of common concern in follow-up studies in general, and the current study is no exception, with a response rate of 45% (N = 34). Of the 75 participants who were eligible to participate, 20 could not be contacted (e.g., number disconnected, did not return calls), another 17 agreed to take part in the study but never did (e.g., no-showed for assessment, did not return measures, did not return calls to schedule), and 5 declined participation. The response rate for the current study is comparable to the rate (51%) observed by Heimberg and colleagues (1993) in the only other known in-person, long-term follow-up assessment that included self-report, clinician rated, and behavioral outcome measures. Response rates for other long-term (2+ years after treatment) outcome studies vary widely: interpersonal-focused behavioral group treatment (N = 4; 100%), internet delivered CBT (N = 44; 77%, Carlbring et al., 2009; N = 71; 89% Hedman et al., 2011) intensive cognitive therapy/intensive cognitive group therapy (N = 42; 78%), homework based exposure (N = 45; 64%), social effectiveness

therapy (*N* = 8; 62%), and resource oriented CBT (*N* = 27; 31%). Offering participants the option of completing self-report outcome measures online and/or conducting clinical interviews by phone rather than in-person seems to improve response rates (e.g., Carlbring et al., 2009; Hedman et al., 2011; Mortberg et al., 2011; Willutski et al., 2012), but was not feasible for this study because of the use of a behavioral avoidance test.

Systematic attrition (e.g., participant loss that is not random) can be particularly problematic because it threatens both the internal validity and the external validity of reported findings. For example, Heimberg et al. (1993) reported that their sample of long-term follow-up completers were not fully representative of the treated sample—completers presented to treatment with significantly fewer symptoms of social phobia than non-completers. In the case of Heimberg et al. (1993) selective attrition limited the extent to which the researchers could attribute the reported long-term gains to treatment (internal validity) as well as the extent to which their findings could be generalized to the population (external validity). Selection bias is a related methodological short-coming evident in previous long-term investigations of homework based exposure (Fava et al., 2001) and interpersonal-focused behavioral group treatment (Stravinsky et al., 2000) which excluded individuals who were not in remission at post-treatment. In light of the incidence of selection bias and systematic attrition in the long-term follow-up literature additional research is needed to solidify our understanding and confidence regarding the long-term efficacy of SP treatment interventions as a whole. Fortunately, our analyses of follow-up completers versus non-completers did not reveal significant pre-treatment or post-treatment differences in terms of symptom severity; thus, although attrition in the current study is notable these findings suggest that our sample of follow-up completers was representative of the treated sample and provide support for the validity of our findings.

Before moving forward, it is important to discuss some additional external validity issues that are particularly relevant to the current study. First, the inclusion criteria for the two parent studies

specified that fear of public speaking must be the primary social fear--some have argued that public speaking anxiety may be a specific subtype of social anxiety disorder with manifestations that are not necessarily consistent with generalized social anxiety (Blöte, Kint, Miers, & Westenberg, 2009). Also, the co-morbidity in the current sample (12%) is lower than what is typically found for individuals with social anxiety disorder, although it is comparable to comorbidity reported in other research utilizing internet-based or virtual reality for public speaking fears (7% - 12.5%; Andersson et al., 2006; Botella et al., 2008). Finally, although the ethnic/racial diversity in the current sample represents the diverse community in which the study was conducted, such populations are underrepresented in treatment efficacy research (Whaley & Davis, 2007), including virtual reality exposure therapy.

4.2   Future Directions

While results from the current study and previous studies offer consistent support for the long-term maintenance of CBT in the treatment of social phobia, much of the current characterized by statistically significant changes based on clinician and self-reported ratings of social phobia-- the extent to which these statistically significant changes amount to clinically significant changes is not yet clear. In an effort to further elucidate the relation between statistically significant and clinically significant change, future long-term follow-up studies should regularly incorporate multimodal assessment techniques including self-report, clinician rated, physiological, and behavioral measures of social anxiety. Previous researchers have suggested that behavioral assessments, like the BAT used in the current study, are an important part of treatment outcome research because they provide an assessment of clinically significant change in "real world" functioning (Kazdin, 1999; Norton & Hope, 2001; Bunnell, Beidel, & Mesa, 2013). Furthermore, behavioral assessments are thought to offer unique clinical insight by providing clinicians with the opportunity to observe and assess avoidance and/or safety behaviors as well as social skills and performance.

Another important area of future research will be to identify and examine predictors of long-term treatment success for SP. One study to date has reported on predictors of long-term outcome; findings from Fava and colleagues (2001) identified the following predictors of relapse 1) the presence of a comorbid personality disorder, 2) residual symptoms of SP after the completion of treatment, and 3) failure to completely withdraw from benzodiazepines during exposure treatment. The finding that failure to withdrawal from benzodiazepines during exposure treatment is in line with our hypothesis that medication use during CBT for SP may attenuate long-term treatment gains and further highlights the need for additional research in this area.

4.3   Conclusions

In summary, the current study examined the long-term efficacy of cognitive behavioral therapy for social phobia. Results supported the long-term maintenance of gains made following individual (VRE) and group (EGT) treatment and are consistent with previous literature which has generally supported the long-term efficacy of CBT in the treatment of social phobia. Primary contributions of the current study include: being the first to examine long-term outcomes of VRE in a clinical sample of individuals with social phobia and by incorporating a multimodal assessment approach, including a behavioral avoidance task, at long-term follow-up which has only been done once before (Heimberg et al., 1993). To conclude, the current findings are important because they suggest that exposure in the virtual world or *in vivo* may be followed by long-lasting behavioral changes in the real world.

REFERENCES

Abbott, M. J., & Rapee, R. M. (2004). Post-event rumination and negative self-appraisal in social

phobia before and after treatment. *Journal of Abnormal Psychology*, *113*(1), 136–144.

doi:10.1037/0021-843X.113.1.136

Acarturk, C., Cuijpers, P., van Straten, A., & de Graaf, R. (2009). Psychological treatment of social

anxiety disorder: a meta-analysis. *Psychological Medicine*, *39*(02), 241–254.

doi:10.1017/S00332917080 03590

Altman, D. G., Schulz, K. F., Moher, D., Egger, M., Davidoff, F., Elbourne, D., . . . Lang, T. (2001). The

revised CONSORT statement for reporting randomized trials: Explanation and elaboration.

Annals of Internal Medicine, 134(8), 663-694. doi: 10.7326/0003-4819-134-8-200104170-00012

Anderson, P., Jacobs, C. H., Lindner, G. K., Edwards, S., Zimand, E., Hodges, L., & Rothbaum, B.

O. (2006). Cognitive behavior therapy for fear of flying: Sustainability of treatment gains after

September 11. *Behavior Therapy*, *37*(1), 91–97. doi:10.1016/j.beth.2005.05.001

Anderson, P. L., Zimand, E., Hodges, L. F., & Rothbaum, B. O. (2005). Cognitive behavioral therapy for

public-speaking anxiety using virtual reality for exposure. *Depression and Anxiety*, *22*(3), 156–

158. doi:10.1002/da.20090

Andersson, G., Carlbring, P., Holmström, A., Sparthan, E., Furmark, T., Nilsson-Ihrfelt, et al. (2006).

Internet-based self-help with therapist feedback and in vivo group exposure for social phobia:

A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *74*, 677– 686. doi:

10.1037/0022-006X.74.4.677

Antony, M. M., & Barlow, D. H. (1997). Social and specific phobia. In A. Tasman, J. Kay, & J.Lieberman

(Eds.), *Psychiatry* (pp. 1037-1059). Philadelphia, PA: WB Saunders Company.

Antony, M.M., Orsillo, S.M., & Roemer, L. (2001). *Practitioner's guide to empirically based measures

of anxiety*. Boston, MA: Kluwer Academic.

APA (2000). *Diagnostic and statistical manual of mental disorders, Fourth Edition – Text Revision (4ᵗʰ ed.)*: American Psychiatric Publishing, Inc.

Baldwin, D., Bobes, J., Stein, D. J., Scharw√§chter, I., & Faure, M. (1999). Paroxetine in social phobia/social anxiety disorder. Randomised, double-blind, placebo-controlled study. Paroxetine Study Group. *The British Journal of Psychiatry*, *175*(2), 120–126. doi:10.1192/bjp.175.2.120

Barlow, D. H. (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic (2nd ed.).* Guilford Press.

Beck, J. S. (1995). *Cognitive therapy: Basics and beyond.* New York: Guilford.

Beidel, D. C., Turner, S. M., Jacob, R. G., & Cooley, M. R. (1989). Assessment of social phobia: Reliability of an impromptu speech task. *Journal of Anxiety Disorders*, *3*, 149–158. doi:10.1016/0887-6185(89)90009-1

Blomhoff, S., Haug, T. T., Hellström, K., Holme, I., Humble, M., Madsbu, H. P., & Wold, J. E. (2001). Randomised controlled general practice trial of sertraline, exposure therapy and combined treatment in generalised social phobia. *The British Journal of Psychiatry*, *179*(1), 23–30. doi:10.1192/bjp.179.1.23

Blöte, A. W., Kint, M.J.W., Miers, A.C., & Westenberg, P.M. (2009). The relation between public speaking anxiety and social anxiety: A review. *Journal of Anxiety Disorders, 23,* 305-313. doi: 10.1016/j.janxdis.2008.11.007.

Botella, C., García-Palacios, A., Villa, H., Baños, R. M., Quero, S., Alcañiz, M., & Riva, G. (2007). Virtual reality exposure in the treatment of panic disorder and agoraphobia: A controlled study. *Clinical Psychology & Psychotherapy*, *14*, 164–175. doi:10.1002/cpp.524

Botella, C., Gallego, M. J., Garcia-Palacios, A., Baños, R. M., Quero, S., & Guillen, V. (2008). An

Internet-based self-help program for the treatment of fear of public speaking: A case study. *Journal of Technology in Human Services*, *26*, 182– 202. doi: 10.1080/15228830802094775

Bunnell, B. E., Beidel, D. C., & Mesa, F. (2013). A randomized trial of attention training for generalized social phobia: Does attention training change social behavior? *Behavior Therapy*. doi:10.1016/j. beth.2013.04.010.

Carlbring, P., Nordgren, L. B., Furmark, T., & Andersson, G. (2009). Long-term outcome of internet-delivered cognitive-behavioural therapy for social phobia: A 30-month follow-up. *Behaviour Research and Therapy*, *47*(10), 848–850. doi:10.1016/j.brat.2009.06.012

Chambless, D. L., & Ollendick, T. H. (2001). Empirically supported psychological interventions: Controversies and evidence. *Annual Review of Psychology*, *52*(1), 685–716. doi:10.1146/ annurev.psych.52.1.685

Chartier, M. J., Walker, J. R., & Stein, M. B. (2001). Social phobia and potential childhood risk factors in a community sample. *Psychological Medicine*, *31*(02), 307–315. doi:10.1017/ S0033291701003348

Clark, D. M. (2001). A cognitive perspective on social phobia. In W.R. Crozier, L.E. Alden (Eds.), *International handbook of social anxiety: Concepts, research and interventions relating to the self and shyness (pp.* 405–430). Chichester, UK: Wiley.

Clark, D. M., Ehlers, A., McManus, F., Hackmann, A., Fennell, M., Campbell, H., & Louis, B. (2003a). Cognitive therapy versus fluoxetine in generalized social phobia: A randomized placebo-controlled trial. *Journal of Consulting and Clinical Psychology*, *71*(6), 1058–1067. doi:10.1037/0022-006X.71.6.1058

Clark, D.M. & Wells, A. (1995) A cognitive model of social phobia*.* In Heimberg, M. R. Liebowitz, D. Hope, et al (Eds.), *Social Phobia – Diagnosis, assessment, and treatment* (pp. 69–93). New

York: Guilford.

Coles, M. E., Turk, C. L., & Heimberg, R. G. (2002). The role of memory perspective in social phobia: Immediate and delayed memories for role-played situations. *Behavioural and Cognitive Psychotherapy*, *30*(04), 415–425. doi:10.1017/S1352465802004034

Collins, K. A., Westra, H. A., Dozois, D. J. A., & Stewart, S. H. (2005). The validity of the brief version of the Fear of Negative Evaluation Scale. *Journal of Anxiety Disorders*, *19*, 345–359. doi:10.1016/j.janxdis.2004.02.003

Craske, M.G., Rapee, R.M., & Barlow, D.H. (1988). The significance of panic-expectancy for individual patterns of avoidance*. Behavior Therapy*, 19, 577-592. doi: 10.1016/S0005-7894(88)80025-X

Davidson, J.T., Foa, E.B., Huppert, J.D., & et al. (2004). Fluoxetine, comprehensive cognitive behavioral therapy, and placebo in generalized social phobia. *Archives of General Psychiatry*, *61*(10), 1005–1013. doi:10.1001/archpsyc.61.10.1005

Des Jarlais, D. C., Lyles, C., & Crepaz, N. (2004). Improving the reporting quality of nonrandomized evaluations of behavioral and public health interventions: The TREND statement. *American Journal of Public Health, 94*(3), 361-366. doi: 10.2105/ajph.94.3.361

DeWit, D. J., Ogborne, A., Offord, D. R., & MacDonald, K. (1999). Antecedents of the risk of recovery from DSM-III-R social phobia. *Psychological Medicine*, *29*(03), 569–582.

DiNardo, P. A. & Barlow, D. H. (1988). Anxiety Disorders Interview Schedule–Revised (ADIS—R). Albany: Phobia and Anxiety Disorders Clinic, State University of New York

Fava, G. A., Grandi, S., & Canestrari, R. (1989). Treatment of social phobia by homework exposure. *Psychotherapy and Psychosomatics*, *52*(4), 209–213. doi:10.1159/000288326

Fava, G. A., Grandi, S., Rafanelli, C., Ruini, C., Conti, S., & Belluardo, P. (2001). Long-term outcome of social phobia treated by exposure. *Psychological Medicine*, *31*(05), 899–905. doi:10.1017/S0033291701004020

First, M. B., Gibbon, M., Spitzer, R. L., & Williams, J. B. W. (2002). *Structured clinical interview for the DSM-IV-TR axis 1 disorders*. New York: Biometrics Research Department.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1994). *Structured clinical interview for Axis I DSM–IV Disorders—Research Edition*. New York, NY: Biometrics Research Department.

Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin*, *99*(1), 20–35. doi:10.1037/0033-2909.99.1.20

Fresco, D. M., Coles, M. E., Heimberg, R. G., Liebowitz, M. R., Hami, S., Stein, M. B., & Goetz, D. (2001). The Liebowitz Social Anxiety Scale: A comparison of the psychometric properties of self-report and clinician-administered formats. *Psychological Medicine*, *31*, 1025– 1035. doi: 10.1017/S0033291701004056

Furmark, T., Tillfors, M., Stattin, H., Ekselius, L., & Fredrikson, M. (2000). Social phobia subtypes in the general population revealed by cluster analysis. *Psychological Medicine*, *30*(06), 1335– 1344.

Guy, W. (1976) *ECDEU Assessment Manual for Psychotherapy – Revised* (DHEW Publication No. ADM 76-338). Bethesda, MD: National Institute of Mental Health.

H, O. (1939). A stimulus-response analysis of anxiety and its role as a reinforcing agent. *Psychological Review*, *46*(6), 553–565. doi:10.1037/h0054288

Hansen, R. A., Gaynes, B. N., Gartlehner, G., Moore, C. G., Tiwari, R., & Lohr, K. N. (2008). Efficacy and tolerability of second-generation antidepressants in social anxiety disorder. *International Clinical Psychopharmacology*, *23*(3), 170–179. doi:10.1097/YIC.0b013e3282f4224a

Haug, T. T., Blomhoff, S., Hellstrøm, K., Holme, I., Humble, M., Madsbu, H. P., & Wold, J. E. (2003). Exposure therapy and sertraline in social phobia: I-year follow-up of a randomised controlled trial. *The British Journal of Psychiatry*, *182*(4), 312–318. doi:10.1192/bjp.02.229

Hedman, E., Andersson, G., Ljotsson, B., Andersson, E., Ruck, C., Mortberg, E., & Lindefors, N. (2011).

Internet-Based cognitive behavior therapy vs. cognitive behavioral group therapy for social anxiety disorder: A randomized controlled non-inferiority trial. *PLoS ONE*, *6*(3). doi:10.1371/journal.pone.0018001

Hedman, E., Furmark, T., Carlbring, P., Ljotsson, B., Ruck, C., Lindefors, N., & Andersson, G. (2011). A 5-Year Follow-up of Internet-Based Cognitive Behavior Therapy for Social Anxiety Disorder. *Journal of Medical Internet Research*, *13*(2). doi:10.2196/jmir.1776

Heimberg, R. G. (1989). Cognitive and behavioral treatments for social phobia: A critical analysis. *Clinical Psychology Review*, *9*(1), 107–128. doi:10.1016/0272-7358(89)90050-0

Heimberg, R. G. (2002). Cognitive-behavioral therapy for social anxiety disorder: current status and future directions. *Biological Psychiatry*, *51*(1), 101–108. doi:10.1016/S0006-3223(01)01183-0

Heimberg, R.G., Brozovich, F.A., & Rapee, R.M. A cognitive-behavioral model of social anxiety disorder: Update and extension. In: Hofmann SG, DiBartolo PM (Eds.) Social anxiety: Clinical, developmental, and social perspectives. 2nd edition (pp.395-422).Elsevier; New York: 2010.

Heimberg, R. G., Dodge, C. S., Hope, D. A., Kennedy, C. R., Zollo, L. J., & Becker, R. E. (1990). Cognitive behavioral group treatment for social phobia: Comparison with a credible placebo control. *Cognitive Therapy and Research*, *14*(1), 1–23. doi:10.1007/BF01173521

Heimberg, R. G., Horner, K. J., Juster, H. R., Safren, S. A., Brown, E. J., Schneier, F. R., & Liebowitz, M. R. (1999). Psychometric properties of the Liebowitz Social Anxiety Scale. *Psychological Medicine*, *29*(01), 199–212.

Heimberg, R.G. & Juster, H.P. (1995). Cognitive-behavioral treatments: Literature review. In R.G. Heimberg, M.R. Lieborwitz, D.A. Hope & F.R. Schneier (Eds.) *Social phobia: Diagnosis, assessment and treatment*. New York: Guilford Press.

Heimberg RG, Liebowitz MR, Hope DA, & et al. (1998). Cognitive behavioral group therapy vs phenelzine

therapy for social phobia: 12-week outcome. *Archives of General Psychiatry*, *55*(12), 1133–1141.

doi:10.1001/archpsyc.55.12.1133

Heimberg, R. G., Salzman, D. G., Holt, C. S., & Blendell, K. A. (1993). Cognitive—behavioral group

treatment for social phobia: Effectiveness at five-year followup. *Cognitive Therapy and*

Research, *17*(4), 325–339. doi:10.1007/BF01177658

Herbert, J. D., Gaudiano, B. A., Rheingold, A. A., Myers, V. H., Dalrymple, K., & Nolan, E. M. (2005). Social

skills training augments the effectiveness of cognitive behavioral group therapy for social

anxiety disorder. *Behavior Therapy*, *36*(2), 125–138. doi:10.1016/S0005-7894(05)80061-9

Hofmann, S. G. (2002). *Exposure Group Therapy Treatment Manual*. Unpublished manuscript.

Hofmann, S. G., Albano, A. M., Heimberg, R. G., Tracey, S., Chorpita, B. F., & Barlow, D. H. (1999).

Subtypes of social phobia in adolescents. *Depression and Anxiety*, *9*(1), 15–18. doi:10.1002/

(SICI)1520-6394(1999)9:1<15::AID-DA2>3.0.CO;2-6

Kazdin, A.E. (1999). Overview of research design issues in clinical psychology. In P.C. Kendall, J. N.

Butcher, & G. N. Holmbeck (Eds.) *Handbook of research methods in clinical psychology* (2nd ed.,

pp. 3-30). New York: John Wiley & Sons.

Keller, M. B. (2003). The lifelong course of social anxiety disorder: a clinical perspective. *Acta*

Psychiatrica Scandinavica, *108*, 85–94. doi:10.1034/j.1600-0447.108.s417.6.x

Kellner, R. (1972). Part 2. Improvement criteria in drug trials with neurotic patients. *Psychological*

Medicine, *2*(01), 73–80. doi:10.1017/S0033291700045645

Kessler, R. C., Stein, M. B., & Berglund, P. (1998). Social phobia subtypes in the national comorbidity

survey. *American Journal of Psychiatry*, *155*(5), 613–619.

Kessler R.C., Chiu, W., Demler, O., & Walters, E.E. (2005). Prevalence, severity, and comorbidity of 12-

month dsm-iv disorders in the national comorbidity survey replication. *Archives of General*

Psychiatry, *62*(6), 617–627. doi:10.1001/archpsyc.62.6.617

Kocovski, N. L., & Rector, N. A. (2008). Post-Event Processing in Social Anxiety Disorder: Idiosyncratic

Priming in the Course of CBT. *Cognitive Therapy and Research*, *32*(1), 23–36. doi:10.1007/

s10608-007-9152-z

Klinger, E., Bouchard, S., Légeron, P., Roy, S., Lauer, F., Chemin, I., & Nugues, P. (2005). Virtual

reality therapy versus cognitive behavior therapy for social phobia: A preliminary controlled

study. *CyberPsychology & Behavior*, *8*, 76–88. doi:10.1089/cpb.2005.8.76

Klorman, R., Weerts, T. C., Hastings, J. E., Melamed, B. G., & Lang, P. J. (1974). Psychometric description

of some specific-fear questionnaires. *Behavior Therapy*, *5*, 401–409. doi:10.1016/S0005-

7894(74)80008-0

Leary, M. R. (1983). A brief version of the Fear of Negative Evaluation Scale. *Personality and Social

Psychology Bulletin*, *9*, 371– 375. doi: 10.1177/0146167283093007

Liebowitz, M. R. (1987). Social phobia. *Modern Problems of Pharmacopsychiatry*, *22*, 141–173.

Liebowitz, M. R. (1999). Update on the diagnosis and treatment of social anxiety disorder. *The

Journal of Clinical Psychiatry*, *60 Suppl 18*, 22–26.

Liebowitz, M. R., Heimberg, R. G., Schneier, F. R., Hope, D. A., Davies, S., Holt, C. S., Klein, D. F. (1999).

Cognitive-behavioral group therapy versus phenelzine in social phobia: Long term outcome.

Depression and Anxiety, *10*(3), 89–98. doi:10.1002/(SICI)1520-6394(1999)10:3<89::AID-

DA1>3.0.CO;2-5

Liebowitz, M. R., Schneier, F., Campeas, R., Hollander, E., Hatterer, J., Fyer, A., Gully, R. (1992).

Phenelzine vs atenolol in social phobia. A placebo-controlled comparison. *Archives of General

Psychiatry*, *49*(4), 290–300.

Lombardo, T. W. (1988). Personal Report of Confidence as a Speaker. In: M. Herson & A. S. Bellack (Eds.),

Dictionary of behavioral assessment techniques. (pp. 347-348). Pergamon Press, New York.

Magee, W.J., Eaton, W.W., Wittchen, H., McGonagle, K.A., & Kessler, R.C. (1996). Agoraphobia, simple

phobia, and social phobia in the national comorbidity survey. *Archives of General Psychiatry*,

    53(2), 159–168. doi:10.1001/archpsyc.1996.01830020077009

Marks, I.M., & O'Sullivan, G. (1988). Drugs and psychological treatments for agoraphobia/panic

    and obsessive-compulsive disorders: a review. *The British Journal of Psychiatry*, *153*(5), 650–658.

    doi:10.1192/bjp.153.5.650

Marks, I. M., Swinson, R. P., Ba≈üoƒülu, M., Kuch, K., Noshirvani, H., O'Sullivan, G., & Sengun, S. (1993).

    Alprazolam and exposure alone and combined in panic disorder with agoraphobia. A controlled

    study in London and Toronto. *The British Journal of Psychiatry*, *162*(6), 776–787. doi:10.1192/

    bjp.162.6.776

Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny

    fear and social interaction anxiety. *Behaviour Research and Therapy*, *36*(4), 455–470.

    doi:10.1016/S0005-7967(97)10031-6

McCabe, R.E. & Antony, M.M. (2008). Social and Specific Phobias. In A. Tasman, J. Kay, J.A. Lieberman,

    M.B. First, and M. Maj (Eds.), *Psychiatry Third Edition (pp)*. London, England: John Wiley & Sons,

    Ltd.

McGlynn, F.D. (1988). Behavioral Avoidance Test. In M. Hersen, & A.S. Bellack (Eds.), *Dictionary of*

    behavioral assessment techniques (pp.59-60). New York: Pergamon

Morissette, S. B., Spiegel, D. A., & Barlow, D. H. (2008). Combining exposure and pharmacotherapy in

    the treatment of social anxiety disorder: A preliminary study of state dependent learning.

    Journal of Psychopathology and Behavioral Assessment, *30*(3), 211–219. doi:10.1007/s10862-

    007-9061-1

Mörtberg, E., Clark, D. M., & Bejerot, S. (2011). Intensive group cognitive therapy and individual

    cognitive therapy for social phobia: Sustained improvement at 5-year follow-up. *Journal of*

    Anxiety Disorders, *25*(8), 994–1000. doi:10.1016/j.janxdis.2011.06.007

Mörtberg, E., Clark, D. M., Sundin, Ö., & Åberg Wistedt, A. (2007). Intensive group cognitive treatment
and individual cognitive therapy vs. treatment as usual in social phobia: A randomized controlled
trial. *Acta Psychiatrica Scandinavica*, *115*(2), 142–154. doi:10.1111/j.1600-0447.2006.00839.x

Moscovitch, D. A., Antony, M. M., Swinson, R. P., & Stein, M. B. (2009). Exposure-based treatments for
anxiety disorders: Theory and process *Oxford handbook of anxiety and related disorders.* (pp.
461-475). New York, NY US: Oxford University Press.

Mowrer O.H. (1960). Learning theory and the symbolic processes. New York: Wiley.

Norton, P. J. & Hope, D. A. (2001). Analogue observational methods in the assessment of social
functioning in adults. *Psychological Assessment, 13,* 59-72.DOI: 10.1037//1040-3590.13.1.59

Otto, M. W., & Safren, S. A. (2001). Mechanisms of action in the treatment of social phobia. In S. G.
Hofmann & P. M. DiBartolo (Eds.), *From social anxiety to social phobia: Multiple perspectives*
(pp. 391-407). Needham Heights, MA, US: Allyn & Bacon.

Otto, M. W., Smits, J. A. J., & Reese, H. E. (2005). Combined psychotherapy and pharmacotherapy for
mood and anxiety disorders in adults: Review and analysis. *Clinical Psychology: Science and
Practice*, *12*, 72–86. doi:10.1093/clipsy.bpi009

Overton, D. A. (1991). Historical context of state dependent learning and discriminative drug effects.
Behavioural Pharmacology, *2*(4 And 5), 253–264.

Paul, G. L. (1966). *Insight vs desensitization in psychotherapy*. Standford, CA: Stanford University Press.

Perini, S. J., Abbott, M. J., & Rapee, R. M. (2006). Perception of performance as a mediator in the
relationship between social anxiety and negative post-event rumination. *Cognitive Therapy and
Research*, *30*(5), 645–659. doi:10.1007/s10608-006-9023-z

Pavlov, I.P. (1927). *Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral
Cortex.* London: Oxford University Press.

Prasko, J., Dockery, C., Horácek, J., Houbová, P., Kosová, J., Klaschka, J., & Höschl, C. (2006).

Moclobemide and cognitive behavioral therapy in the treatment of social phobia. A six-month controlled study and 24 months follow up. *Neuro Endocrinology Letters*, *27*(4), 473–481.

Rachman, S. (1976). The passing of the two-stage theory of fear and avoidance: Fresh possibilities. *Behaviour Research and Therapy*, *14*(2), 125–131. doi:10.1016/0005-7967(76)90066-8

Rachman, S., Grüter-Andrew, J., & Shafran, R. (2000). Post-event processing in social anxiety. *Behaviour Research and Therapy*, *38*(6), 611–617. doi:10.1016/S0005-7967(99)00089-3

Rapee, R. M., & Heimberg, R. G. (1997). A cognitive-behavioral model of anxiety in social phobia. *Behaviour Research and Therapy*, *35*(8), 741–756. doi:10.1016/S0005-7967(97)00022-3

Rescorla, R.A. & Wagner, A.R. (1972). A theory of Pavlovian conditioning. Variations in effectiveness of reinforcement and non-reinforcement. In A. Black & W.F. Prokasky, Jr. (eds.), *Classical Conditioning II* New York: Appleton-Century-Crofts.

Riskind JH, Beck AT, Berchick RJ, Brown G, & Steer RA. (1987). Reliability of DSM-III diagnoses for major depression and generalized anxiety disorder using the structured clinical interview for DSM-III. *Archives of General Psychiatry*, *44*(9), 817–820. doi:10.1001/archpsyc.1987.01800210065010

Rodebaugh, T. L., Holaway, R. M., & Heimberg, R. G. (2004). The treatment of social anxiety disorder. *Clinical Psychology Review*, *24*(7), 883–908. doi:10.1016/j.cpr.2004.07.007

Rothbaum, B. O., Anderson, P., Zimand, E., Hodges, L., Lang, D., & Wilson, J. (2006). Virtual reality exposure therapy and standard (in Vivo) exposure therapy in the treatment of fear of flying. *Behavior Therapy*, *37*(1), 80–90. doi:10.1016/j.beth.2005.04.004

Rothbaum, B. O., Hodges, L., Anderson, P. L., Price, L., & Smith, S. (2002). Twelve-month follow-up of virtual reality and standard exposure therapies for the fear of flying. *Journal of Consulting and Clinical Psychology*, *70*(2), 428–432. doi:10.1037/0022-006X.70.2.428

Rothbaum, B. O., Hodges, L., Smith, S., Lee, J. H., & Price, L. (2000). A controlled study of virtual reality

exposure therapy for the fear of flying. *Journal of Consulting and Clinical Psychology*, *68*, 1020–1026. doi:10.1037/0022-006X.68.6.1020

Safir, M. P., Wallach, H. S., & Bar-Zvi, M. (2012). Virtual reality cognitive behavior therapy for public speaking anxiety one-year follow-up. *Behavior Modification*, *36*, 235– 246. doi: 10.1177/0145445511429999

Shear, M. K., Greeno, C., Kang, J., Ludewig, D., Frank, E., Swartz, H. A., & Hanekamp, M. (2000). Diagnosis of nonpsychotic patients in community clinics. *American Journal of Psychiatry*, *157*(4), 581–587. doi:10.1176/appi.ajp.157.4.581

Skinner, B.F. (1938). *The Behavior of Organisms: An Experimental Analysis.* Cambridge, Massachusetts: B.F. Skinner Foundation.

Stein, M. B., Fyer, A. J., Davidson, J. R. T., Pollack, M. H., & Wiita, B. (1999). Fluvoxamine treatment of social phobia (social anxiety disorder): A double-blind, placebo-controlled study. *American Journal of Psychiatry*, *156*(5), 756–760.

Stein, M. B., & Kean, Y. M. (2000). Disability and quality of life in social phobia: Epidemiologic findings. *American Journal of Psychiatry*, *157*(10), 1606–1613. doi:10.1176/appi.ajp.157.10.1606

Stein MB, Walker JR, & Forde DR. (1996). Public-speaking fears in a community sample: Prevalence, impact on functioning, and diagnostic classification. *Archives of General Psychiatry*, *53*(2), 169–174. doi:10.1001/archpsyc.1996.01830020087010

Stemberger, R. T., Turner, S. M., Beidel, D. C., & Calhoun, K. S. (1995). Social phobia: An analysis of possible developmental factors. *Journal of Abnormal Psychology*, *104*(3), 526–531.

Stravynski, A., Arbel, N., Bounader, J., Gaudette, G., Lachance, L., Borgeat, F., & Todorov, C. (2000). Social phobia treated as a problem in social functioning: a controlled comparison of two behavioural group approaches. *Acta Psychiatrica Scandinavica*, *102*(3), 188–198. doi:10.1034/ j.1600-0447.2000.102003188.x

Thompson, R. F., & Spencer, W. A. (1966). Habituation: A model phenomenon for the study of neuronal substrates of behavior. *Psychological Review*, *73*(1), 16–43. doi:10.1037/h0022681

Tryon, W. W. (2005). Possible mechanisms for why desensitization and exposure therapy work. *Clinical Psychology Review*, *25*(1), 67–95. doi:10.1016/j.cpr.2004.08.005

Turner, S. M., Beidel, D. C., & Cooley-Quille, M. R. (1995). Two-year follow-up of social phobics treated with Social Effectiveness Therapy. *Behaviour Research and Therapy*, *33*(5), 553–555. doi:10.1016/0005-7967(94)00086-Y

Turner, S. M., Beidel, D. C., Wolff, P. L., Spaulding, S., & Jacob, R. G. (1996). Clinical features affecting treatment outcome in social phobia. *Behaviour Research and Therapy*, *34*(10), 795–804. doi:10.1016/0005-7967(96)00028-9

Turner, S. M., Cooley-Quille, M. R., & Beidel, D.C. (1996). *Behavioral and pharmacological treatment for social phobia.* In M. R. Mavissakalian, and R. F. Prien (Eds.), Long-term treatments of anxiety disorders. Washington, DC: American Psychiatric Press.

Vaiva, G., Ducrocq, F., Jezequel, K., Averland, B., Lestavel, P., Brunet, A., & Marmar, C. R. (2003). Immediate treatment with propranolol decreases posttraumatic stress disorder two months after trauma. *Biological Psychiatry*, *54*(9), 947–949. doi:10.1016/S0006-3223(03)00412-8

Van Ameringen, M. A., Lane, R. M., Walker, J. R., Bowen, R. C., Chokka, P. R., Goldner, E. M., & Swinson, R. P. (2001). Sertraline treatment of generalized social phobia: A 20-Week, double-blind, placebo-controlled Study. *American Journal of Psychiatry*, *158*(2), 275–281. doi:10.1176/appi.ajp.158.2.275

Wallach, H. S., Safir, M. P., & Bar-Zvi, M. (2009). Virtual reality cognitive behavior therapy for public speaking anxiety. *Behavior Modification*, *33*, 314 –338. doi:10.1177/0145445509331926

Watson, D., & Friend, R. (1969). Measurement of social-evaluative anxiety. *Journal of Consulting and Clinical Psychology*, *33*(4), 448–457. doi:10.1037/h0027806

Weeks, J. W., Heimberg, R. G., Fresco, D. M., Hart, T. A., Turk, C. L., Schneier, F. R., & Liebowitz, M. R.

    (2005). Empirical validation and psychometric evaluation of the brief fear of negative evaluation

    scale in patients with social anxiety disorder. *Psychological Assessment*, *17*(2), 179–190.

    doi:10.1037/1040-3590.17.2.179

Wells, A., & Papageorgiou, C. (2001). Brief cognitive therapy for social phobia: a case series. *Behaviour*

    Research and Therapy, *39*(6), 713–720. doi:10.1016/S0005-7967(00)00036-X

Wiederhold, B. K., & Wiederhold, M. D. (2003). Three-Year Follow-Up for Virtual Reality Exposure for

    Fear of Flying. *CyberPsychology & Behavior*, *6*(4), 441–445. doi:10.1089/109493103322278844

Wilhelm, F. H., & Roth, W. T. (1997). Acute and delayed effects of alprazolam on flight phobics during

    exposure. *Behaviour Research and Therapy*, *35*(9), 831–841.doi:10.1016/S0005-7967

    (97)00033-8

Williams, D. R., Takeuchi, D. T., & Adair, R. K. (1992). Socioeconomic status and psychiatric disorder

    among blacks and whites. *Social Forces*, *71*(1), 179–194. doi:10.1093/sf/71.1.179

Willutzki, U., Teismann, T., & Schulte, D. (2012). Psychotherapy for social anxiety disorder: Long-term

    effectiveness of resource-oriented cognitive-behavioral therapy and cognitive therapy in

    social anxiety disorder. *Journal of Clinical Psychology*, *68*(6), 581–591. doi:10.1002/jclp.21842

APPENDICES

Appendix A.

PRCS

This instrument is composed of 30 items regarding your feelings of confidence as a speaker. Try to decide whether "true" or "false" most represents your feelings associated with your most recent speech. Then write "T" or "F" next to each question to indicate your answer. Work quickly and don't spend much time on any one question. We want your first impression on this questionnaire.

1. I look forward to an opportunity to speak in public. _____

2. My hands tremble when I try to handle objects on the platform. ____

3. I am in constant fear of forgetting my speech. _____

4. Audiences seem friendly when I address them. _____

5. While preparing a speech I am in a constant state of anxiety. _____

6. At the conclusion of a speech I feel that I have had a pleasant experience. _____

7. I dislike to use my body and voice expressively. _____

8. My thoughts become confused and jumbled when I speak before an audience. _____

9. I have no fear of facing an audience. _____

10. Although I am nervous just before getting up I soon forget my fears and enjoy the experience. ____

11. I face the prospect of making a speech with complete confidence. _____

12. I feel that I am in complete possession of myself while speaking. _____

13. I prefer to have notes on the platform in case I forget my speech. _____

14. I like to observe the reactions of my audience to my speech. _____

15. Although I talk fluently with friends I am at a loss for words on the platform. ____

16. I feel relaxed and comfortable while speaking. _____

17. Although I do not enjoy speaking in public I don't particularly dread it. _____

18. I always avoid speaking in public if possible. ____

19. The faces of my audience are blurred when I look at them. _____

20. I enjoy preparing a talk. _____

21. My mind is clear when I face an audience. _____

22. I am fairly fluent. _____

23. I perspire and tremble just before getting up to speak. _____

24. My posture feels strained and unnatural. _____

25. I am fearful and tense all the while I am speaking before a group of people. _____

26. I find the prospect of speaking mildly unpleasant. _____

27. It is difficult for me to calmly search my mind for the right words to express my thoughts. _____

28. I am terrified at the thought of speaking before a group of people. _____

29. I have a feeling of alertness in facing an audience. _____

30. I feel disgusted with myself after trying to address a group of people. _____

Appendix B.

Fear of Negative Evaluation – Brief Form

Read each of the following statements and then use the scale below to indicate the degree to which

each statement applies to you, use the blank to enter the number that corresponds to your answer for

each question.

1	2	3	4	5
Not at All	Slightly	Moderately	Very	Extremely

1. I worry about what other people will think of me even when I know that it doesn't make any difference. _____

2. I am unconcerned even if I know people are forming an unfavorable opinion of me. _____

3. I am frequently afraid of other people noticing my short comings. _____

4. I rarely worry about what kind of impression I am making on someone. _____

5. I am afraid that others will not approve of me. _____

6. I am afraid that people will find fault in me. _____

7. Other people's opinions of me do not bother me. _____

8. When I am talking to someone, I worry about what they may be thinking about me. _____

9. I am usually worried about what kind of impression I make. _____

10. If I know someone is judging me, it has little effect on me. _____

11. Sometime I think I am too concerned with what other people think of me. _____

12. I often worry that I will say or do wrong things. _____

Appendix C.

Liebowitz Social Anxiety Scale (LSAS-SR)

Fill out the following questionnaire with the most suitable answer listed. Base your answers on your experience in the past week and, if you have completed the scale previously, be as consistent as possible in your perception of the situations described. Be sure to answer all items.

Fear or Anxiety	Avoidance
▶ 0 = None	▶ 0 = Never (0%)
▶ 1 = Mild	▶ 1 = Occasionally (1% - 33% of the time)
▶ 2 = Moderate	▶ 2 = Often (33% - 67% of the time)
▶ 3 = Severe	▶ 3 = Usually (67% - 100% of the time)

		Fear or Anxiety	Avoidance
1.	Telephoning in public–speaking on the telephone in a public place	_____	_____
2.	Participating in small groups–having a discussion with a few others	_____	_____
3.	Eating in public places–do you tremble or feel awkward handling food	_____	_____
4.	Drinking with others in public places–refers to any beverage including alcohol	_____	_____
5.	Talking to people of authority–for example, a boss or a teacher	_____	_____
6.	Acting, performing, or giving a talk in front of an audience–refers to a large audience	_____	_____
7.	Going to a party–an average party to which you may be invited; assume you know some but not all people at the party	_____	_____
8.	Working while being observed–any type of work you might do including school work or housework	_____	_____
9.	Writing while being observed–for example, signing a check in a bank	_____	_____
10.	Calling someone you don't know very well	_____	_____

		Fear or Anxiety	Avoidance
11.	Talking with people you don't know very well	_____	_____
12.	Meeting strangers–assume others are of average importance to you	_____	_____
13.	Urinating in a public bathroom–assume that others are sometime present, as might normally be expected	_____	_____
14.	Entering a room when others are already seated– refers to a small group, and nobody has to move seats for you	_____	_____
15.	Being the center of attention–telling a story to a group of people	_____	_____
16.	Speaking up at a meeting–speaking from your seat in a small meeting or standing up in place in a large meeting	_____	_____
17.	Taking a written test	_____	_____
18.	Expressing appropriate disagreement or disapproval to people you don't know very well	_____	_____
19.	Looking at people you don't know very well in the eyes–refers to appropriate eye contact	_____	_____
20.	Giving a report to a group–refers to an oral report in front of a small group	_____	_____
21.	Trying to pick up someone–refers to a single person attempting to initiate a relationship with a stranger	_____	_____
22.	Returning goods to a store where returns are normally accepted	_____	_____
23.	Giving an average party	_____	_____
24.	Resisting a high pressure sales person–avoidance refers to listening to the salesperson for too long	_____	_____

Appendix D.

Long- Term Follow-up Questionnaire

Thank you again for your participation. Information about your experiences is critical to our research and treatment program. Please take a few moments to help us evaluate the effectiveness of our treatment by filling out all of the questions. When answering the questions please think about what has happened since completing treatment in _____.

1.Since completing treatment, how often have you spoken in public:
   - _____ not at all
   - _____ not much, I still avoid
   - _____ not much, no opportunity
   - _____ whenever I needed to

2. Approximately how many times have you spoken in public since completing treatment: _____

3. What types of public speaking activities have you done (e.g. spoken up at meetings, class, church, size of audience, etc)?

_____
_____
_____

4. How comfortable were you the most recent time you spoke in public?
   - _____ 1. Very comfortable
   - _____ 2. Quite comfortable
   - _____ 3. Minimally comfortable
   - _____ 4. Neutral
   - _____ 5. Minimally uncomfortable
   - _____ 6. Quite uncomfortable
   - _____ 7. Very uncomfortable

5. Since completing treatment, have you used alcohol or drugs (e.g., beta blockers) to help you during public speaking activities? If so, what have you used?

_____
   - _____Never
   - _____Rarely
   - _____Sometimes
   - _____About half the time
   - _____Almost all the time
   - _____Every time

6. What is the most important thing you learned from treatment (use back if necessary)?

_____
_____

7. Looking back, please tell us what you would change about the program (use back if necessary)?
_____
_____

8. Which homework assignments do you feel were most/least helpful? Is there anything you would
   change about the homework assignments (use back if necessary)?
_____
_____

9. We want to know how much you have used what you learned during the research study and whether
   it has been helpful. Please use the scale below to rate each item according to the **frequency** of use
   and the degree to which it has been **helpful** (use "na" for not applicable).

1	2	3	4	5	6	7	8	9
Haven't Used				Sometimes Use				Often Use
Not Helpful				Somewhat Helpful				Very Helpful

Frequency   **Helpfulness**

_____   _____   Taking calming breaths

_____   _____   Learning about public speaking anxiety (i.e., avoidance makes it worse)

_____   _____   Setting realistic expectations for myself

_____   _____   Refraining from thinking only about negative aspects of my
                                    performance afterwards.

_____   _____   Focusing my attention off of myself while I am speaking.

_____   _____   Identifying specific goals for speaking situations.

_____   _____   Getting a more realistic image of how I come across to others.

_____   _____   Refraining from using safety behaviors--things that give me an artificial
                                    sense of comfort or safety (e.g., like holding on to an object, so others
                                    can't see my hands shaking)

_____   _____   Practice watching myself (e.g., mirror, on videotape, on webcam)

_____   _____   Continuing to do public speaking (even when it doesn't feel
                                    comfortable)

Frequency   **Helpfulness**

_____   _____   Continuing to face my fears.

_____   _____   Trying to put it out of my mind/distract yourself

_____   _____   Support from therapist

_____   _____   Other: (please describe)

                      _____

Talking back to negative thoughts (please rate the frequency/helpfulness of each of the statements below)

Frequency   **Helpfulness**

_____   _____   "The probability that I will perform poorly is lower than I think."

_____   _____   "The consequence of a poor performance is not as bad as I think."

_____   _____   "I have more control over my anxiety than I think."

_____   _____   "My anxiety doesn't show as much as I think."

_____   _____   "No one expects me to perform perfectly."

_____   _____   "I tend to focus on the negative, it is important for me to pay attention to positive cues too."

10. Have you had any other treatment (therapy) for public speaking anxiety since completing this treatment? Yes _____   No _____

11. If so, what kind of treatment (therapy) and how long did it last?

_____
_____
_____

12. Have you taken any medication specifically for public speaking anxiety since completing this treatment?
Yes _____   No _____

13. If you've had other treatment in what ways was it similar or different from the treatment you received in the study?

_____
_____

14. What was most/least helpful about the additional treatment that you received?

_____
_____

15. Since completing treatment have you had a relapse in your fear?   Yes _____   No _____
    Please describe:

_____
_____

16. Do you think you require additional treatment or booster sessions?   Yes _____   No _____

17. If you think you need additional treatment please tell us what you need help with:

_____
_____

Please indicate whether or not you would be interested in being contacted for future research opportunities.   _____Yes   _____ No

Please continue to next page

Please help us understand the course of your public speaking anxiety and sense of improvement since completing treatment by using the following scales to rate how you. We have written in relevant dates to help you remember. Please include a rating for each time period.

Compared to how I felt before beginning this study, _____ after completing treatment I felt:
(1) Very much improved
(2) Much improved
(3) Minimally improved
(4) Unchanged
(5) Minimally worse
(6) Much worse
(7) Very much worse

	2 Years After Study Date: _____	3 Years After Study Date: _____	4 Years After Study Date: _____	5 Years After Study Date: _____
Very Much Improved	1	1	1	1
Much Improved	2	2	2	2
Minimally Improved	3	3	3	3
Unchanged	4	4	4	4
Minimally Worse	5	5	5	5
Much Worse	6	6	6	6
Very Much Worse	7	7	7	7

Please note any life events/ positive or negative experiences (i.e., additional treatment, job change, different types of public speaking opportunities, negative/positive public speaking experiences) that may have impacted your public speaking fears, since completing treatment. Also, please try to specify the approximate time when these events/ experiences occurred (i.e., 2, 3, 4, or 5 years after treatment).

_____

_____

Appendix E.

LTF Medication Interview

- Have you taken any medication specifically for public speaking anxiety since completing this treatment? Yes _____   No _____

- Please record information regarding *any* medications that participants were taking during the study as well as *any* that they have taken since completing the study. Please include the following:
    - name of the medication
    - what the medication was for (i.e. public speaking anxiety, other psychological issues, medical issues)
    - the dosage
    - frequency (i.e. every day or only as needed)
    - duration (i.e how long medication was taken—record estimates if the participant does not remember exact dates.

- Also, please note whether medications used during the study have/have not been discontinued during the follow-up period. If discontinued please record date. Also, please make of note of any dosage changes.

Name?	What for?	Dose?	How Often?	Start Date?	Stop Date?

Appendix F.

Long-term Follow-up BAT – Participant Ratings

Speaker ID _____   Date _____

Card # _____   Length _____

Please use the following scale to rate your level of anxiety during each of the tasks below:

```
   0    1    2    3    4    5    6    7    8    9    10
not at all              moderately              extremely
anxious                  anxious                 anxious
```

_____ Waiting to get started
_____ Listening to instructions
_____ Preparing a talk
_____ Being in front of the audience
_____ Giving a talk
_____ Post talk

```
Anxiety Ratings During Speech:
      2 min _____
      4 min _____
      6 min _____
      8 min _____
      10 min _____
```
** copy from participant notecard

Using the scale below please rate your performance (circle the number that corresponds with your answer).

How good was the talk?

```
   0      1      2      3      4      5      6      7      8      9      10
not at all                                                          very good
```

Compared to your pre-treatment speech, how would you rate today's speech?

```
   0      1      2      3      4      5      6      7      8      9      10
much worse                             same                      much  better
```

Appendix G.

Long-term Follow-up BAT – Audience Ratings

Rater ID _____   Date _____

Speaker ID _____   Length _____

Rater: Please answer the following demographic questions about **yourself**.

  How old are you? _____

  With what racial group do you most identify? _____

  What is the gender you most identify with? (Please circle response) Female   Male   Neither

Please use the following scale to rate the participant's performance and anxiety:

0	1	2	3	4	5	6	7	8	9	10
not at all										extremely

          _____ How good was the talk?

          _____ How anxious was the speaker?

Comments for the speaker?
_____
_____
_____
_____