Outcome Expectancy, Working Alliance, and Symptom Reduction in Social Anxiety Disorder

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OUTCOME EXPECTANCY, WORKING ALLIANCE, AND SYMPTOM REDUCTION IN
SOCIAL ANXIETY DISORDER

by

AMANDA BENBOW

Under the Direction of Page Anderson, PhD

ABSTRACT

Despite evidence supporting a robust relation between common factors-aspects of the
therapeutic setting that are common across all types of treatment-and treatment response, little is
known about the mechanisms by which these common factors effect change. Two of the most
well-researched common factors include the client’s expectations about the effectiveness of
treatment (termed outcome expectancy), and the quality of the therapeutic relationship (termed
working alliance). Using archival data, the present study tests the hypothesis that the relation
between outcome expectancy and symptom reduction is mediated by the alliance following
treatment for social anxiety disorder. Data were collected in a sample of 65 individuals who
received cognitive behavioral therapy for social phobia with public speaking fears. Mediation
analyses were conducted using Andrew Hayes’ Process Macro (Hayes, 2013). None of the
mediation analyses were significant. These findings suggest that the mechanisms of common
factor variables may vary by disorder.

INDEX WORDS: Common factors, Social anxiety disorder, Cognitive behavioral therapy,
Working alliance, Outcome expectancy, Virtual reality exposure therapy
OUTCOME EXPECTANCY, WORKING ALLIANCE, AND SYMPTOM REDUCTION IN SOCIAL ANXIETY DISORDER

by

AMANDA BENBOW

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Georgia State University
December 2017
DEDICATION

This thesis is dedicated to my mother, for a lifetime of encouragement and support, and to my life-partner, Christopher Draheim.
ACKNOWLEDGEMENTS

My sincere thanks to my committee, Dr. Page Anderson, Dr. Matthew Price, and Dr. Erin Tone, for their support in the development of this document.
# TABLE OF CONTENTS

ACKNOWLEDGEMENTS ......................................................................................... V

LIST OF TABLES ................................................................................................ IX

LIST OF FIGURES ................................................................................................ X

LIST OF ABBREVIATIONS .................................................................................. XI

1 INTRODUCTION .................................................................................................. 1

1.1 Outcome Expectancy and Symptom Reduction ............................................ 1

1.2 Outcome Expectancy, Working Alliance, and Treatment Response ............ 3

1.3 Outcome Expectancy in Social Anxiety Disorder ......................................... 8

1.4 Working Alliance in Social Anxiety Disorder ............................................. 10

1.5 Common Factors in Virtual Reality Exposure Treatment ........................ 11

1.6 The Present Study ........................................................................................ 13

2 METHOD .......................................................................................................... 15

2.1 Participants ................................................................................................... 15

2.2 Measures ..................................................................................................... 16

2.2.1 Structured Clinical Interview for the DSM-IV (SCID; First, Gibbon, Spitzer, & Williams, 1994). .................................................................................. 16

2.2.2 Credibility/Expectancy Questionnaire (CEQ; Borkovec & Nau, 1972). ... 16

2.2.3 Working Alliance Inventory-Short Form (WAI-SF; Tracey & Kokotovic, 1989). ........................................................................................................ 17
2.2.4 Personal Report of Confidence as a Speaker (PRCS; Paul, 1966).............. 17

2.2.5 Fear of Negative Evaluation—Brief Form (FNE-B; Leary, 1983).......... 17

2.3 Procedure ........................................................................................................ 18

2.4 Treatments ........................................................................................................ 19

2.4.1 Virtual Reality Exposure (Anderson, Zimand, Hodges, & Rothbaum, 2005).
.............................................................................................................................. 20

2.4.2 Exposure Group Therapy (Hofmann, 2004)................................................. 21

2.4.3 Wait List........................................................................................................ 21

3 RESULTS........................................................................................................... 21

3.1 Means, standard deviations, and correlations for the primary variables of interest are reported in Tables 3.1 and 3.2. ..................................................... 21

3.2 Data Analysis Approach ................................................................................ 24

3.3 Relations Among Outcome Expectancy, Working Alliance, and Symptom Reduction ........................................................................................................ 26

4 DISCUSSION...................................................................................................... 30

4.1 Outcome Expectancy and Symptom Reduction ............................................. 31

4.2 Working Alliance and Symptom Reduction ................................................. 33

4.3 Unique Mechanisms in Treatment for Social Anxiety Disorder............... 36

4.4 Limitations and Future Directions ............................................................... 37

REFERENCES.................................................................................................... 42
APPENDICES

Appendix A: Self Report Measures ............................................................... 56

Appendix A.1: Credibility/Expectancy Questionnaire ................................. 56

Appendix A.2: Working Alliance Inventory-Short Form ............................ 57

Appendix A.3: Personal Report of Confidence as a Speaker ..................... 58

Appendix A.4: Fear of Negative Evaluation-Brief Form ............................ 59
LIST OF TABLES

Table 3.1 Means and Standard Deviations for All Measures Used in Mediational Analyses ..... 22
Table 3.2 Zero Order Correlations ......................................................................................... 23
Table 3.3 Bootstrapped Point Estimates and Bias-Corrected (BC) Confidence Intervals (CIs) for the Indirect Effects of Outcome Expectancy on Fear of Negative Evaluation .......... 27
Table 3.4 Bootstrapped Point Estimates and Bias-Corrected (BC) Confidence Intervals (CIs) for the Indirect Effects of Outcome Expectancy on Public Speaking Confidence .......... 27
Table 3.5 Bootstrapped Point Estimates and Bias-Corrected (BC) Confidence Intervals (CIs) for the Indirect Effects of Outcome Expectancy on Fear of Negative Evaluation among Individuals in the EGT Condition ........................................................................ 28
Table 3.6 Bootstrapped Point Estimates and Bias-Corrected (BC) Confidence Intervals (CIs) for the Indirect Effects of Outcome Expectancy on Fear of Negative Evaluation among Individuals in the VRE Condition ........................................................................ 29
Table 3.7 Bootstrapped Point Estimates and Bias-Corrected (BC) Confidence Intervals (CIs) for the Indirect Effects of Outcome Expectancy on Public Speaking Confidence among Individuals in the EGT Condition ........................................................................ 29
Table 3.8 Bootstrapped Point Estimates and Bias-Corrected (BC) Confidence Intervals (CIs) for the Indirect Effects of Outcome Expectancy on Public Speaking Confidence among Individuals in the VRE Condition ........................................................................ 30
LIST OF FIGURES

Figure 2.1 Participant flow chart. EGT = exposure group therapy; VRE = virtual reality exposure. ...................................................................................................................... 19

Figure 3.1 A mediational model of working alliance on the relation between outcome expectancy and post-treatment symptom change. $a =$ the relation between outcome expectancy and the working alliance; $b =$ the relation between the working alliance and symptom reduction; $c =$ the total effect: the relation between outcome expectancy and symptom reduction; $c' =$ the direct effect: the relation between outcome expectancy and symptom reduction while controlling for the working alliance. The indirect effect is calculated by $a \times b$ or $c - c'$. ...................................................................................................................... 26
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEQ</td>
<td>Credibility/expectancy questionnaire</td>
</tr>
<tr>
<td>EGT</td>
<td>Exposure group therapy</td>
</tr>
<tr>
<td>FNE-B</td>
<td>Fear of negative evaluation-brief form</td>
</tr>
<tr>
<td>PRCS</td>
<td>Personal report of confidence as a speaker</td>
</tr>
<tr>
<td>SCID</td>
<td>Structured Clinical Interview for the DSM-IV</td>
</tr>
<tr>
<td>VRE</td>
<td>Virtual reality exposure therapy</td>
</tr>
<tr>
<td>WAI-SF</td>
<td>Working alliance inventory-short form</td>
</tr>
</tbody>
</table>
1 INTRODUCTION

One of the oldest and most challenging questions clinical psychology researchers ask is, “How is it that therapy helps people?” Rosenzweig (1936) observed that diverse treatments appear equally helpful, and suggested that aspects of the treatment setting that are shared among all forms of therapy irrespective of theoretical orientation, later termed common factors, are primarily responsible for therapeutic change. As the literature on common factors has developed, researchers have demonstrated a robust relation between common factors variables and treatment response (Lambert, 2005). For example, Cuijpers and colleagues (2012) estimated that common factors contributed to 49.6% of treatment outcomes for depression.

Few studies have explored the mechanisms by which common factors relate to treatment response. Rigorous evaluation of the mechanisms of action of common factors may allow clinicians to more effectively harness their power to enhance treatment. The current study aims to add to the empirical literature on common factors by examining the relation between outcome expectancy and working alliance – two of the most widely researched common factors – and symptom reduction for social anxiety disorder. I propose that positive expectations for treatment improve symptoms of social anxiety via their influence on the working alliance.

1.1 Outcome Expectancy and Symptom Reduction

How a client experiences therapy depends, in part, on his or her beliefs about the extent to which treatment will be successful, termed outcome expectancy (Kazdin, 1979). The construct of outcome expectancy has roots in classic studies of impression formation in social psychology. These studies show that an individual’s expectations about an upcoming interpersonal encounter influence the encounter itself (e.g. Asch, 1946; Kelley, 1950; Secord, 1958). For example, Asch (1946) manipulated impression formation by varying a single word (e.g. warm versus cold) in a
list of descriptive traits. Each participant received one version of the list. Participants then reported their impressions of a target individual based on the list of traits they received, ranked the traits on the basis of their importance, and identified pairs of additional relevant traits from a second list. Although all participants evaluated the same individual, responses differed significantly depending on whether the list included “warm” or “cold.” These results demonstrated that our impressions of others are variable and can be influenced by specific characteristics such as perceived warmth. Psychotherapy researchers soon applied this idea to the therapeutic context. They showed that information about a therapist impacted participants’ perceptions of that therapist as well as the participants’ susceptibility to hypnosis (Greenberg, 1969; Greenberg, Goldstein, & Gable, 1971; Greenberg, Goldstein, & Perry, 1970; Greenberg & Land, 1971).

Subsequent to these early studies, empirical investigations have demonstrated that outcome expectancy is a robust predictor of symptom reduction across a wide range of interventions and disorders (for a recent meta-analysis, see Constantino, Arnkoff, Glass, Ametrano, & Smith, 2011). Positive correlations between outcome expectancy and symptom reduction have been reported following treatment for a variety of psychological conditions including mood disorders (Meyer, Pilkonis, Krupnick, Egan, Simmens, & Sotsky, 2002), social anxiety disorder (Price & Anderson, 2012), eating disorders (Constantino, Arnow, Blasey, & Agras, 2005), and personality disorders (Wenzel, Jeglic, Levy-Mack, Beck, & Brown, 2008). Outcome expectancy was also associated with better health outcomes among people diagnosed with cardiac conditions and chronic pain (Mondloch, Cole, & Frank, 2001).

Therapeutic interventions from a variety of theoretical orientations have been adapted to improve outcome expectancy during the first session (Meyer et al., 2002). One such adaptation is
presentation of the treatment rationale (Ahmed & Westra, 2009; Kazdin & Krouse, 1983). In a
study conducted by Ahmed and Westra (2009), undergraduates with high levels of fear of
negative evaluation completed standardized measures of outcome expectancy before and after
watching a video of an experienced therapist providing a treatment rationale for cognitive-
behavioral therapy for social phobia (Ahmed & Westra, 2009). Presentation of the video was
associated with improvements in outcome expectancy, increased perceived helpfulness of
exposure, and better confidence in participating in exposures. These findings support the
conclusion that the presentation of the treatment rationale is a therapeutic intervention targeting
outcome expectancy which may, in turn, facilitate symptom reduction. Yet little is known about
the mechanisms by which outcome expectancy is related to symptom reduction.

1.2 Outcome Expectancy, Working Alliance, and Treatment Response

Positive outcome expectancy may improve psychological symptoms by engendering
client engagement in the therapeutic process. One way in which client engagement has been
conceptualized is via quality of the working alliance (Abouguendia, Joyce, Piper, &
Ogrodniczuk, 2004; Gaudiano & Miller, 2006; Johansson, Høglend, & Hersoug, 2011; Joyce,
Ogrodniczuk, Piper, & McCallum, 2003; Meyer et al., 2002). The working alliance, or the
collaborative bond between client and therapist, is a well-established predictor of symptom
reduction across a variety of treatments and disorders (see Horvath, Del Re, Flückiger &
Symonds, 2011 for a recent meta-analysis). The working alliance, in fact, is one of the most
robust and well-validated common factors in treatment outcome research, accounting for 8% of
the total variance in symptom reduction (Horvath et al., 2011; Wampold, 2013).

Relations among outcome expectancy, working alliance, and treatment response have
been investigated broadly. Several studies show that the working alliance mediates the relation
between outcome expectancy and treatment response (Abouguendia, et al., 2004; Johansson et al., 2011; Joyce et al., 2003; Meyer et al., 2002). The first group to examine this mediational model was Meyer and colleagues (2002). Using data from the National Institute of Mental Health Treatment of Depression Collaborative Research Program (Elkin et al., 1989), Meyer and colleagues (2002) examined associations among outcome expectancy, working alliance, and symptom reduction in 151 individuals diagnosed with depression. Participants received at least 12 sessions of interpersonal therapy, cognitive behavioral therapy, imipramine with clinical management, or placebo with clinical management. Outcome expectancy was operationalized by participant’s responses to a single item prior to the first session: “Which of the following best describes your expectations about what is likely to happen as a result of your treatment?” Participants rated this item on a 5-point likert-type scale ranging from 1 (I expect to feel completely better) to 5 (I don’t expect to feel any different). Working alliance was based on the patient contributions scale from the Vanderbilt Therapeutic Alliance Scale (Krupnick et al., 1996), and was averaged across sessions. This scale was designed to quantify the strength of the working alliance based on the client’s active and constructive engagement. Residual gain scores from a composite of the Beck Depression Inventory (Beck & Steer, 1987) and of the Hamilton Rating Scale (Hamilton, 1960) were calculated to assess symptom reduction. Results showed that the working alliance partially mediated the relation between outcome expectancy and improvement in symptoms. The authors drew on goal theory to interpret their results. Goal theory posits that the expectation that a goal can realistically be reached is necessary for people to continue to work towards achieving that goal (Austin & Vancouver, 1996; Carver & Scheier, 1998). The authors concluded that positive outcome expectancies led to symptom reduction by supporting participants’ efforts towards accomplishing therapeutic goals (Meyer et al., 2002).
such, therapy clients with positive outcome expectancies may be more inclined to view
therapeutic improvement as an attainable goal and thus be more engaged in the therapeutic
alliance (Meyer et al., 2002).

Though Meyer and colleagues did not assess client effort more generally, evidence from
another study of 36 participants with mild head injury suggests that persistent effort may indeed
mediate the relation between outcome expectancy and symptom reduction (Suhr & Gunstad,
2002). Outcome expectancy was manipulated by providing participants with instructions that
were either neutral or pessimistic about the effects of head injury on neuropsychological testing.
Relative to those who received neutral instructions, individuals who received pessimistic
instructions reported making less of an effort during testing. They also performed significantly
worse on measures of general intellect and memory. These results support the idea that outcome
expectancy influences clients’ motivational effort in therapy, which in turn contributes to
reduction in symptoms. Increased effort may also manifest as enhanced quality of the working
alliance (Meyer et al., 2002).

Several researchers have extended Meyer’s and colleagues’ (2002) findings by testing the
mediating role of the working alliance on the relation between outcome expectancy and
treatment response in a variety of therapeutic contexts. Joyce and her collaborators conducted
two separate studies evaluating this mediational model. In the first study, 144 individuals with a
variety of diagnoses received 20 individual sessions of interpretive or supportive therapy (Joyce
et al., 2003). Outcome expectancy was assessed by participant ratings of expected improvement
for 2-5 specific complaints. Both the participant and therapist rated the working alliance.
Alliance was measured by six items assessing the quality of the therapeutic relationship during a
given session, and was averaged across sessions. Treatment response, collected from the
participant, the therapist, and an independent assessor, was measured using post-therapy residual gain scores of severity of distress and ratings of improvement. Results showed that 20-40% of the variance from the relation between outcome expectancy and treatment response was accounted for by the effect of the working alliance as rated across all informants (participant and therapist-rated alliance; participant, therapist, and independent assessor ratings of treatment response).

In the second study, Abouguendia and colleagues (2004) assessed the mediational role of the alliance among individuals receiving interpretive or supportive group treatment for complicated grief. Participant ratings of expected improvement were used to assess outcome expectancy. An average working alliance score was derived from participants’ and therapists’ responses to six items measuring the therapeutic relationship in a given session. Treatment response, rated by the therapist, participant, and an independent assessor, was based on residual change scores from 14 measures of symptoms and functioning collected via questionnaires and interviews. Responses to the outcome measures were collapsed into three factors: general symptoms, grief symptoms, and target objectives/life dissatisfaction. Results showed that 19-52% of the variance from the relation between outcome expectancy and treatment response was accounted for by the working alliance as rated by the participants, but not by the therapists. This finding was consistent across all sources rating treatment response (participants, therapists, and an independent assessor).

Johansson and colleagues (2011) found that the alliance mediated the relation between outcome expectancy and treatment response for psychodynamic treatment. Participants included 100 individuals receiving psychodynamic treatment for a variety of psychological concerns including anxiety, depression, personality disorder, and interpersonal problems. Outcome
expectancy was measured by a visual analogue scale. The scale asked, “How successful do you believe that therapy will be?” Responses ranged from 1 = “totally useless,” to 100 = “all my problems will disappear.” The authors used the Working Alliance Inventory (WAI; Horvath & Greenberg, 1989) to assess the quality of the working alliance at the seventh session. Treatment response was assessed a year after treatment completion using the Psychodynamic Functioning Scales (Høglend, Bøgwald, Amlo, Heyerdahl, Sørbye, & Marble, 2000) and the Global Assessment of Functioning Scale (GAF; American Psychiatric Association, 1987). The working alliance, when rated by the participant, mediated the relation between outcome expectancy and improvements in functioning. Thus, the working alliance partially mediated the relation between outcome expectancy and treatment response across a variety of therapeutic orientations and psychological concerns.

Positive outcome expectancy has also been associated with a reduction in treatment dropout (for a review see Greenberg, Constantino, & Bruce, 2006). Gaudiano and Miller (2006) examined the extent to which the therapeutic alliance mediated the relation between outcome expectancy and attrition in 61 individuals with bipolar disorder receiving pharmacotherapy or pharmacotherapy plus family intervention. They utilized the 4-item Credibility and Expectancy Scale (CES: Borkovec & Nau, 1972) to measure outcome expectancy. Working alliance was assessed via the Working Alliance Inventory (WAI: Horvath & Greenberg, 1989). Both the participant and the therapist completed the WAI two months after the beginning of the study. Alliance accounted for 53% and 50% of the variance in the relation between outcome expectancy and the number of months spent in therapy when rated by the participant and by the psychiatrist, respectively. In other words, participants with optimistic outcome expectations stayed in treatment longer, and this relation was due, in part, to the quality of the working alliance.
In summary, studies have consistently shown that the working alliance (measured in different ways and from difference sources) partially mediates the relation between outcome expectancy and treatment response using a variety of therapeutic interventions to treat a variety of problems including complicated grief, depression, anxiety, personality disorder, and interpersonal problems (Abouguendia et al., 2004; Johansson, et al., 2011; Joyce et al., 2003; Meyer et al., 2002). Researchers used a variety of measures with unknown psychometric properties to assess outcome expectancy and working alliance across studies. This includes use of single-item measures of outcome expectancy, a portion of a known alliance measure, and a six-item alliance questionnaire developed by the authors (Abougendia et al., 2004; Meyer et al., 2002; Joyce et al., 2003). Despite the considerable variability in measures, methods, and client populations, a body of research shows that the working alliance mediates the relation between outcome expectancy and treatment response. Thus, the working alliance may be a primary mechanism through which outcome expectancy leads to therapeutic change.

1.3 Outcome Expectancy in Social Anxiety Disorder

The relations among outcome expectancy, working alliance, and symptom reduction have not yet been examined in a sample of individuals with a primary diagnosis of social anxiety disorder. Social anxiety disorder is characterized by persistent fears of social interactions in which there is potential for negative evaluation (American Psychiatric Association, 2013). It is one of the most common of the anxiety disorders (Kessler, Chiu, Demler, & Walters, 2005), and is associated with significant disability. For instance, individuals with social anxiety disorder demonstrate impairment in a variety of domains including work/studies and social life (Aderka, Hofmann, Nickerson, Hermesh, Gilboa-Schectman, & Marom, 2012). Social anxiety disorder is also associated with lower social-economic status, decreased levels of education, and a decreased
likelihood of being married (Schneier, Johnson, Hornig, & Liebowitz, 1992). Further, social anxiety disorder is independently associated with increased risk for suicide ideation and attempts (Thibodeau, Welch, Sareen, and Asmundson, 2013).

Studies examining the association between outcome expectancies and symptom reduction among people with social anxiety disorder yield mixed findings. There have been several studies on the topic, with some reporting a positive relation and some reporting null findings. For example, Rapee, Gaston, and Abbott (2009) reported no relation between outcome expectancy and symptom reduction for three different treatments of social anxiety disorder: cognitive restructuring, in vivo exposure, and a combination of the two. Chambless, Tran, and Glass (1997) also reported no relation between outcome expectancy and symptom improvement following cognitive-behavioral group therapy for social anxiety disorder. Westra, Dozois, and Marcus (2007) reported that outcome expectancy was positively related to symptom improvement (measured following session 4) for individuals with a secondary diagnosis of social anxiety disorder, but not for those with a primary diagnosis. The authors noted that the small sample size of individuals with primary social anxiety resulted in inadequate power to detect an effect of outcome expectancy on symptoms.

In contrast, a study conducted by Safren, Heimberg, and Juster (1997) reported a modest positive relation between outcome expectancy and symptom improvement among clients receiving cognitive-behavioral group therapy for social phobia, accounting for 1-4% of the variance. In addition, Price and Anderson (2012) found that outcome expectancy was a significant predictor of change in self-reported public speaking fears among individuals with social anxiety disorder receiving virtual reality exposure therapy or exposure group therapy, accounting for 16-33% of the variance. To date, this is the strongest finding demonstrating that
outcome expectancy predicts significantly faster symptom reduction in social anxiety disorder. It is also consistent with the positive relation between outcome expectancy and treatment response reported for a variety of treatments and disorders (for a recent meta-analysis, see Constantino et al., 2011). Taken together, these findings suggest that outcome expectancy may contribute to symptom reduction following cognitive behavioral treatments for social anxiety disorder. Enhanced understanding of the mechanisms by which outcome expectancy influences symptoms may be used to improve the efficacy of treatments for social phobia. These mechanisms have not yet been identified. Consistent with prior research (Abouguendia et al., 2004; Gaudiano & Miller, 2006; Johansson, et al., 2011; Joyce et al., 2003; Meyer et al., 2002), the working alliance represents a promising candidate mechanism of action.

1.4 Working Alliance in Social Anxiety Disorder

The empirical literature examining the relation between the working alliance and symptom reduction for those with social anxiety disorder is, thus far, characterized by null findings. For example, Mörtberg (2014) examined the role of the working alliance among a sample of individuals receiving group or individual cognitive behavioral therapy for social anxiety disorder. Working alliance was stronger among those who received individual compared to group therapy; working alliance, however, was not significantly related to outcome for either group. Other researchers have also reported null findings regarding the relation between working alliance and symptom reduction for individual, group, and internet-based cognitive-behavioral therapy for social anxiety disorder (Andersson et al., 2012; Woody & Adessky, 2003). Woody and Adessky (2003) examined the relation between the working alliance and symptoms in 53 individuals who received cognitive-behavioral group therapy for social phobia. Though working alliance ratings improved over time, they were unrelated to outcome. Andersson and colleagues
(2012) examined the working alliance in three different clinical samples of individuals receiving internet-delivered cognitive behavioral therapy, including individuals diagnosed with depression, generalized anxiety disorder, and social anxiety disorder. Although alliance ratings were high for all three samples, the alliance was not significantly related to outcome for any group, including social anxiety disorder.

Taken together, these studies show that the working alliance is not related to symptom reduction following cognitive-behavioral therapy for social anxiety disorder using a variety of treatment formats. These findings are inconsistent with evidence that the working alliance has been shown to have both a direct and indirect effect on symptom improvement across a variety of treatment contexts (Abouguendia, et al., 2004; Johansson et al., 2011; Joyce et al., 2003; Meyer et al., 2002). These null findings are also surprising in light of evidence that levels of the working alliance tend to be high and increase over the course of treatment for social phobia (Andersson et al., 2012; Ngai, Tully, & Anderson, 2015; Woody & Adessky, 2003). For example, Ngai and colleagues (2015) assessed the development of the working alliance using data from the same parent study as is used in the present study (Anderson et al., 2013). Ngai and colleagues (2015) used hierarchical linear modeling analyses to demonstrate that the working alliance improved throughout treatment, with more rapid increases taking place during earlier treatment sessions. Notably, null findings do not mean that an effect is absent, particularly when an effect has been investigated by such a small number of studies. As such, additional research is needed to assess the relation between the working alliance and symptoms of social anxiety.

1.5 Common Factors in Virtual Reality Exposure Treatment

Though common factors have been studied widely within traditional therapeutic contexts, such as individual or group face-to-face treatments (Stevens, Hynan, & Allen, 2000), much less
is known about the role of common factors in technology-based treatments such as virtual reality exposure therapy (VRE). In VRE, clients wear a headset that immerses them in an interactive, computer-generated, 3-dimensional environment where they confront feared stimuli (Carlin, Hoffman, & Weghorst, 1997; North, North, & Coble, 1997; Rothbaum & Hodges, 1999). Notably, major differences in the presentation of technology-based treatments relative to traditional therapeutic approaches may influence the relevance of certain common factors (Kazdin, 2005).

The relevance outcome expectancy in VRE may be influenced by its unique features. For example, the novelty of virtual reality technology may enhance expectations of therapeutic improvement, as evidenced by findings reported by Kazdin and Krouse (1983). The authors showed that treatment rationales referring to the novelty of a treatment were positively related to outcome expectancy. Accordingly, a positive relation between outcome expectancy and the rate of symptom improvement has been reported following VRE for specific phobia (Price, Anderson, Henrich, & Rothbaum, 2008) and social anxiety disorder (Price & Anderson, 2012).

Certain aspects of VRE may also influence working alliance. The equipment used to present the virtual reality environment to the client prevents the therapist from making eye-contact with the client and vice versa, which may impair the quality of the alliance (Meyerbröker & Emmelkamp, 2008). In addition, some evidence suggests that therapists are more distracted during administration of VRE (Wrzesien, Burkhardt, Botella, & Alcañiz, 2012).

Despite the concerns noted above, one study reported high levels of working alliance when VRE was used with children and adolescents receiving treatment for flying fears (Chu, Choudhury, Shortt, Pincus, Creed, & Kendall, 2005). Additionally, no differences were found in self-reports of working alliance when VRE was compared to group exposure therapy for social
anxiety disorder (Anderson et al., 2013). Therefore, the treatment issues inherent in VRE (e.g., limited eye contact) do not seem to preclude the development of the working alliance, but more research is needed to explore this possibility.

Technology-based treatments such as VRE are expected to increase in utilization and popularity over the next five years (Norcross, Pfund, & Prochaska, 2013). Nonetheless, research on the role of common factors in VRE is scarce. Given that common factors are robust predictors of outcome, it is vital that developers of novel treatments such as VRE be aware of the extent to which common factors apply and how these factors may be enhanced.

1.6 The Present Study

The present study contributes to the literature by being the first to examine the extent to which the working alliance mediates the relation between outcome expectancy and symptom reduction following VRE treatment among a sample of individuals with a primary diagnosis of social anxiety disorder. In addition, the current study improves upon the methodology of prior research investigating the mediational role of the working alliance in two ways: with the exclusive use of standardized measures and with the application of more sophisticated statistical analytic techniques.

First, the present study uses standardized measures of outcome expectancy and working alliance. Outcome expectancy is measured by the Credibility and Expectancy Scale (CES; Devilly & Borkovec, 2000), which is a standardized measure with known psychometric properties. In comparison, the reliability and validity of the measures of outcome expectancy used in previous mediational studies, including use of a single item (Johansson et al., 2011; Meyer et al., 2002) or an aggregate rating of expected improvement on specific objectives (Abouguendia et al., 2004; Joyce et al., 2003), are unknown. In addition, the present study uses
the Working Alliance Inventory-Short Form (WAI-SF; Tracey & Kokotovic, 1989) to measure the working alliance. The WAI-SF is also a validated and widely used measure with known psychometric properties (Busseri & Tyler, 2003). In comparison, other researchers evaluating the mediational role of the working alliance have used measures they developed themselves for the purpose of their study (Abouguendia et al., 2004; Joyce et al., 2003). The present study’s use of standardized measures decreases potential for measurement error (Kazdin, 2003), thus improving upon the methodologies used in previous studies (Abouguendia et al., 2004; Johansson et al., 2011; Joyce et al., 2003; Meyer et al., 2002).

Second, all known mediational studies of outcome expectancy, working alliance, and treatment response have used analytical methods that have received heavy criticism in recent years. These methods include the Baron and Kenny (1986) approach to mediation and the Sobel test of the indirect effect (Sobel, 1982, 1986). The Baron and Kenny (1986) method has been criticized for its emphasis on the significance of direct and total effects resulting in high rates of Type II error (Shrout & Bolger, 2002). The Sobel test has also received criticism due to evidence of frequent violations of the normality assumption in the majority of mediational studies, limiting power to detect an effect (Stone & Sobel, 1990). In contrast, the present study utilizes bootstrapping procedures to assess the indirect effect of the working alliance on the relation between outcome expectancy and reduction in symptoms of social anxiety. Bootstrapping approaches place greater emphasis on the indirect effect, are less susceptible to violations of the normality assumption, and are significantly less prone to Type II error relative to the Baron and Kenny (1986) approach (Hayes, 2013).

Archival data (Anderson et al., 2013) will be used to explore the hypothesis that the working alliance will have an indirect effect on the relation between outcome expectancy and
symptom reduction following both VRE and EGT for social anxiety disorder, as is consistent with previous research (Abouguendia et al., 2004; Gaudiano & Miller, 2006; Johansson et al., 2011; Joyce et al., 2003; Meyer et al., 2002).

2 METHOD

2.1 Participants

Participants were 65 individuals diagnosed with social anxiety disorder. About half of the participants ($n = 32$) met criteria for the generalized subtype. Eligibility criteria included the ability to speak English, a diagnosis of social anxiety disorder with predominant public speaking fears, and any psychoactive medication use that, if present, must have been stable in terms of medication(s) and dosage(s) for a minimum of 3 months prior to the study and throughout the course of the study. Exclusion criteria included: (a) history of mania, schizophrenia, or other psychoses; (b) current suicidal ideation; (c) current alcohol or substance dependence; (d) inability or unwillingness to tolerate the virtual reality helmet; (e) history of seizures; (f) concurrent psychotherapy for social anxiety disorder.

Participants ranged in age from 19 to 69 years ($M = 40.05$, $SD = 11.80$), and were predominantly female (66%, $n = 45$). Participants self-identified as “Caucasian” ($n = 35$), “African American” ($n = 18$), “Hispanic” ($n = 3$), “Asian American” ($n = 2$), or “Other” ($n = 7$). The participants who selected “Other” described their race as, “African American, Indian, and Caucasian,” “Chinese,” “Asian,” “African,” “Arabic,” “Eritrean American,” and “biracial.” In general, the sample was well-educated, with 32% completing college. Forty-six percent of participants reported an annual income of $50,000 or more, and 52% reported being “married.” The majority of participants did not have a comorbid diagnosis ($n = 51; 79$%). Secondary
diagnoses, where present, included specific phobia ($n = 4$), major depression ($n = 3$), generalized anxiety disorder ($n = 3$), dysthymia ($n = 2$), and panic disorder without agoraphobia ($n = 2$).

2.2 Measures

2.2.1 *Structured Clinical Interview for the DSM-IV (SCID; First, Gibbon, Spitzer, & Williams, 1994).*

Inclusion in the study was dependent on diagnoses which were determined via administration of the anxiety, mood, and substance disorder modules of the SCID. The SCID was conducted by doctoral students who were trained and supervised by a clinical psychologist. Training on administration of the SCID included review of training videos created by the developers of the SCID and mock interviews with fellow students, which were viewed by a licensed psychologist with considerable experience with diagnostic interviewing for treatment studies. Students were supervised weekly on their administration of the SCID. All diagnostic assessments were videotaped, and a randomly selected subset ($N = 10$) were reviewed by a licensed psychologist. Interrater reliability for the primary diagnosis was 100%, and there was one disagreement on clinical severity rating.

2.2.2 *Credibility/Expectancy Questionnaire (CEQ; Borkovec & Nau, 1972).*

Treatment credibility was assessed with an adaptation of the four-item CEQ. Questions were modified slightly for this study in order to apply to symptoms of social anxiety. Scores range from 4 to 36 with higher scores reflecting more positive expectations of treatment credibility. The CEQ has been used in a wide variety of clinical populations, and has demonstrated good internal consistency ($\alpha > .80$) (Rodebaugh, 2004; Taylor & Alden, 2010) and stability over time (Rapee et al., 2009). Internal consistency for the current study was acceptable ($\alpha = .77$).
2.2.3 **Working Alliance Inventory-Short Form (WAI-SF; Tracey & Kokotovic, 1989).**

The WAI-SF is a 12-item questionnaire used to assess the therapeutic alliance. Scores range from 0 to 84 with higher scores reflecting a stronger alliance. The short form has been shown to be highly correlated with the original version in terms of descriptive statistics, internal consistencies, subscale intercorrelations, and predictive validity (Busseri & Tyler, 2003). Internal consistencies for participant ratings of the full scale and short form versions of the WAI were .95 and .97 at the 4th session and .95 and .88 at the final session, respectively (Busseri & Tyler, 2003). In the present study, participants completed the WAI at each of the 8 treatment sessions. Internal consistencies for the current study ranged from .78 - .92 across sessions.

2.2.4 **Personal Report of Confidence as a Speaker (PRCS; Paul, 1966).**

The PRCS is a 30 item self-report questionnaire used to assess behavioral and cognitive responses to public speaking. Participants read a series of statements such as “I look forward to an opportunity to speak in public,” and respond in a true false format. A scoring algorithm is used to determine a summary score, with higher scores indicating less confidence with public speaking. The PRCS has demonstrated good internal consistency, $\alpha = .91$ (Klorman, Weerts, Hastings, Melamed, & Lang, 1974). Internal consistency for the present study was $\alpha = .61$ for pre-treatment and $\alpha = .91$ for post-treatment. Pre-treatment PRCS scores were examined for data entry error and outliers. No errors or outliers were detected.

2.2.5 **Fear of Negative Evaluation—Brief Form (FNE-B; Leary, 1983).**

The FNE-B is a 12-item questionnaire measuring the degree to which individuals fear being negatively evaluated by others across a number of social settings. Items are rated on a 5-point scale, and scores range from 12–60, with higher scores representing greater evaluative concerns. The FNE-B has demonstrated excellent internal consistency ($\alpha = .97$) and test–retest
reliability \( (r = .94; \text{Collins, Westra, Dozois, } \& \text{ Stewart, 2005}). \) Internal consistency for the current study was \( \alpha = .89 \) for pre-treatment and \( \alpha = .87 \) for post-treatment.

All self-report measures are included in the Appendix.

### 2.3 Procedure

All study procedures were approved by the university’s Institutional Review Board. Recruitment methods included newspaper advertising, flyers, internet-based outlets, and referrals from professionals and other study participants. Participants were screened for eligibility first with a questionnaire administered over the telephone followed by an in-person diagnostic interview during which doctoral students blind to treatment assignment administered the SCID. Eligible participants were randomly assigned to one of three groups: VRE, EGT, or a wait-list control using a computerized random number generator. Participants assigned to the wait-list condition were rerandomized to the VRE or the EGT condition following the waiting period (see Figure 2.1 for flow of participants through the study).

Participants completed self-report measures on symptoms (PRCS, FNE-B) at the screening visit prior to being randomized to a condition (pre-treatment), at the end of the fourth treatment session (mid-treatment), and at the end of the last session (post-treatment). Outcome expectancy was assessed following the presentation of the rationale for treatment at the first session, and working alliance was assessed at every treatment session. All assessment and treatment sessions were conducted at a psychology clinic located at an urban research university that is accessible by public transportation.
2.4 Treatments

Five study therapists conducted treatment sessions. Two therapists were licensed psychologists who were experienced in implementation of manualized cognitive behavior therapy. Three therapists were doctoral students in clinical psychology. All therapists attended two-day intensive training workshops conducted by the developers of the treatments prior to

Figure 2.1 Participant flow chart. EGT = exposure group therapy; VRE = virtual reality exposure.
administering the study protocol. All five therapists administered both treatments – therapists were not nested within treatment type. All treatment sessions were video recorded, and a randomly selected subset of treatment sessions (14%) were reviewed by the developers of the respective treatments and rated for compliance. Compliance ratings were 92% for VRE and 93% for EGT. The developers reported one infraction for each treatment arm across all sessions reviewed. Both treatments consisted of a treatment rationale and psychoeducation about social anxiety disorder in the first session followed by seven sessions designed to treat social anxiety disorder. Sessions targeted self-focused attention, negative perceptions of self and others, perceptions of lack of emotional control, unrealistic goal setting for feared situations, and relapse prevention. Participants in both the VRE and EGT treatment conditions were assigned homework throughout treatment, including a daily mirror task, regular monitoring of social encounters, and identification of cognitive biases. Exposure began in session 2 for EGT and session 5 for VRE to equalize the amount of exposure therapy received across the two treatment groups.

2.4.1 **Virtual Reality Exposure (Anderson, Zimand, Hodges, & Rothbaum, 2005).**

VRE was conducted on an individual basis. Fear hierarchies were used to determine the order in which exposures were presented. Participants completed exposures at each point on the hierarchy until their fear decreased according to subjective report. Exposures were administered in 3 different virtual reality settings: 1) a conference room with 5 people seated around a table, 2) a classroom setting with approximately 35 audience members, and 3) a large auditorium with approximately 100 audience members. Participants wore a helmet with audio, visual, and motion tracking capabilities to present the virtual reality scenarios. The therapist maintained audio contact with the participant at all times. Therapists were able to manipulate the intensity of
exposure sessions by selecting audience reactions ranging from supportive nodding and smiling to appearing offended, bored, or distracted. Therapists could also select questions from a standardized list or tailored for the client using therapist voiceover, which were posed by the virtual audience members. Exposure sessions lasted up to 30 minutes over four sessions for a total of 120 minutes.

2.4.2 Exposure Group Therapy (Hofmann, 2004).

EGT was conducted in a group setting which was co-led by a licensed therapist and a student therapist. During exposure, participants were video recorded while giving brief speeches in front of the group, after which the video was reviewed while group members provided feedback. Later exposures incorporated social mishaps such as making unreasonable requests that have a high likelihood of rejection for an individual whose primary fear is rejection. On average, exposures lasted for 20 minutes each over the course of six sessions for a total of 120 minutes.

2.4.3 Wait List.

The waiting period was 8 weeks. At the end of the waiting period, participants completed self-report measures and were randomized to either VRE or EGT and received the treatment as described above.

3 RESULTS

3.1 Means, standard deviations, and correlations for the primary variables of interest are reported in Tables 3.1 and 3.2.

Descriptive statistics for all variables of interest are provided in Table 3.1. In order to ensure that the regression analyses in the present study offered the best linear unbiased estimates
of population values, the assumptions of absence of specification error, homoscedasticity, independence of residuals, normal distribution of error terms, and absence of multicollinearity were assessed according to the recommendations of Field (2013). Most assumptions of parametric regression analysis were met in the present study. In order to detect specification error, residuals for outcome expectancy and working alliance measured at session 4, session 8, and averaged across sessions were plotted against fear of negative evaluation and speaking confidence ratings. Heteroscedasticity was detected with regard to the relation between residuals of working alliance measured at the eighth session and both fear of negative evaluation ratings and speaking confidence ratings. Therefore, a heteroscedasticity-consistent standard error estimator, HC3, was applied to the mediation analyses including working alliance measured at the eighth session. The appearance of constant residual variance and fairly even distribution of data points in all other plots suggested that the assumptions of homoscedasticity and linearity were met. The assumption of independence of residuals was assessed with the Durbin-Watson test. Scores on the Durbin-Watson ranged from 1.62 to 2.31, suggesting an absence of autocorrelation. Histograms were created to assess normality of residuals. Slightly skewed distributions were observed, but the sample size was sufficient to overcome biased results due to skew based on recommendations from Field (2013).

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome expectancy</td>
<td>29.48</td>
<td>4.82</td>
</tr>
<tr>
<td>Working alliance (session 4)</td>
<td>78.13</td>
<td>6.08</td>
</tr>
<tr>
<td>Working alliance (session 8)</td>
<td>79.29</td>
<td>6.82</td>
</tr>
<tr>
<td>Working alliance (mean)</td>
<td>78.47</td>
<td>4.95</td>
</tr>
</tbody>
</table>

Table 3.1 Means and Standard Deviations for All Measures Used in Mediational Analyses
Fear of negative evaluation (pre-treatment) 42.86  9.24
Fear of negative evaluation (post-treatment) 36.48  8.16
Speaking confidence (pre-treatment) 25.37  2.76
Speaking confidence (post-treatment) 13.36  7.41

Zero-order correlations are reported in Table 3.2. No correlations were > .8, suggesting that the variables in the model were not exceedingly large for regression analysis. Outcome expectancy was positively correlated with working alliance at session 4 ($r = .36, p = .012$) and session 8 ($r = .36, p = .014$), suggesting that more positive expectations of therapeutic improvement were associated with a better relationship between the therapist and the participant at the mid-point and at the conclusion of therapy. Outcome expectancy was negatively correlated with personal report of confidence of a speaker ratings ($r = -.31, p = .024$). In other words, positive expectations that therapy will be effective reported at the beginning of treatment were associated with improved speaking confidence reported at the end of treatment. In addition, working alliance measured at session four was negatively correlated with fear of negative evaluation ($r = -.30, p = .029$). Reports of a better-quality relationship between the therapist and the participant were associated with lower self-reported fear of being negatively judged.

<table>
<thead>
<tr>
<th>Table 3.2 Zero Order Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>1. Outcome expectancy</td>
</tr>
<tr>
<td>2. Working alliance (session 4)</td>
</tr>
<tr>
<td>3. Working alliance (session 8)</td>
</tr>
<tr>
<td>4. Working alliance (mean)</td>
</tr>
<tr>
<td>5. Fear of negative evaluation</td>
</tr>
</tbody>
</table>
3.2 Data Analysis Approach

Traditional approaches to mediation analyses required a significant total effect, defined as the relation between the predictor variable and the outcome variable (Baron & Kenny, 1986). This total effect was considered to be a pre-condition for mediation analysis on the basis that a causal mechanism for an effect cannot be identified if there is no evidence of a significant relation between the predictor variable and the outcome variable in the first place. The total effect was also used to determine whether a relation was fully or partially mediated by the mediator variable. Once a total effect had been identified, the direct effect—defined as the relation between the predictor and the outcome variable after controlling for the mediator, and the indirect effect were calculated. A Sobel test has traditionally been used to test the significance of the indirect effect. Full mediation is implicated when the indirect effect is significant while the direct effect is not significant.

More recently, researchers have not used this approach to mediation analysis. Simulations have shown that indirect effects may be present in the absence of total and direct effects in as many as 50% of studies (Rucker et al., 2011). Instances may also occur where a significant indirect effect is detected in the absence of both the total and direct effect. Possible reasons for the presence of indirect effects in the absence of a total and/or a direct effect include asymmetries in power to detect indirect and total/direct effects. As such, researchers recommend that the emphasis on the significance of the total and direct effect be abandoned. Instead, researchers are encouraged to focus on the size of the indirect effect (Rucker et al., 2011).
Use of the Sobel test to probe the significance of the indirect effect has also fallen out of favor (Hayes, 2013). As a parametric approach, the Sobel test relies on the assumption of normality, which is frequently violated when calculating the indirect effect. As a result, the Sobel test is prone to Type II error. An alternative approach to the Sobel test, which is applied in the current study, is bias corrected bootstrap confidence intervals (Hayes, 2013). Bootstrap confidence intervals use resampling with replacement to generate a sampling distribution of the indirect effect generated from collected data, which is then used to construct a confidence interval. A 95% confidence interval represents a range of values in which the population value is 95% likely to fall (Field, 2013). Confidence intervals that do not contain 0 imply a statistically significant effect (Field, 2013).

The bootstrap confidence interval approach is not, however, without criticism, as outliers will bias results in studies with very small sample sizes. All variables of interest were inspected for outliers in the present study using the outlier labeling rule with the constant value = 2.2 (Hoaglin & Iglewicz, 1987). No outliers were detected.

Power was assessed based on recommendations from Fritz and MacKinnon (2007) derived from simulation analyses used to determine the sample size required for .8 power to detect an effect using a variety of mediation analysis methods. Price and Anderson (2012) reported a medium-large effect for the relation between outcome expectancy and treatment response using data from the same parent study (Anderson et al., 2013). Based on this finding, a large effect was selected for the power estimate of this relation. The summary effect size of the relation between working alliance and treatment response following cognitive-behavioral therapy has been reported as .35 in a recent meta-analysis (Horvath, 2011), which represents a medium effect. This value was selected for the present power analysis. Based on these values, a sample
size of 59 is needed (Fritz & MacKinnon, 2007). Thus, our sample (N=65) suggests adequate power for the present analyses.

3.3 Relations Among Outcome Expectancy, Working Alliance, and Symptom Reduction

In the present study, mediation analyses were used to examine whether working alliance (M), measured at the 4\textsuperscript{th} session, the 8\textsuperscript{th} session, and averaged across sessions, mediated the relation between outcome expectancy (X) and treatment response (Y) at post-treatment controlling for pre-treatment scores and treatment condition (VRE or EGT). Figure 3.1 illustrates this model.

![Diagram](image)

*Figure 3.1 A mediational model of working alliance on the relation between outcome expectancy and post-treatment symptom change. a = the relation between outcome expectancy and the working alliance; b = the relation between the working alliance and symptom reduction; c = the total effect: the relation between outcome expectancy and symptom reduction; c' = the direct effect: the relation between outcome expectancy and symptom reduction while controlling for the working alliance. The indirect effect is calculated by a \times b or c − c'.

All mediation analyses with fear of negative evaluation as the outcome variable are presented in detail in Table 3.3. Results for mediation analyses with speaking confidence as the outcome variable are presented in Table 3.4. Analysis of the indirect effect revealed no
significant mediation of working alliance on the relation between outcome expectancy and fear of negative evaluation or speaking confidence at any time point.

Table 3.3 Bootstrapped Point Estimates and Bias-Corrected (BC) Confidence Intervals (CIs) for the Indirect Effects of Outcome Expectancy on Fear of Negative Evaluation.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Path</th>
<th>Normal Theory Tests</th>
<th>Bootstrap Results for Indirect Effects (BC; 95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Coefficient</td>
<td>SE</td>
</tr>
<tr>
<td>Session 4 Working Alliance</td>
<td>a</td>
<td>0.47</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>-0.40</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>Total (c)</td>
<td>0.00</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>Direct (c’)</td>
<td>0.23</td>
<td>0.28</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 8 Working Alliance</td>
<td>a</td>
<td>0.55</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>-0.06</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>Total (c)</td>
<td>-0.19</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>Direct (c’)</td>
<td>-0.15</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Working Alliance</td>
<td>a</td>
<td>0.22</td>
<td>0.28</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>0.03</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>Total (c)</td>
<td>-0.65</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>Direct (c’)</td>
<td>-0.66</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. a = the relation between outcome expectancy and the working alliance; b = the relation between the working alliance and fear of negative evaluation; c = the total effect: the relation between outcome expectancy and fear of negative evaluation; c’ = the direct effect: the relation between outcome expectancy and fear of negative evaluation while controlling for the working alliance.

Table 3.4 Bootstrapped Point Estimates and Bias-Corrected (BC) Confidence Intervals (CIs) for the Indirect Effects of Outcome Expectancy on Public Speaking Confidence.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Path</th>
<th>Normal Theory Tests</th>
<th>Bootstrap Results for Indirect Effects (BC; 95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Coefficient</td>
<td>SE</td>
</tr>
<tr>
<td>Session 4 Working Alliance</td>
<td>a</td>
<td>0.51</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>-0.22</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>Total (c)</td>
<td>-0.30</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>Direct (c’)</td>
<td>-0.19</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>0.57</td>
<td>0.25</td>
<td>2.33</td>
</tr>
</tbody>
</table>
### Table 3.5 Bootstrapped Point Estimates and Bias-Corrected (BC) Confidence Intervals (CIs) for the Indirect Effects of Outcome Expectancy on Fear of Negative Evaluation among Individuals in the EGT Condition.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Path</th>
<th>Coefficient</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>Point Estimate</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1 Working Alliance</td>
<td>a</td>
<td>1.16</td>
<td>0.45</td>
<td>2.59</td>
<td>0.01</td>
<td>-0.11</td>
<td>-0.95</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>-0.10</td>
<td>0.19</td>
<td>-0.50</td>
<td>0.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total (c)</td>
<td>-0.08</td>
<td>0.36</td>
<td>-0.23</td>
<td>0.82</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Direct (c')</td>
<td>0.03</td>
<td>0.43</td>
<td>0.07</td>
<td>0.95</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Of note, exposure treatments began during the 5th session for individuals assigned to the VRE condition, and the 2nd session for individuals assigned to the EGT condition. In light of this difference between conditions, additional mediational analyses were conducted within each treatment condition. Working alliance measured at session 1 was identified as the mediator for individuals in the EGT condition, and working alliance measured at session 4 was identified as the mediating variable for individuals in the VRE condition. Results of mediation analyses with fear of negative evaluation as the outcome variable are reported in Table 3.5 for the EGT group and Table 3.6 for the VRE group.
Note. \(a\) = the relation between outcome expectancy and the working alliance; \(b\) = the relation between the working alliance and fear of negative evaluation; \(c\) = the total effect: the relation between outcome expectancy and fear of negative evaluation; \(c'\) = the direct effect: the relation between outcome expectancy and fear of negative evaluation while controlling for the working alliance.

Table 3.6 Bootstrapped Point Estimates and Bias-Corrected (BC) Confidence Intervals (CIs) for the Indirect Effects of Outcome Expectancy on Fear of Negative Evaluation among Individuals in the VRE Condition.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Path</th>
<th>Coefficient</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>Point Estimate</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 4</td>
<td>Working Alliance</td>
<td>a</td>
<td>0.28</td>
<td>0.26</td>
<td>1.09</td>
<td>0.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b</td>
<td>-0.41</td>
<td>0.31</td>
<td>-1.34</td>
<td>0.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total (c)</td>
<td>0.03</td>
<td>0.39</td>
<td>0.08</td>
<td>0.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Direct (c')</td>
<td>0.15</td>
<td>0.39</td>
<td>0.38</td>
<td>0.71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of mediation analyses with speaking confidence as the outcome variable are reported in Table 3.7 for the EGT group and Table 3.8 for the VRE group. Again, no significant indirect effects were detected.

Table 3.7 Bootstrapped Point Estimates and Bias-Corrected (BC) Confidence Intervals (CIs) for the Indirect Effects of Outcome Expectancy on Public Speaking Confidence among Individuals in the EGT Condition.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Path</th>
<th>Coefficient</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>Point Estimate</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>Working Alliance</td>
<td>a</td>
<td>1.23</td>
<td>0.47</td>
<td>2.61</td>
<td>0.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b</td>
<td>0.14</td>
<td>0.17</td>
<td>0.81</td>
<td>0.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total (c)</td>
<td>-0.43</td>
<td>0.34</td>
<td>-1.27</td>
<td>0.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Direct (c')</td>
<td>-0.60</td>
<td>0.40</td>
<td>-1.50</td>
<td>0.15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. \(a\) = the relation between outcome expectancy and the working alliance; \(b\) = the relation between the working alliance and fear of negative evaluation; \(c\) = the total effect: the relation between outcome expectancy and fear of negative evaluation; \(c'\) = the direct effect: the relation between outcome expectancy and fear of negative evaluation while controlling for the working alliance.
Note. \( a \) = the relation between outcome expectancy and the working alliance; \( b \) = the relation between the working alliance and public speaking confidence; \( c \) = the total effect: the relation between outcome expectancy and public speaking confidence; \( c' \) = the direct effect: the relation between outcome expectancy and public speaking confidence while controlling for the working alliance.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Normal Theory Tests</th>
<th>Bootstrap Results for Indirect Effects (BC; 95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Path</td>
<td>Coefficient</td>
</tr>
<tr>
<td><strong>Session 4 Working Alliance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( a )</td>
<td></td>
<td>0.24</td>
</tr>
<tr>
<td>( b )</td>
<td></td>
<td>-0.32</td>
</tr>
<tr>
<td><strong>Total (( c ))</strong></td>
<td></td>
<td>-0.28</td>
</tr>
<tr>
<td><strong>Direct (( c' ))</strong></td>
<td></td>
<td>-0.20</td>
</tr>
</tbody>
</table>

Table 3.8 Bootstrapped Point Estimates and Bias-Corrected (BC) Confidence Intervals (CIs) for the Indirect Effects of Outcome Expectancy on Public Speaking Confidence among Individuals in the VRE Condition.

Note. \( a \) = the relation between outcome expectancy and the working alliance; \( b \) = the relation between the working alliance and public speaking confidence; \( c \) = the total effect: the relation between outcome expectancy and public speaking confidence; \( c' \) = the direct effect: the relation between outcome expectancy and public speaking confidence while controlling for the working alliance.

4 DISCUSSION

The purpose of the present study was to assess the relations among two common factors that reliably predict symptom reduction—outcome expectancy and working alliance—within the context of exposure-based treatments for social anxiety disorder. I predicted that the working alliance would mediate the relation between outcome expectancy and post-treatment symptoms of social anxiety. The results do not support my hypothesis. All analyses failed to detect an indirect effect of the working alliance on the relation between outcome expectancy and symptom reduction while controlling for pre-treatment symptoms. The null results were consistent across the type of exposure-based treatment (Exposure Group Therapy, Virtual Reality Exposure Therapy), the session at which working alliance was assessed (4, 8, averaged across sessions), and dependent variable (public speaking confidence, fear of negative evaluation).
Failing to find an indirect effect of working alliance on the relation between outcome expectancy and symptom reduction is inconsistent with previous literature, which generally supports the mediational role of the working alliance in the context of treatment for a variety of disorders using differing theoretical approaches (Abouguendia et al., 2004; Guadiano & Miller, 2006; Johansson et al., 2011; Joyce et al., 2003; Meyer et al., 2002). Further, the present study failed to detect any significant direct or total effects (path $c$ and $c'$ in Figure 1) or any relation between working alliance and symptom reduction (path $b$ in Figure 1). What follows is discussion of alternative explanations for null findings and of the potential implications of a null effect. Subsequently, limitations of the study and future directions for research will be described.

4.1 Outcome Expectancy and Symptom Reduction

The present analyses failed to detect any significant total or direct effects between outcome expectancy and symptom reduction (path $c$ and $c'$ in Figure 1). This is inconsistent with findings using data from the same parent study (Anderson et al., 2013) described by Price and Anderson (2012), who report a significant positive relation between outcome expectancy and the rate of change in symptom improvement. There are two important methodological differences between these studies that may explain the contradictory results: the difference in the measures used to assess symptoms and the difference in statistical methods applied.

First, the questionnaires used to measure symptoms of social anxiety in Price and Anderson (2012) differed from those used in the current study. Price and Anderson (2012) used the Personal Report of Communication Apprehension-Short Form (PRCA-SF; McCroskey, 1978), a measure of anxiety associated with public speaking, and the Self Statements during Public Speaking questionnaire (SSPS; Hofmann & DiBartolo, 2000), which measures fearful thoughts during public speaking. Given that public speaking fears were directly targeted in
treatment, outcome measures that assess anxiety related to public speaking, specifically, may be necessary to detect the total effect of outcome expectancy on symptom reduction. The present study used the FNE-B, which is a more general measure of symptoms that are not uniquely relevant to public speaking situations. The other measure used in the present study, the PRCS, does assess public speaking fears. However, the internal consistency of pre-treatment responses to the PRCS was poor at pre-treatment, which may have limited the ability to detect an effect using this measure. As such, the significant relation between outcome expectancy and symptom reduction reported by Price and Anderson (2012) may be due, in part, to the use of more internally consistent measures specific to public speaking fears. However, a meta-analysis of treatment outcomes for social anxiety disorder did not identify the type of questionnaire used as a significant moderator of the relation between public speaking anxiety treatment techniques and symptom reduction (Allen, Hunter, & Donohue, 1989). Thus, differences in outcome measures is an unlikely explanation for the discrepancy in findings between the current study and Price and Anderson (2012).

A second possible reason for these inconsistent results is the difference in analytical approaches. Mediational analyses conducted in the present investigation examined the effect of outcome expectancy on symptoms of social anxiety that were measured at a single time point (post-treatment) while controlling for baseline symptom severity. In contrast, Price and Anderson (2012) used a statistical approach, MLM, which measures the rate of change over the course of multiple time points. More specifically, MLM may reveal the overall magnitude of change from pre-treatment to post-treatment by measuring how quickly symptoms improve throughout treatment (Price et al., 2008). Measurement of the rate of change over time is more congruent with gradual improvement typically observed in therapy (Price et al., 2008).
Regression analysis, in contrast, is limited to assessment of discrete change from two time-points. Therefore, Price and Anderson’s (2012) use of MLM may have allowed for a more nuanced assessment of the relation between outcome expectancy and symptom reduction.

4.2 Working Alliance and Symptom Reduction

Mediational analyses also failed to detect significant relations between the working alliance and symptom reduction, which corresponds with path b (see Figure 3.1). The insignificant relations between the working alliance and symptom reduction are inconsistent with the broader literature on the working alliance. Meta-analytic research demonstrates a robust relation between the working alliance and treatment outcome following treatments based on a variety of theoretical orientations addressing a myriad of psychological disorders and concerns (Horvath et al., 2011). Some possible interpretations of the pattern of null findings in the present study include measurement error, potential treatment group differences in WAI-SF scores, the argument that the working alliance may represent an outcome variable rather than a predictor variable (Feeley, DeRubeis, & Gelfand, 1999), and observations that the working alliance may more accurately predict improvements in general functioning rather than specific symptoms (Busseri & Tyler, 2003). These interpretations are discussed below.

In the face of null findings that are inconsistent with prior literature it is natural to consider the extent to which measurement issues may be at play. The present study utilized the WAI-SF (Tracey & Kokotovic, 1989), which is a widely used measure with known psychometric properties, to measure the working alliance. The internal consistency of the WAI-SF in the present study was good across time points. There was also variability in alliance scores throughout treatment, making restriction of range an unlikely explanation for our null findings. Similarly, the outcome measures used in the present study- the PRCS and the FNE-B- are also
validated measures with known psychometric properties (Klorman, et al., 1974; Leary, 1983) that demonstrated good variability and internal consistency at post-treatment. All other studies examining the relation between the working alliance and symptom reduction in treatment for social phobia have also used validated measures with known psychometric properties (Andersson et al., 2012; Mörtberg, 2014; Woody & Adessky, 2003). Taken together, these points suggest that measurement error is an unlikely explanation for the present study’s null findings.

The WAI as a measure of alliance may not have been relevant to participants who were randomly allocated to the EGT condition. The WAI was designed for an individual rather than a group treatment format (Horvath & Greenberg, 1989). As such, participants in the EGT condition may have derived a stronger sense of group cohesion rather than alliance to a specific therapist (Burlingame, Fuhriman, & Johnson, 2002). However, no significant differences between treatment groups were detected in overall working alliance scores in the present study. Further, the mediational analyses conducted separately for each treatment yielded the same pattern of null findings. Therefore, the presence of group differences in the applicability of the WAI is an unlikely explanation for null effects.

Another possible explanation for insignificant relations between working alliance and symptom reduction suggested by others is that the working alliance may more appropriately be conceptualized as an outcome measure for treatment of depression. (Feeley et al., 1999). In treatment for social phobia, improving the client’s ability to develop and maintain interpersonal relationships is commonly a therapeutic target. Developing a working alliance with a therapist is an example of developing and maintaining interpersonal relations. As such, the working alliance may more appropriately serve as an outcome variable rather than a mediator of symptom reduction. We would expect, however, that scores on the WAI in the current study would
correlate with other outcome measures that were assessed (fear of negative evaluation and speaking confidence; see Table 2). A general lack of correlation among these measures limits the likelihood that the working alliance is more appropriately conceptualized as an outcome measure (or dependent variable) in the present study.

Investigations of the relation between working alliance and treatment response across disorders have produced the observation that the WAI may more accurately predict general improvement scores rather than symptom-specific measures of outcome (Busseri & Tyler, 2003). Busseri and Tyler (2003) cite several instances in which the WAI predicted general improvement ratings but did not predict symptom reduction. Notably, several studies reporting a significant indirect effect of the working alliance on the relation between outcome expectancy and treatment response utilized general outcome measures including residual gain scores of improvement ratings and the Global Assessment of Functioning scale (Joyce et al., 2003; Johansson et al., 2011). Other studies used composites of symptom measures (Meyer et al., 2002; Abouguendia et al., 2004). As such, the present study’s symptom measures may have been too specific and therefore failed to capture the general improvement that results from positive outcome expectancy via the working alliance, resulting in null findings.

Alternatively, the present study’s null findings may reflect that there is not, in fact, a significant relation between the working alliance and symptom reduction among individuals receiving treatment for social anxiety disorder. In support of this conclusion, the present null findings are consistent with all other known investigations of the alliance following a variety of cognitive-behavioral treatments for social phobia (Andersson et al., 2012; Mörtberg, 2014; Woody & Adessky, 2003). This accumulation of evidence suggests that treatment for social
anxiety disorder may represent a unique context in which the working alliance is unrelated to symptom change relative to treatments for other disorders.

### 4.3 Unique Mechanisms in Treatment for Social Anxiety Disorder

By its nature, treatment for social phobia may represent a distinct context in which the working alliance is unrelated to therapeutic change. For example, social anxiety is associated with increased fear of expressing strong emotions, increased desire to avoid conflict, increased conflict avoidance, decreased assertiveness, increased over-reliance on others, and increased fear of rejection (Davila & Beck, 2002). Social anxiety has also been shown to have a negative impact on interpersonal communication and interaction, including reduced conversational interruptions (Natale, Entin, & Jaffe, 1979), generation and expression of fewer ideas (Camacho & Paulus, 1995), more variability in interpersonal behaviors (Rappaport, Moskowitz, & D’Antono, 2014), and limited vulnerability and intimacy in conversation (Alden & Taylor, 2004). As such, the working alliance may not represent an effective mechanism of therapeutic change among individuals with clinically significant symptoms of social anxiety. These unique qualities associated with the treatment of social phobia suggest that the relevance of common factors may vary by disorder.

If future research supports the conclusion that the working alliance is unrelated to outcome in treatment for social anxiety disorder, this finding could have broad implications for the field of common factors. A debate within this field revolves around the assertion that common factors are wholly responsible for therapeutic change instead of the unique theoretical content, or special ingredients, of treatments (Constantino et al., 2012; Imel & Wampold, 2008; Messer & Wampold, 2002; Wampold, 2001). This interpretation is known as the common factors view, and it relies on the assumption that common factors predict therapeutic improvement
consistently across all treatments for all disorders (Imel & Wampold, 2008; Messer & Wampold, 2002). Convergent evidence from the present study in combination with all other known investigations of the relation between the working alliance and symptoms of social anxiety suggest that the working alliance violates this assumption. Exceptions such as this to the widespread effect of common factors on treatment response threaten the parsimony of the common factors view. Meta-analytic evidence reported by Marcus, O’Connell, Norris, and Sawaqdeh (2014) also calls the common factors view into question. The authors demonstrated that cognitive behavioral therapy may be more effective than alternative treatments over and above common factor variables in some circumstances, including treatments for anxiety ($d = .43$). Taken together, these findings are incompatible with the theoretical framework for the common factors view, which threatens the integrity of the nomological network. The nomological network is conceptualized as a network of evidence that supports interconnections between a construct’s theoretical and empirical frameworks (Cronbach & Meehl, 1955). Inconsistencies between the theoretical and empirical frameworks of the common factors view suggest that proponents of this viewpoint may be faced with the need to reconsider the theoretical framework and the operationalization of common factors in order to be compatible with context-dependent variability.

### 4.4 Limitations and Future Directions

The current study has several limitations. First, all variables of interest were operationalized by self-report measures collected from a single source: the participant. Consistency among results collected from multiple informants and behavioral or biological measures of treatment response would increase confidence in the present findings. A second limitation of note is the relatively small sample size ($n = 65$) in the present study. This sample
size would be insufficient to detect a significant indirect effect of the working alliance on the relation between outcome expectancy and symptom reduction if the relation between the alliance and symptoms is small (Fritz & MacKinnon, 2007). Third, a comparison group was not included in the present study’s analyses. As such, we were unable to explore the possibility that the present study’s null findings are unique to treatment for social anxiety disorder relative to treatment for other disorders. Finally, neither outcome expectancy nor working alliance were manipulated in the present study. This precludes the ability to infer cause among the relations between outcome expectancy, working alliance, and symptom reduction.

Despite these limitations, the current study is one among very few to investigate the mechanisms by which common factors influence treatment response, and the first to do so in a sample of adults receiving treatment for social phobia. Relative to other studies investigating the mediational role of the working alliance on the relation between outcome expectancy and treatment response (Abouguendia, et al., 2004; Johansson et al., 2011; Joyce et al., 2003; Meyer et al., 2002), the present study is the only one to exclusively use measures with known psychometric properties, and is the only study to use bootstrapping techniques to estimate the indirect effect of the working alliance. It is also the first study to examine the relation between working alliance and symptom reduction following virtual reality exposure therapy. These contributions to the literature emphasize the need for further exploration of the mechanisms by which common factors relate to treatment response, particularly in unique contexts that may influence the relevance of common factors such as novel technology-based interventions (Kazdin, 2005) and treatment for social anxiety.

It is important to note that a null result, or even a collection of studies reporting null results, is not a guarantee that an effect is absent. Low power is a pervasive problem in social
sciences research (Cohen, 1962; Sedlmeier & Gigerenzer, 1989; Rossi, 1990), and the present study is no exception. The sample sizes reported in previous reports examining the relation between the working alliance and symptom reduction among individuals receiving treatment for social phobia were 90, 54, and 53, respectively. It is therefore likely that these studies would have been underpowered to detect a small effect, if present (Field, 2013). Additional research is necessary to determine whether or not the working alliance is related to symptom reduction in treatment for social anxiety disorder. Regardless of whether this relation is small or nonexistent, the accumulation of null findings could suggest that the working alliance is not as relevant for therapeutic change compared to other common factors variables in the context of treatment for social phobia.

As such, future research is needed to explore several possible mechanisms of action other than the working alliance for the effect of outcome expectancy on symptom reduction following treatment for social anxiety disorder. For instance, Meyer and colleagues’ (2002) theoretical justification for the mediational role of the alliance was based on goal theory (Austin & Vancouver, 1996; Carver & Scheier, 1998). According to this model, positive outcome expectancies are associated with the belief that therapeutic improvement can realistically be achieved, which will promote the amount of effort the client dedicates to therapy. This increased effort, in turn, is what contributes to better outcomes. Though the working alliance may be one way to capture this enhanced effort (the client is more reliable, willing to take risks, and willing to trust the therapist which enhances the relationship), there may be other ways to more directly operationalize effort. Homework compliance is one example. Clients who complete homework assignments between sessions are more likely to respond to treatment (Persons, Burns, & Perloff, 1988). The effort required to complete homework may be facilitated by increased motivation that
derives from the belief that the treatment will be effective. In support of this hypothesis, prior work has identified homework compliance as a significant mediator of the relation between outcome expectancy and treatment response following CBT treatment for anxiety (including panic disorder, social phobia, and generalized anxiety disorder; Westra, Dozois, & Marcus, 2007).

Future research is also needed to investigate the possibility that the mechanisms by which common factors variables relate to treatment response differ across disorders. Treatments for social anxiety disorder may be adapted and enhanced based on knowledge of which common factors have the most impact on symptom reduction, and how these effects are achieved. In addition, assessment of the most relevant common factors variables can be used to identify those who are more likely to benefit from certain types of treatment. For example, individuals with optimistic expectations about the effectiveness of treatment for social phobia may be more likely to benefit from treatment. Those with pessimistic expectations, on the other hand, may require interventions designed to prepare them for treatment, may need to spend more time in therapy to achieve the same level of benefit, or may be better suited to other forms of intervention such as medication.

In sum, the present study investigated the hypothesis that the working alliance mediates the relation between outcome expectancy and symptom reduction in exposure-based treatment for social anxiety. No indirect, direct, or total effects were detected. The null indirect effect is inconsistent with previous reports supporting the mediational role of the alliance on the relation between outcome expectancy and treatment response (Abouguendia, et al., 2004; Johansson et al., 2011; Joyce et al., 2003; Meyer et al., 2002). Further, the null relation between the working alliance and symptom reduction is inconsistent with meta-analytic evaluations of this relation.
(Horvath et al., 2011). However, all other studies that have examined the relation between the working alliance and symptom reduction among individuals with social anxiety disorder have also reported null effects (Andersson et al., 2012; Mörtberg, 2014; Woody & Adessky, 2003). These null findings suggest the possibility that the mechanisms of common factors may not be common across treatment settings. In particular, the role of the working alliance may be unique within the context of treatment for social anxiety. As such, future research investigating the mechanisms of action of common factors in treatment is needed to improve the acceptability, dissemination, and efficacy of therapeutic interventions.
REFERENCES


APPENDICES

Appendix A: Self Report Measures

Appendix A.1: Credibility/Expectancy Questionnaire

EXPECTANCY OF THERAPEUTIC OUTCOME QUESTIONNAIRE

Client Number: _______________     Date: _______________

Directions: Please use the scale below to answer the following questions by filling in the bubble next to the number that best represents your feelings about the treatment program.

<table>
<thead>
<tr>
<th>Extremely</th>
<th>Moderately</th>
<th>Somewhat</th>
<th>Very Little</th>
<th>Not at All</th>
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<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
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1. How logical does this type of treatment seem to you?

2. How confident are you that this treatment will be successful in reducing your fear of public speaking symptoms?

3. How confident are you that this treatment will be successful in reducing other personal problems?

4. How confident would you be in recommending this treatment to a friend with similar problems?
Appendix A.2: Working Alliance Inventory-Short Form

请根据以下问题使用下表中的尺度，选择最能代表您感受的选项。

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<tr>
<td></td>
<td>Not at all</td>
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<td>Very Much</td>
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1. 我相信我们用我的问题解决方法是正确的。
2. 我们一致认为对我的工作态度很重要。
3. 我的治疗师和我同意采取的措施可以帮助改善我的情况。
4. 我在治疗中获得的新方法使我更好地看待我的问题。
5. 我相信我的治疗师喜欢我。
6. 我对我治疗师的能力感到自信。
7. 我感到我的治疗师很欣赏我。
8. 我的治疗师和我相互信任。
9. 我的治疗师没有理解我想要完成的治疗。
10. 我的治疗师和我在达成共同目标方面存在分歧。
11. 我的治疗师和我有不同的看法。
12. 我们已经充分理解对我的改变将会让我好起来。
Appendix A.3: Personal Report of Confidence as a Speaker

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# Appendix A.4: Fear of Negative Evaluation-Brief Form

**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 (fill in the bubble that corresponds with your answer).

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</thead>
<tbody>
<tr>
<td></td>
<td>Not at All</td>
<td>Slightly</td>
<td>Moderately</td>
<td>Very</td>
<td>Extremely</td>
</tr>
</tbody>
</table>

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.