Chapter 23

Treatment of Adult Social Anxiety Disorder: A Treatments-by-Dimensions Review

Kristin N. Anderson and Debra A. Hope
Department of Psychology, University of Nebraska-Lincoln, Lincoln, NE

In the past 30 years, there has been considerable research on the treatment of social anxiety disorder (SAD). At this writing, there are more than 50 studies evaluating psychosocial interventions with adults who meet standard criteria for SAD in the DSM (American Psychiatric Association, 1980, 1987, 1994, 2000, 2013). Over the years, numerous conceptual reviews of this literature have been published (Dalrymple, 2012; Heimberg, Dodge, & Becker, 1987; Rodebaugh, Holaway, & Heimberg, 2004). In addition, several meta-analyses have appeared, which convincingly establish the effectiveness of psychosocial treatments for SAD (e.g., Acarturk, Cuijpers, van Straten, & de Graaf, 2009; Canton, Scott, & Glue, 2012; Feske & Chambless, 1995; Gould, Buckminster, Pollack, Otto, & Yap, 1997; Powers, Sigmarsson, & Emmelkamp, 2008). Many of these previous conceptual and meta-analytic reviews have investigated whether one particular psychosocial treatment for SAD may be more effective than the others. However, few have examined whether these various treatments may have different effects depending on the outcome measure employed (see Feske & Chambless, 1995, & Gould et al., 1997, for exceptions). Instead, most prior analyses have relied on global measures of social anxiety severity (e.g., Canton et al., 2012; Fedoroff & Taylor, 2001; Gil, Carrillo, & Meca, 2001).

Nevertheless, researchers include multiple measures of outcome in individual studies precisely because they recognize that SAD is a complex phenomenon. An individual presenting with this disorder may show a number of symptoms, including heightened physiological arousal, excessive negative beliefs and self-statements, biases in judgment and attention, fear of negative evaluation, behavioral avoidance, and deficits in social performance or skill. One or more of these may be prominent in a given case. Unfortunately, specifically which of

Social Anxiety. DOI: 10.1016/B978-0-12-394427-6.00023-6

these potential symptoms of social anxiety change in response to various treatments remains largely unknown. Recognition of this limitation led us to take a new approach to reviewing the treatment literature in the first and second editions of this volume, now updated and expanded for the third edition. This review will be organized around specific aspects of SAD, evaluating which treatments may address which symptoms most effectively. We hope this will meet two goals. Firstly, a practitioner may use this review as a guide in treatment selection if a client presents with a particular dominant symptom cluster. Secondly, it is hoped that such a review will help elucidate the mechanisms underlying the best treatments, as well as identify which are broadly effective across many types of symptoms. A few recent studies have directly investigated treatment mechanisms, which will be used to inform this discussion where relevant. It should be noted that not all studies that evaluated a psychosocial treatment for SAD will be reviewed because some studies did not utilize any of the outcome measures we examined. Instead, these studies relied primarily on clinician ratings and general self-report of symptoms.

TREATMENT IMPACT ON PHYSIOLOGICAL SYMPTOMS AND NEUROLOGICAL ACTIVITY

A number of studies have included assessment of a physiological component of social anxiety in the design. Most often, researchers have assessed heart rate and, less frequently, blood pressure or skin conductance reactivity. More recently, researchers have also begun to assess changes in neurological activity following social anxiety treatment. Physiological measures are usually taken during or in anticipation of a behavioral test such as a brief speech or interaction task. Although many studies have found little change on physiological measures (e.g., Clark & Agras, 1991; Falloon, Lloyd & Harpin, 1981), a few studies have found within-group changes or between-group differences using inactive controls, but often no difference between various active treatments.

In the pilot study of cognitive behavioral group therapy (CBGT) consisting of integrated exposure and cognitive restructuring for SAD (Heimberg, Becker, Goldfinger & Vermilyea 1985), seven individuals were treated in a multiple baseline design and had significant reductions in heart rate during a role-played individualized behavioral test. The reductions were evident both during an anticipatory period and during the role-play, and they tended to be maintained at six-month follow-up. In their comparison of CBGT and educational-supportive therapy (ES; a credible placebo control), Heimberg et al. (1990) again measured heart rate in anticipation of and during an individualized behavioral test conducted in the laboratory at pre-treatment, post-treatment, and at the six-month follow-up. Although there was no between-group difference, both treatment groups had significant reductions in heart rate at post-treatment in the range of 8–11 beats per minute (bpm). In contrast to other measures that favored CBGT at six-month follow-up, the reduction in heart rate for the ES participants only

continued to be significant when compared with pre-treatment measures. Unfortunately, heart rate data were not collected in the five-year follow-up study of these participants (Heimberg, Salzman, Holt & Blendell, 1993), so it is unknown whether this pattern of results was maintained.

When CBGT was compared with exposure alone in a treatment dismantling study, heart rate in anticipation of and during the individualized behavioral test improved significantly from pre- to posttreatment, with no differences between treatments (Hope, Heimberg, & Bruch, 1995). These results were generally maintained at six-month follow-up.

Both blood pressure and heart rate were measured before and after treatment in the pilot study for social effectiveness therapy (SET), a multicomponent treatment that includes education, social skills training, individualized flooding, and homework (Turner, Beidel, Cooley, Woody, & Messer, 1994). The physiological measures were taken at two-minute intervals during a baseline period and during a speech challenge test. Despite evidence of improvement on other measures, the only significant physiological change was a decrease in diastolic blood pressure during the baseline period. Although physiological reactivity was apparently also monitored within treatment sessions, these data were not reported. However, Fink, Turner and Beidel (1996) included a graph of in-session heart rate during imaginal exposure as part of SET for a single-subject study that included incorporation of culturally relevant factors in the treatment of an African American woman. The graph showed an across-session habituation curve, suggesting improvement in heart rate reactivity with SET.

Overall, very few researchers have reported that different treatments yield *differential* change on cardiac reactivity in response to a behavioral challenge. However, Emmelkamp, Mersch, Vissia and van der Helm (1985) found such a difference in their comparison of in vivo exposure, rational emotive therapy, and self-instructional training (self-instructions and imaginal rehearsal of social situations). Heart rate was measured during two separate interactions with a male or a female confederate at a one-minute baseline, in anticipation of the interaction, and immediately after the interaction. Surprisingly, there were no significant decreases in heart rate within the treatment groups at the completion of treatment. However, between-group comparisons at post-treatment, controlling for pre-treatment heart rate, revealed that heart rate in anticipation of interactions and immediately after the interactions was more reduced for those participants in the exposure condition compared with the cognitive treatments combined. It does not appear that heart rate was assessed at the one-month follow-up assessment, and thus it is unknown whether these differences were maintained.

Recognizing the heterogeneity of the presentation of social anxiety disorder, Öst and colleagues (Jerremalm, Jansson, & Öst, 1986; Öst, Jerremalm, & Johanssan, 1981) investigated whether matching the type of treatment to socially anxious participants' reaction patterns may yield a better outcome. Participants were classified as physiological reactors, behavioral reactors, or cognitive reactors on the basis of their pattern of response to a role-played social interaction.

Physiological reactors were expected to have a greater reduction in physiological symptoms with applied relaxation compared with social skills training or self-instructional training. In contrast, socially anxious participants who were determined to be more reactive in a behavioral or cognitive sense should benefit more from social skills training or self-instructional training, respectively. Compared with pre-treatment, physiological reactors, regardless of whether they received applied relaxation, social skills training, or self-instructional training, had lower heart rates (or less heart rate reactivity from baseline) at post-treatment. Neither behavioral nor cognitive reactors demonstrated change in heart rate regardless of treatment condition. The lack of change for these participants who met criteria for SAD may be attributable to floor effects, because they were initially selected as having minimal elevations in heart rate during the behavioral test. Physiological reactors assigned to a wait-list condition did not improve on heart rate, suggesting the change was not attributable to spontaneous recovery or repeated assessment.

It should be noted that the classification of physiological, behavioral, and cognitive reactors was somewhat unstable in these examinations. Also, individuals who fell between the categories, such as being moderately elevated on both physiological and cognitive indices, were excluded from these studies. However, it does appear that socially anxious participants with strong cardiac reactions to socially threatening situations will likely experience a decrease in their heart rate reactivity with either applied relaxation that targets autonomic arousal directly, or social skill or cognitive intervention.

No changes in cardiac reactions were noted after treatment for SAD in some studies. Falloon and colleagues (1981) found no habituation of heart rate from the first to the last exposure session with either role-played or in vivo exposure for socially anxious individuals also taking propanolol or pill placebo. Clark and Agras (1991) measured heart rate during a speech and musical performance among musicians seeking treatment for performance anxiety who also met criteria for SAD. Overall, heart rate did not change significantly from pre- to post-treatment, nor were there differences among the cognitive-behavioral, buspirone, or placebo treatments. The cognitive-behavioral treatment consisted of self-statement modification, applied relaxation, and exposure.

Physiological changes after treatment for SAD that conflicted with predicted outcomes were noted in one study. Mathewson and colleagues (2013) found that resting respiratory sinus arrhythmia (RSA), an index of vagal cardiac control, declined over the course of CBGT. However, it had been hypothesized that resting RSA would increase with treatment, since higher levels of resting RSA are thought to reflect greater capacity for physiological self-regulation. Nevertheless, the authors noted that these unexpected results may have been a function of the demands of the testing sessions, in that RSA was measured during anticipation of a speech task and moderate RSA withdrawal may be an adaptive physiological response in preparation for an expected stressor (Mathewson et al., 2013).

One recent study utilized skin conductance reactivity (SCR), rather than heart rate or blood pressure, as an index of physiological changes in response to attention training (Heeren, Reese, McNally, & Philippot, 2012). Attention training treats SAD by directly altering clients' attention to threat, utilizing a modified dot-probe task presented via computer (MacLeod, Mathews, & Tata, 1986). In this task, a fixation point is followed by a pair of faces (one threatening and one positive or neutral), one of which is subsequently replaced by a probe that participants are required to identify. In this study, participants were randomly assigned to one of three attention-training programs: a condition where the probe appeared with 80% frequency in the location of the positive face (AP), a condition where the probe appeared with 80% frequency in the location of the threatening face (AT), and a control condition where the probe was equally likely to appear in the location of either face (Heeren et al., 2012). At baseline and after four sessions of attention-training, SCR was measured during a two-minute anticipatory period before a speech task. AP participants experienced a significant decrease in SCR from baseline to post-treatment and demonstrated significantly less SCR at post-treatment than AT participants or controls, who experienced no change from baseline (Heeren et al., 2012). Furthermore, this change in SCR was mediated by a change in attentional bias for threat.

Three published papers, including two from the Mathewson and colleagues (2013) study of RSA discussed above, have examined neurological changes following psychosocial treatment. Based on previous research showing an association between greater delta-beta coupling and anxiety-related situations (Miskovic et al., 2010) and traits (i.e., behavioral inhibition; van Peer, Roelofs, & Spinhoven, 2008), Miskovic and colleagues (2011) hypothesized and found a significant decrease in delta-beta coupling from pre-treatment to post-treatment. This reduction in delta-beta coupling was found for both the rest period and anticipatory period before a speech task and was particularly evident in the frontocentral cortex. In addition, participants with SAD demonstrated greater delta-beta coupling than non-clinical controls with low social anxiety prior to CBGT, but showed no difference from controls after CBGT (Miskovic et al., 2011). Moscovitch and colleagues (2011) also examined EEG activity in this treatment sample, but focused on frontal EEG asymmetry. Greater EEG activity in the right frontal lobe relative to the left has consistently been associated with heightened psychopathology, including social anxiety (e.g., Davidson, Marshall, Tomarken, & Henriques, 2000). Supporting their hypotheses, participants showed a change from relatively greater right to left frontal EEG asymmetry following CBGT (Moscovitch et al., 2011).

Finally, in a separate study of neurological changes following treatment for SAD, participants were randomly assigned to CBGT, citalopram, or wait list control (WLC) (Furmark et al., 2002). Before and after treatment, Positron Emission Tomography (PET) scanning was conducted during a video-recorded speech task with an audience gathered around the scanner. Among participants who received CBGT, blood flow decreased in the amygdala, hippocampus,

and anterior and medial temporal cortex over the course of treatment (Furmark et al., 2002). Amygdalohippocampal activity is associated with fear reactions and consolidation of traumatic memories. Thus, the symptom change observed in these treatment responders is thought perhaps to result from habituation of neurological activity in these areas of the brain through exposure. Although CBGT and citalopram both resulted in significantly greater neurological changes than WLC, the only difference between CBGT and citalopram was a greater increase in blood flow to the right thalamus following citalopram (Furmark et al., 2002).

In summary, reductions in physiological response, particularly heart rate, were noted with CBGT, exposure alone, and ES. For socially anxious participants who can be classified as physiological reactors, applied relaxation, social skills training, and self-instructional training also yielded reductions in heart rate. There is less evidence for SET resulting in changes in physiological responding, but given that the package includes exposure and social skills training, future research may support efficacy in this area. Purely cognitive interventions may be less likely to reduce heart rates in socially threatening situations, because Emmelkamp et al. (1985) found exposure to be more effective than rational emotive therapy and self-instructional training. However, for physiological reactors, even a purely cognitive treatment appears to be effective in reducing heart rate. In addition, an even narrower cognitive intervention focused solely on modifying attention seems effective in reducing skin conductance reactivity. Aside from this study of attention training, it is worth noting that most recent treatment studies have not used physiological assessments to measure outcome. Thus, it is unknown how other more recent iterations of treatments (e.g., Hope, Heimberg, Juster, & Turk, 2000) affect physiological responses. On the other hand, recent research has increasingly incorporated neurological assessments. Although most neurological research thus far has focused on pharmacological interventions, data from both EEG and PET demonstrate substantial changes in brain activity following CBGT. The exact meaning of these changes awaits further research.

Some methodological issues are worth noting. Most of the studies utilized only heart rate as a physiological index. Turner and colleagues also included blood pressure, with limited results (Turner, Beidel, Cooley, et al., 1994), and one study utilized skin conductance (Heeren et al., 2012). However, other measures such as blood flow activity/skin temperature changes (blushing) or muscle tension may yield different results. Furthermore, while all of the studies assessed physiological response to a behavioral challenge, there were a variety of procedural variations (e.g., measurement during anticipatory period versus during task, speech task versus interaction) that make comparison among studies more difficult. Interestingly, there may be some utility to determining an individual's tendency to react physiologically or neurologically to various stimuli. Although the treatment-matching hypotheses of Öst and his colleagues (1981) were not consistently confirmed, the physiological reactors demonstrated

consistently reduced heart rates after treatment. In addition, Hofmann (2013) found that pre-treatment neurological reactions to threatening and neutral faces can predict treatment response on other outcome measures. Nevertheless, future treatment studies using neurological outcome measures should examine other psychosocial interventions besides CBGT and need to utilize control conditions more consistently.

TREATMENT IMPACT ON COGNITIVE SYMPTOMS

The interest in cognitive-behavioral treatment for SAD has been accompanied by an effort to measure cognitive change in many studies. However, cognition can be examined in various ways that actually assess several different cognitive symptoms of SAD. Firstly, compared to non-anxious adults, individuals with SAD tend to report a greater number of negative cognitions (Dodge, Hope, Heimberg, & Becker, 1988), which range from the level of self-statements and automatic thoughts to that of schemas and core beliefs. Secondly, individuals with SAD also tend to exhibit biased judgments, including misinterpretation of ambiguous social stimuli (Amir & Taylor, 2012) and exaggeration of negative outcomes (Foa, Franklin, Perry, & Herbert, 1996). Finally, biases in attention to threat are also common among people with SAD. Thus, this review of treatment impact on cognitive symptoms will be divided into three sections: (1) beliefs and self-statements; (2) judgment and interpretation-biases; and (3) attentional processes.

Beliefs and Self-Statements

Beliefs

In the 1970s through the 1990s, many studies investigating treatment of SAD utilized a measure of Ellis' (1962) irrational beliefs, such as the Irrational Beliefs Test (IBT; Jones, 1969), the Rational Behavior Inventory (RBI; Shorkey & Whiteman, 1977), or the Irrational Beliefs Inventory (IBI; Koopmans, Sanderman, Timmerman & Emmelkamp, 1994). Consistent with what one might expect, a comparison of exposure alone, rational-emotive therapy, and self-instructional training revealed that only the two cognitive treatments (RET and SIT) resulted in change on the IBT (Emmelkamp et al., 1985). However, three studies found exposure and social skills training both showed similar improvements on the IBT whether or not they included a cognitive component (Mattick & Peters, 1988; Mattick, Peters, & Clarke, 1989; Stravynski, Marks, & Yule, 1982). Mersch, Emmelkamp, Bögels, and van der Sleen (1989) obtained similar results using the RBI. Between pre-treatment and post-treatment, RBI scores significantly improved among the individuals with SAD classified as cognitive reactors in both the behavioral (social skills training) and cognitive (RET) treatments, but not among the behavioral reactors in either treatment. Nevertheless, these data are difficult to interpret because cognitive reactors were

initially categorized on the bases of extreme score on the RBI, so regression to the mean may explain apparent improvement among cognitive reactors in both cognitive and non-cognitive treatments. Finally, other studies have found only modest improvements in irrational beliefs or have failed to find differences between the active treatments and wait-list controls (Heimberg et al., 1985; Mattick et al., 1989; Mersch, 1995; Mersch, Jansen, & Arntz, 1995). Furthermore, none of the previously described irrational belief measures are specific to social anxiety; instead, they assess more general features of psychopathology.

Possibly due to this lack of specificity to social anxiety, more recent research studies have employed alternative measures of beliefs. Indeed, several studies have utilized measures of schemas and core beliefs with items that reflect concerns which are often central to individuals with SAD (e.g., "I don't fit in," "I am unlovable," and "If people could see who I really am, they would reject me") (Boden et al., 2012; Rapee, Gaston, & Abbott, 2009). Three studies have used the Social Attitudes Questionnaire (SAQ; Clark, Wells, Hackman, Butler, & Fennell, 1994), two have used the short version of the Young Schema Questionnaire (YSQ; Stopa, Thorne, Waters, & Preston, 2001), and two have used their own, self-created belief measures (Boden et al., 2012; Rapee et al., 2009). These studies will be reviewed next.

As in the previously reviewed studies of non-specific irrational beliefs, Borge and colleagues (Borge et al., 2008; Borge, Hoffart, & Sexton, 2010) compared the effects of a cognitive and non-cognitive treatment on schemas among inpatient clients with SAD. In a comparison of residential cognitive therapy and residential interpersonal therapy, individuals in both conditions showed substantial improvement on the YSQ from pre-treatment to post-treatment and from post-treatment to one-year follow-up. Borge and colleagues (2008) also found significant improvement on four items of the SAQ selected to reflect a defective self-view at post-treatment and follow-up. No significant between-group differences were found on either the YSQ or SAQ items. However, there was a trend for cognitive therapy to have larger effects on the SAQ than interpersonal therapy (Borge et al., 2008). In addition, greater pre-treatment cognitive dysfunction, as measured by the YSQ and SAQ, predicted poorer treatment outcomes for interpersonal therapy, but made no difference in treatment effects of cognitive therapy (Borge et al., 2010). Thus, although both the cognitive and non-cognitive treatment appear effective for addressing SA-related schemas, cognitive therapy may be more beneficial for clients presenting with greater initial dysfunction.

Unlike the previously reviewed studies, Mortberg, Clark, Sundin, and Wistedt (2007) compared two cognitive treatments—individual cognitive therapy and intensive group cognitive therapy (IGCT)—to treatment-as-usual (TAU; pharmacotherapy). Individual cognitive therapy followed the model of Clark and Wells (1995) over the course of 16 weeks, while intensive group cognitive therapy incorporated psychoeducation and applied relaxation along with cognitive material over the course of three weeks. At four months, eight

months, and 12 months, SAQ scores had decreased from pre-treatment for all three treatments. Nevertheless, participants in individual cognitive therapy demonstrated greater improvement in SAQ scores than those in intensive group cognitive therapy or TAU (Mortberg et al., 2007). Unfortunately, no data on the SAQ were reported in the five-year follow-up (Mortberg, Clark, & Berjerot, 2011).

Similarly, Rapee, Gaston, and Abbott (2009) compared the effects of standard and "enhanced" cognitive-behavioral therapy on core beliefs of socially anxious clients, using stress management as a credible control condition. In this study, standard CBT involved only cognitive restructuring for automatic thoughts and in vivo exposure, whereas "enhanced" CBT also incorporated greater evidence-gathering related to underlying schemas, feedback on performance, elimination of safety behaviors, and exercises to focus attention away from the self. Using their own measure of core beliefs, Rapee and colleagues found improved scores at post-treatment for all conditions. No differences between standard CBT, "enhanced" CBT, and stress management emerged (Rapee et al., 2009).

Boden and colleagues (2012) also developed their own measure of SA-related beliefs using clinical experience, consultation with experts in the field, and a literature review. They then tested this measure, the Maladaptive Interpersonal Belief Scale (MIBS), as part of a larger study examining neurological effects of individual CBT. Collapsing across those in immediate and delayed treatment, 83% of participants who completed the MIBS showed a significant decrease in maladaptive beliefs from baseline to post-treatment. In addition, these changes in maladaptive beliefs strongly mediated the effect of group (immediate treatment versus wait-list) on changes in social anxiety symptoms.

Finally, Bogels (2006) examined more specific negative beliefs, or automatic thoughts, about showing physical symptoms using the Blushing, Sweating, Trembling, and Freezing Questionnaire (BTS-Q; Bogels & Reith, 1999). Socially anxious clients with primary concerns related to physical symptoms were randomly assigned to task concentration training or applied relaxation followed by cognitive therapy for everyone. Task concentration training focuses on learning to redirect attention away from oneself and one's physical symptoms toward the tasks of the situation. Bogels (2006) found greater changes on the negative beliefs subscale of the BTS-Q following treatment with task concentration training compared to applied relaxation. Furthermore, although the addition of cognitive therapy seemed to negate the between-group differences at post-treatment and three-month follow-up, the combination of task concentration training and cognitive therapy did show larger reductions in negative beliefs at the one-year follow-up than applied relaxation and cognitive therapy (Bogels, 2006). Similarly, in a separate pilot study, the combination of task concentration and mindfulness training resulted in significant pre- to post-treatment changes in negative beliefs on the BST-Q, which were maintained at follow-up (Bogels, Sijbers, & Voncken, 2006). However, there were no comparison

treatments or control groups in this study. Thus, further investigation is required to establish the effectiveness of task concentration training alone or in combination with other therapies.

Self-Statements

Production methods. Self-statements refer to thoughts that an individual is able to report about a particular experience or within a particular time frame, and are the primary material used in cognitive restructuring. Over thirty years ago, Cacioppo, Glass, and Merluzzi (1979) demonstrated that socially anxious and non-anxious individuals could list the thoughts they experienced in anticipation of a stressful social interaction or following a behavioral test. Using their procedure, the listed thoughts are then classified by research assistants as positive (facilitating functioning), negative (inhibiting functioning), or neutral.

This thought-listing procedure has frequently been used to assess self-statements in studies of CBGT. In Heimberg and colleagues' (1990) comparison of CBGT and ES group therapy, all participants demonstrated an increase in positive thoughts and a decrease in negative thoughts at post-treatment. However, at the six-month follow-up, decreases in negative thoughts remained significant only for participants who had received CBGT. Additionally, at the six-month follow-up, CBGT participants reported more positive and fewer negative thoughts than ES group participants. At the five-year follow-up, the two groups did not differ on positive or negative thoughts listed (Heimberg et al., 1993). In a comparison of CBGT to exposure alone and a wait-list control, Hope, Heimberg, and Bruch (1995) found a significant pre- to post-treatment decrease in negative thoughts for CBGT only. Finally, in a comparison of CBGT, abbreviated CBGT with computer-assisted homework, and a wait-list control, participants in both active treatments demonstrated equivalent reductions in negative thoughts at post-treatment (Gruber, Moran, Roth, & Taylor, 2001). Although participants in computer-assisted CBGT reported a greater increase in positive thoughts at post-treatment than either CBGT or wait-list participants, no differences between computer-assisted and standard CBGT remained at six-month follow-up.

In addition to examining the valence of thoughts, Hofmann, Moscovitch, Kim, and Taylor (2004) utilized this thought-listing procedure to examine the focus of thoughts (i.e., self-focused versus other-focused) recorded by participants in anticipation of three different social tasks. In their study, participants were randomly assigned to receive CBGT or exposure-only group therapy or to a waitlist control group. They found that both CBGT and exposure-only group therapy resulted in a significant reduction in negative self-focused thoughts, with no differences between the two groups at post-treatment.

Endorsement methods. Unfortunately, scoring the protocols from unstructured thought-listing exercises is quite time-consuming and requires training. Consequently, inventories of common positive and negative thoughts for a particular problem were developed and have been used more frequently than

thought-listing methods. The response format on these inventories requires the respondent to indicate the frequency with which they have experienced each thought and sometimes the strength of their belief in each thought.

The most commonly used self-statement inventory in research on SAD is the Social Interaction Self-Statement Test (SISST; Glass, Merluzzi, Biever & Larson, 1982). Only one treatment study has utilized the SISST without modification of items or instructions. Gelernter et al. (1991) had participants complete the SISST after an individualized behavioral test based on a primary feared situation. All treatment conditions—CBGT, alprazolam, phenelzine, and pill placebo—included homework exposure instructions. Individuals across conditions improved in the expected direction on the SISST from pre-treatment through post-treatment and two-month follow-up with no between-group differences. As will be shown later, when the SISST is used for situations other than heterosocial conversations, for which it was developed, researchers typically adjust the items to reflect the content of the behavioral challenge. That does not appear to have been done in this study, so it is unclear how applicable the SISST items were for participants whose individualized behavioral test involved a different type of interaction, such as a speech, or writing while being observed.

Five studies have adapted the SISST for use with a speech. Turner and colleagues (Turner, Beidel, Cooley et al., 1994; Turner, Beidel & Jacob, 1994) modified the SISST items to reflect thoughts during a speech as part of their standard behavioral test. In the first study, socially anxious participants treated with flooding reported fewer negative and more positive self-statements at post-treatment than those treated with atenolol or pill placebo. At six-month follow-up, individuals in the flooding condition reported more positive self-statements than individuals in the atenolol condition, with no between-group difference on negative self-statements. Both positive and negative self-statements improved from pre- to post-treatment in Turner and colleagues' SET (Turner, Beidel, Cooley et al., 1994); however the SISST was not included in their two-year follow-up (Turner, Beidel, & Cooley-Quille, 1995).

Using a similar modification of the SISST for a speech task, Taylor et al. (1997) compared positive and negative cognitions among GSAD participants who received cognitive therapy with participants who received an attentional-control treatment called associative therapy, which involved thinking about social anxiety but not attempting to modify cognitions. Both treatments were followed by exposure therapy, but systematic exposure was explicitly omitted during the first phase of treatment. At the end of the first phase, participants who had completed cognitive therapy reported fewer negative self-statements and more positive self-statements on the modified SISST than participants who had completed associative therapy. Despite the authors' hypothesis that cognitive therapy would facilitate exposure, there were no differences between the two treatment groups on the SISST after both had received exposure.

Hofmann and DiBartolo (2000) fully adapted the SISST for public speaking situations in developing the Self-Statements During Public Speaking Scale

(SSPS), which includes five negative and five positive cognitions. On an earlier version of the SSPS with 30 items, participants with primary public speaking fears demonstrated a significant reduction in negative cognitions during a behavioral speech task after they had completed a purely behavioral treatment (i.e., speaking skills training and exposure; Newman, Hofmann, Trabert, Roth & Taylor, 1994). Furthermore, another study showed that a subset of these participants reported fewer negative cognitions at the end of treatment, irrespective of whether they had comorbid avoidant personality disorder (Hofmann, Newman, Becker, Taylor, & Roth, 1995). However, wait-list controls showed no changes in cognitions at post-test (Newman et al., 1994).

Four studies have modified the instructions of the SISST and SSPS with instructions to capture thoughts about interactions and public speaking in general, rather than in reference to a specific behavioral challenge. In a comparison of CBGT and an educational-supportive group intervention, Heimberg et al. (1990) found positive self-statements increased from pre- to post-treatment with little change in the negative subscale of the SISST and no between-group differences. Also using the SISST in this way, Borgeat et al. (2009) found significant improvement over the course of both CBGT and exposure-only group therapy (which included video feedback). Furthermore, while negative thoughts improved more quickly over the course of exposure-only group therapy compared to CBGT, both groups continued to show improvement on the SISST-negative statements subscale over 12 months of follow-up (Borgeat et al., 2009). In another comparison of CBGT and exposure-only group therapy, Hofmann, Schulz, Meuret, Moscovitch, and Suvak (2006) found greater changes on the negative cognitions subscale of the SSPS following CBGT compared to exposure-only group therapy. However, there were no between-group differences for positive cognitions. With the negative subscale of the SSPS established as more sensitive to treatment changes than the positive subscale (Hofmann & DiBartolo, 2000), it may be expected that differential treatment changes would be more easily detected in negative thoughts. Nevertheless, Price and Anderson (2012) found improvement on both the negative and positive subscales of the SPSS following both exposure-only group therapy and individual virtual reality exposure therapy, with no between-group differences.

A variety of endorsement-style measures other than the SISST and SPSS have also been used in treatment outcome studies. Clark and Agras (1991) utilized the Self-Statement Questionnaire (Steptoe & Fidler, 1987) to compare various combinations of CBT, buspirone, and placebo. The results suggested that placebo with and without CBT resulted in fewer negative and more positive thoughts than buspirone alone at post-treatment. Six studies have utilized a Dutch self-statement questionnaire, the Social Anxiety Self-Statement Inventory (SASSI; Mersch et al., 1996). In Mersch's (1995) study, there was a reduction in negative self-statements for both *in vivo* exposure alone and *in vivo* exposure combined with rational emotive therapy and social skills training, but not for the wait-list group. There was no difference between *in vivo* exposure and the

combined treatment at post-test or 1.5-year follow-up, but gains were maintained. Scholing and Emmelkamp (1993a; 1993b; 1996a; 1996b) combined the negative subscale of the SASSI with the Social Cognition Inventory (SCI) as a composite measure of cognitive change. The SCI appears to be more of a belief measure than a self-statement measure, so these results do not strictly fall in the category of self-statements. In each of these studies, participants were treated with *in vivo* exposure alone or a combination of *in vivo* exposure and cognitive therapy that was presented either sequentially or in an integrated fashion as either group or individual treatment. Overall, participants in all treatment conditions demonstrated improvement in negative cognitions at post-treatment and three-month follow-up with little to no differences among the treatment conditions. Similarly, two studies utilized the Social Cognitions Questionnaire, which seems to be a combination of a self-statement measure and a beliefs measure in that it asks participants to rate the frequency and strength of the belief in social phobia-related negative thoughts they have experienced in that past week. Mortberg and colleagues (2007) found participants' frequency and belief ratings were lower at four-, eight-, and 12-month measurements compared to pre-treatment for all treatment conditions—intensive group cognitive therapy, individual cognitive therapy, and TAU (medication). However, participants in individual cognitive therapy reported more improvement than those in intensive group cognitive therapy or TAU (Mortberg et al., 2007). In addition, in a study of sudden gains in cognitive therapy and interpersonal therapy for SAD, participants who experienced a sudden gain during either treatment reported significant decreases in the frequency and strength of their negative thoughts following the gain (Bohn, Aderka, Schreiber, Stangier, & Hofmann, 2013).

Finally, both Jerremalm et al. (1986) and Mersch et al. (1989) used an apparently unvalidated self-statement measure created by Jerremalm et al. (1986) to examine cognitive outcomes of socially anxious participants classified as cognitive reactors, physiological reactors, or behavioral reactors. Jerremalm et al. (1986) found that cognitive reactors had improved on the self-statement measure at post-treatment whether they received applied relaxation or self-instructional training, but only those in the latter treatment differed from the wait-list control. However, only physiological reactors who received self-instructional training, but not applied relaxation, improved. In Mersch and colleagues' (1989) study, only three of the four treatment groups demonstrated significant pre- to post-treatment improvement in self-statements: cognitive reactors who received either social skills training or rational emotive therapy and behavioral reactors who received social skills training; behavioral reactors who received rational emotive therapy did not demonstrate improvement.

Conclusions about Beliefs and Self-Statements

In summary, this review demonstrates that negative cognitions from schemas and core beliefs to automatic thoughts and self-statements may change with treatment for SAD. The results for modification of irrational beliefs are mixed,

perhaps because many of the scales are broader measures of psychopathology and not all of these irrational beliefs would be addressed in treatments that focus on social anxiety. This may be why more recent studies of cognitive changes following SAD treatment have utilized alternative measures of beliefs. Overall, these studies have demonstrated that several treatments (i.e., cognitive therapy, CBT, interpersonal therapy, stress management) effectively reduce negative schemas and core beliefs in participants with little to no differences between treatments. In addition, there is some preliminary evidence that task concentration training, in combination with cognitive therapy or mindfulness training, may reduce automatic thoughts about showing physical symptoms among individuals with SAD.

With regard to measuring self-statements, it appears that thought-listing may be more sensitive to differences between active treatments than endorsement methods. In the Heimberg and Hope studies described above the interventions with a cognitive component showed more evidence of improvement in thoughts than strictly behavioral or educational interventions. However, the study by Hofmann et al. (2004) suggests that both cognitive-behavioral and exposure-based treatments resulted in significant reductions in negative self-focused thoughts.

While self-statement inventories may be less sensitive to differences in treatment effects, they are easier to utilize and show surprisingly consistent results despite their variety. Across active treatment modalities, reductions in negative self-statements and sometimes increases in positive self-statements are achieved by post-treatment with gains typically maintained at follow-up. Furthermore, active treatments consistently differ from attentional or wait-list control conditions; yet, differences between active treatments rarely emerge or are conflicting. Therefore, for researchers attempting a detailed comparison of different treatments, thought-listing may be worthwhile. Otherwise, self-statement inventories offer an efficient and reliable alternative.

Judgment and Interpretation Biases

Subjective Probabilities

Some researchers have hypothesized that normalization of biased subjective judgments about the probabilities and costs of various social outcomes is a key mechanism of change in successful treatment of SAD (e.g., Foa et al., 1996). "Probability bias" refers to overestimations of the likelihood of feared outcomes. "Cost bias" refers to elevated estimates about the cost if a mild negative outcome occurs. Ten studies have examined the effects of treatment on the subjective judgments of individuals with SAD for positive or negative social events.

Using the Subjective Probability Scale, Lucock and Salkovskis (1988) reported that subjective probability for negative social events decreased after social skills training in a small pilot study of eight participants with SAD. No changes in subjective probabilities occurred for positive social events or any

non-social events. In another study also using this scale (Taylor et al., 1997), the subjective probability for aversive, but not positive, events was lower for individuals who received cognitive restructuring versus associative therapy, the control condition. These two groups did not differ on subjective probabilities after both received group exposure; the within-group effect sizes indicated all participants had improved over the course of treatment and follow-up.

Foa and colleagues (1996) developed the Probability/Cost Questionnaire (PCQ), a 40-item self-report measure consisting of 20 negative nonsocial events and 20 negative social events, to investigate changes in probability and cost biases following treatment. The authors found that treatment (Heimberg's CBGT with an added social skills training component) reduced participants' judgments of the probability for negative social, but not nonsocial, events, but their ratings were still higher than those of non-anxious controls. Non-anxious controls did not change their ratings across assessment points. The personal cost of negative social and nonsocial events decreased with treatment, but participants still judged both to be more costly than the non-anxious controls, whose ratings did not change over time. In an attempt to understand how probability and cost judgments may mediate treatment outcome, Foa et al. (1996) conducted a series of hierarchical regression analyses, which revealed that change in the cost estimates for social events accounted for 58% of the variance in post-treatment SAD symptoms.

More recently, Hofmann (2004) investigated the impact of treatment on estimated social cost using the social events subscale of the PCQ (Foa et al., 1996), which consists of 10 performance situations and 10 nonperformance social situations of which respondents rate the perceived social cost. Participants were randomly assigned to receive either CBGT or exposure-only group therapy (which included video feedback) or to a wait-list control group. Hofmann found that both CBGT and exposure-only group therapy led to significant reductions in estimated social cost. In addition, pre- to post-treatment changes in estimated social cost were significantly correlated with pre-treatment to six-month follow-up changes for those who received CBGT, but not for those who received the exposure-only treatment.

McManus, Clark and Hackmann (2000) modified the PCQ (Foa et al., 1996) by removing non-social event items and adding items of "more strongly negative social events" (p. 204). This measure was administered before and after individual cognitive therapy, medication treatment (fluoxetine plus self-exposure instructions), or pill placebo. They found that participants in both treatment groups reported reduced probability and cost following treatment. Participants' post-treatment scores were also found to not significantly differ from a non-anxious control group. Additionally, they found that changes in both probability and cost predicted responder/non-responder status, as determined by mean change in social anxiety symptoms. Hierarchical regression analyses indicated that changes in probability played a more prominent role in social anxiety symptom change than changes in cost did, in contrast to the findings of Foa et al. (1996) which indicated changes in cost were more important.

Moscovitch and colleagues (2012) also used McManus et al.'s (2000) Social Probability and Cost Questionnaire in their examination of CBGT responders and non-responders. In this study, responders were defined by reliable change on the Social Phobia Inventory (Connor et al., 2000). Among responders, probability and cost estimates decreased from pre-treatment to post-treatment. However, no changes in subjective judgments were found for non-responders, potentially due to low initial probability and cost biases among non-responders. Mid-treatment changes in probability/cost estimates did not predict post-treatment change in social anxiety symptoms.

Rapee, Gaston, and Abbott (2009) also modified the PCQ (Foa et al., 1996) to create a 13-item measure of the probability and cost of hypothetical situations that could lead to negative evaluation (e.g., "you blush while being introduced to a new person"). Participants in this study were randomly assigned to standard CBGT (without cognitive work on schemas), "enhanced" CBGT (with evidence-gathering, elimination of safety behaviors, performance feedback, and attention training), or stress management (the control condition). Estimates of the probability and cost of negative evaluation improved from pre- to post-treatment for all treatments. Nevertheless, participants in "enhanced" CBT demonstrated a significantly greater decrease in cost estimates than those in stress management with a trend for greater change than standard CBGT.

The Probability and Cost Questionnaire (Taylor & Alden, 2008) was developed to distinguish between the probability and cost of negative outcomes related to the self (e.g., "you handle this situation poorly") and those related to others ("others respond negatively"). Thus, it yields four subscale scores: self-probability, self-cost, interpersonal probability, and interpersonal cost. Using the Probability and Cost Questionnaire, Taylor and Alden (2008) examined the effectiveness of interpersonal-CBT, a treatment integrating cognitive-behavioral and interpersonal models of social anxiety. At the end of treatment, interpersonal-CBT participants showed greater reductions in probability and cost estimates on all four subscales than the wait-list control group. Furthermore, the change in interpersonal judgment biases from pre- to mid-treatment, but not self-bias, was positively related to change in social anxiety symptoms over course of treatment.

Finally, two studies utilized the Appraisal of Social Concerns Scale (ASC; Telch et al., 2004), which asks participants to rate the probability and cost of various outcomes during exposures to public speaking and social situations (e.g., trembling, appearing stupid, people laughing at you, blushing, losing control). Smits, Rosenfield, McDonald, and Telch (2006) examined the effects of exposure-based treatment (aggregated across groups with or without various types of videotape feedback) focused on public speaking. Smits et al. found that exposure treatment led to significant reductions in both probability and cost biases. Furthermore, reductions in probability bias predicted fear reduction, which predicted additional reduction in probability bias; reductions in cost bias did not predict but were predicted by fear reduction (Smits et al., 2006).

Similarly, Robillard, Bouchard, Dumoulin, Guitard, and Klinger (2010) found that CBT with *in vivo* exposures and CBT with *in virtuo* exposures both resulted in greater reductions in probability and cost biases than a wait-list condition.

Interpretation Bias

With the ambiguity inherent in most social interactions, many alternative explanations are available for common verbal and nonverbal ambiguous social stimuli. According to cognitive theories, individuals with SAD are likely to generate threatening explanations for these events and subsequently engage in avoidance behavior, which prevents testing of these interpretations (Franklin, Huppert, Langner, Leiberg, & Foa, 2005) and maintains the disorder (Foa, Franklin, & Kozak, 2001). Consistent with this model, Franklin et al. (2005) found that individuals with GSAD demonstrated more negative interpretations of ambiguous social situations than non-anxious controls.

In one of the first treatment studies to examine interpretation bias, Franklin and colleagues (2005) compared responses of treated and untreated GSAD participants on the Interpretation Questionnaire (Butler & Mathews, 1983), which assesses explanations for ambiguous social and nonsocial situations. In a between-subjects design, untreated participants completed the Interpretation Questionnaire before participating in CBT plus social skills training, while treated participants completed it afterward. Treated participants showed less interpretation bias than untreated participants in their rankings of neutral and ambiguous interpretations of social and nonsocial situations as well as their free interpretations of nonsocial, but not social, situations. Furthermore, there were no differences between the interpretations of treated participants and non-anxious controls (Franklin et al., 2005).

In another study examining the effects of CBT on interpretation bias, Wilson and Rapee (2005a) used their own measure, the Consequences of Negative Social Events Questionnaire (CONSE-Q; Wilson & Rapee, 2005b). The CONSE-Q assesses the degree to which individuals believe three possible interpretations reflecting negative evaluations by others, negative traits in oneself, and negative long-term consequences. Participants were randomly assigned to CBGT with attention training or abbreviated CBT with bibliotherapy. However, cognitive changes did not differ across treatments, so these groups were combined for analyses of interpretation bias. Belief ratings were reduced for all three interpretations at post-treatment. Furthermore, reductions in self-reported social anxiety symptoms were related to reductions in interpretation biases; reductions in interpretations of events as indicative of possessing negative characteristics in particular predicted long-term improvement in SAD as seen at three-month follow-up (Wilson & Rapee, 2005a).

More recently, researchers have started to investigate methods of directly changing information processing biases through interpretation training. Amir and Taylor (2012) assessed initial interpretation bias using a word-sentence association paradigm (WSAP; Beard & Amir, 2009), which is presented on

a computer. First, a fixation cross is replaced by a word suggesting either a threatening interpretation (e.g., embarrassing) or a benign interpretation (e.g., funny). Then, an ambiguous sentence appears (e.g., "people laugh at something you said") and participants must indicate whether or not the word and sentence are related by pressing one of two keys. Interpretation training follows the same procedure as the WSAP, except that participants receive positive or negative feedback about the accuracy of their answers. In this study participants were randomly assigned to complete eight to 12 sessions of an interpretation modification program (IMP, where 100% of the trails in which they endorsed benign interpretations or rejected threatening interpretations led to positive feedback) or an interpretation control condition (ICC, where 50% of the trials in which they endorsed benign interpretation or rejected threatening interpretation led to positive feedback and 50% led to negative feedback). From pre- to post-treatment, the IMP and ICC groups both showed a significant decrease in endorsement of threatening interpretations, but only the IMP group showed a significant increase in endorsement of benign interpretations. In addition, the IMP group made significantly fewer threatening and more benign interpretations than the ICC group at post-treatment (Amir & Taylor, 2012).

Finally, one small pilot study investigated the effects of a cognitive therapy designed specifically to challenge both judgment and interpretation biases in social anxiety (Voncken & Bogels, 2006). Although the study was uncontrolled, it appears that an idiosyncratic measure and a standard questionnaire showed large treatment effects for interpretation and judgment biases suggesting specific targeting of this mechanism may be helpful.

Conclusions about Judgment and Interpretation Biases

In summary, there is substantial evidence to suggest that change in judgment biases (overestimates of probability and cost) may be an important mediator of clinical improvement in SAD for cognitive and/or behavioral treatments (Hofmann, 2004; Foa et al., 1996; McManus et al., 2000; Smits et al., 2006; Taylor & Alden, 2008). There is also some preliminary evidence indicating changes in interpretation bias may be an important predictor of long-term improvement following CBT (Wilson & Rapee, 2005a). As a result, some researchers have designed treatments intended to specifically address judgment and interpretation biases found in SAD (Amir & Taylor, 2012; Voncken & Bogels, 2006). Although these specialized treatments appear to result in significant improvements, this review suggests that most cognitive and/or behavioral treatments for SAD result in significant improvements in judgment and interpretation biases, including CBGT, social skills training, exposure therapy, cognitive therapy, interpersonal-CBT, and CBT with virtual reality exposures. Nevertheless, results are mixed as to whether or not participants treated for SAD achieve judgment and interpretation skills within the normal range (Foa et al., 1996; Franklin et al., 2005; McManus et al., 2000).

Attentional Processes

Examining attentional processes as a treatment outcome tests both specific hypotheses from cognitive models of SAD and the purported mechanism within the new attention-training programs. The more recent studies have usually measured threat-based attentional biases in SAD using visual probe tasks similar to those used as part of the attention training. However, earlier studies tended to measure attentional bias using the emotional Stroop task, since it has been shown that individuals with SAD demonstrate a bias towards social threat stimuli compared to neutral words, which is not found in non-anxious controls.

Mattia, Heimberg, and Hope (1993) reported that interference for social threat cues on the emotional Stroop task was reduced after successful, but not unsuccessful, treatment, for SAD. The study did not distinguish color-naming performance among the possible treatments—CBGT, phenelzine, or pill placebo. Conversely, Lundh and Ost (2001) found reduced Stroop interference for color words and physical threat words following CBT for SAD, but not for social threat words. However, when treatment responders and non-responders were analyzed separately, results were similar to those of Mattia et al. (1993). Interference for social threat words was significantly reduced at post-treatment among responders, but not non-responders. Nevertheless, non-responders showed little interference even at pre-treatment (Lundh & Ost, 2001). It should be noted that this study did not distinguish between treatments (individual CBT, CBGT, or self-treatment manual) either. More recently, Nortje and Posthumus (2012) used the emotional Stroop task to compare the attentional effects of exposure alone, CBGT, CBGT plus hypnosis, and wait-list control. A combined group of all treated participants demonstrated a greater reduction in Stroop interference for social threat words from pre-treatment to post-treatment than wait-list controls. This effect was not significant when wait-list control was compared with the three active treatments separately.

Several more recent studies have focused on treating SAD by directly altering attention mechanisms with a computer-delivered attention modification protocol (AMP) developed by Amir and colleagues (2009). In AMP attention is trained away from a face showing disgust using a modified dot-probe paradigm (MacLeod et al., 1986). The attention control condition (ACC) trains attention equally towards neutral and disgust faces. Treatment outcome assessment of attentional bias has then generally relied on a modified Posner paradigm (Posner, 1980) where social threat or neutral cue words are presented on opposite sides of a computer screen. A probe then appears in the location of one of the two words and participants are instructed to identify the location of the probe as quickly and rapidly as possible. Longer response latencies when the probe is located opposite the social threat word suggests that the participant had difficulty shifting attention away from threat.

In the initial study, Amir et al. (2009) found that participants in the AMP group displayed significantly reduced response latencies following treatment,

whereas response latency did not significantly decrease among participants in the ACC group from pre- to post-treatment. Heeren and colleagues (2012) used a similar attention-training protocol to Amir and colleagues (2009) with four minor differences: (1) happy faces were used in place of neutral faces, (2) threatening faces showed expressions of anger rather than disgust, (3) participants completed four sessions rather than eight, and (4) a third condition was added where the probe appeared with 80% frequency in the location of the angry threatening face (AT). In this study, AMP participants demonstrated a significant decrease in attentional bias to threat from baseline to post-treatment, whereas no changes in attentional bias occurred for AT or ACC participants. Thus, preliminary evidence suggested that computerized attention training could result in reduced attentional bias for threat cues. However, three studies investigating an Internet-based version of the same attention-training protocol as Amir et al. (2009) found no differences in the effects of AMP and ACC on attentional bias (Boettcher, Berger, & Renneberg, 2012; Carlbring et al., 2012; Neubauer et al., 2013). Furthermore, Rapee and colleagues (2013) found that incorporation of daily attention-training homework into an "enhanced" CBT treatment package for SAD (CBT, feedback, elimination of safety behavior, and effortful focusing of attention toward the social task) resulted in no additional benefits. Although these researchers utilized a dot-probe paradigm with threatening and neutral words instead of images, their attention-training protocol was otherwise very similar.

Conclusions about Attentional Processes

In summary, evidence from studies employing the emotional Stroop task has consistently supported the effectiveness of treatment in reducing attentional bias to threat among individuals with SAD over and above any changes seen in wait-list controls. However, the lack of effect on the emotional Stroop in non-responders cannot necessarily be attributed to treatment outcome, as non-responders may not exhibit bias towards social threat on the emotional Stroop at baseline. Whether a lack of attentional bias could be a predictor of non-responder status has not been explored. In addition, these studies have not distinguished between various psychosocial and pharmacological treatments, so it remains unknown whether a particular treatment holds any advantages for clients with strong pre-treatment attentional biases. Finally, some evidence also exists for the efficacy of attention-training programs in modifying attentional bias to threat (e.g., Amir et al., 2009). However, these effects have failed to replicate in several other studies (e.g., Carlbring et al., 2012), so additional research is needed.

Conclusions about Cognitive Change

Overall, this review reveals that the cognitions of individuals with SAD with a variety of clinical presentations (e.g., generalized, public speaking, showing physical symptoms) are responsive to interventions. It appears that core beliefs

and self-statements specific to social anxiety may be easier to change than broader dysfunctional beliefs. Surprisingly, both cognitive and non-cognitive interventions appear equally effective in changing cognition. Some hints in Scholing and Emmelkamp's studies (1993b, 1996b) with GSAD showed that it may be more helpful for participants in group therapy to do cognitive interventions followed by exposure, rather than fully integrating the two components. In contrast, Taylor and colleagues (1997) did not find that early cognitive therapy followed by exposure facilitated self-statement change. However, the designs of the two studies are not strictly comparable. Also, change in self-statements among socially anxious individuals who are characterized by strong physiological reactions to feared situations may be facilitated with a cognitive intervention, compared with applied relaxation alone. Additionally, several recent studies provide evidence that changes in judgment and interpretation biases may be important mediators of clinical improvement. Finally, some preliminary evidence suggests that directly altering attention patterns through attention training can result in reduced social anxiety symptoms. However, this evidence should be interpreted with caution, pending more consistent replication across studies of attention training. There is some evidence for changes in attentional bias following more established treatments for SAD, especially among treatment responders.

Fear of Negative Evaluation

The core feature of SAD is concern with being negatively evaluated by other people (DSM-5, 2013; Rapee, 1995). Butler (1989) argued that fear of negative evaluation is essentially a cognitive construct and thus may be particularly amenable to cognitive interventions. As will be discussed later, this has not proven to be true. However, Mattick and colleagues (Mattick et al., 1988; Mattick et al., 1989) found that change in fear of negative evaluation predicted long-term success in treatment. A review of treatment-outcome studies that included a wait-list control condition revealed that fear of negative evaluation generally does not improve spontaneously over a few weeks or months (e.g., Mattick et al., 1989; Newman et al., 1994). Any spontaneous changes that have appeared in the literature are very small and of little clinical significance (e.g., Hope, Heimberg, & Bruch, 1995).

Typically, the fear of negative evaluation has been assessed with the Watson and Friend (1969) self-report questionnaire, entitled the Fear of Negative Evaluation Scale (FNE), or the brief version of the scale, the Brief Fear of Negative Evaluation Scale (BFNE) (Leary, 1983). Only occasionally are other measures, such as fear of negative evaluation ratings for the situations on an individualized Fear and Avoidance Hierarchy (Hope, Heimberg, & Bruch, 1995) or a subscale of the Fear Survey Schedule (Wolpe & Lang, 1964), used to assess social-evaluative concerns.

Cognitive interventions target dysfunctional assumptions about other people's negative evaluations of the individual with SAD. Thus, one would expect

that cognitive interventions on their own would lead to reductions in fear of negative evaluation. Mattick et al. (1989) found that individuals diagnosed with SAD who received cognitive restructuring without exposure for severe fears of scrutiny by others improved on the FNE at post-treatment. Taylor and colleagues (1997) compared cognitive restructuring to a control intervention-associative therapy. Individuals receiving cognitive therapy made more improvement on the BFNE than individuals receiving associative therapy.

Clark's cognitive therapy (CT; Clark, 1997) emphasizes the Clark and Wells (1995) model of maintenance of SAD and focuses on a number of components: (1) developing a personal model of SAD for each client, (2) safety behaviors and self-focused attention experiments, (3) shifting of attention focus, (4) video feedback, (5) behavioral experiments, (6) changing problematic anticipatory and post-event processing, and (7) challenging dysfunctional assumptions. In the first study evaluating this treatment, Clark et al. (2003) compared CT to fluoxetine plus self-exposure and placebo plus self-exposure. They found that CT led to a greater reduction in fear of negative evaluation compared to the other treatments, which did not differ from each other, at post-treatment and 12-month follow-up. Clark and colleagues (2006) compared CT to exposure plus applied relaxation (Butler, 1985; Ost, 1987) and a waitlist control group. Participants in both the CT and exposure plus applied relaxation groups reported significant reductions in FNE scores at post-treatment and compared to the waitlist control group. This reduction was significantly greater for participants who received CT compared to exposure plus applied relaxation at post-treatment and three-month follow-up; however, there was no significant difference in FNE scores at one-year follow-up. When Mortberg and colleagues (2007) compared CT and an intensive group CT incorporating applied relaxation with pharmacological TAU, similar results emerged. Participants in CT showed greater reductions in fear of negative evaluation than either intensive group CT or TAU when assessed with the FNE at four, eight, and 12 months after starting treatment. Furthermore, participants in both CT and intensive group CT showed continued improvement at five-year follow-up such that there were no longer between-group differences (Mortberg, Clark, & Bejerot, 2011). Borge and colleagues (2008) modified Clark's (1997) CT for use with individuals in a residential treatment center in Norway. They found that FNE scores significantly decreased from pre-treatment to post-treatment and continued to improve from post-treatment to one-year follow-up (Borge et al., 2008). Finally, de Oliveira and colleagues (2012) compared conventional CT to trial-based CT, an intervention focused on challenging core beliefs with cognitive therapy techniques modified to reflect courtroom procedures (e.g., examining evidence for and against as prosecutor and defense attorney). They found significant reductions in FNE scores from pre-treatment to post-treatment for both treatments, but post-treatment scores were lower among participants in trial-based CT than those in conventional CT (de Oliveira et al., 2012). Gains were maintained at 12-month follow-up for both treatment groups.

Despite its utility, a cognitive intervention may not be essential to reduce fear of negative evaluation. A number of studies employed exposure-alone conditions that were carefully constructed to avoid the inclusion of cognitive interventions. Taylor et al. (1997) followed cognitive restructuring or associative therapy with an exposure-alone group treatment. Two studies by Mattick and colleagues (Mattick & Peters, 1988; Mattick et al., 1989) included an exposure-alone treatment condition for socially anxious participants who had severe fears of scrutiny. Hope, Heimberg and Bruch, (1995) used exposure-alone with a heterogeneous group of socially phobic participants on two measures of fear of negative evaluation—the FNE and fear of negative evaluation ratings for situations on an individualized Fear and Avoidance Hierarchy. Mersch used the BFNE and exposure with a heterogeneous group of individuals with SAD (Mersch, 1995) or who had comorbid personality disorders (Mersch et al., 1995). Salaberria and Echeburua (1988) used a translation of the FNE with SAD participants in the Basque region of Spain who received exposure with or without a self-help manual (which had no effect). Butler, Cullington, Munby, Amies, and Gelder (1984) utilized an exposure-alone treatment condition that included some filler material to equalize time spent in a combined exposure-plus-anxiety-management treatment condition also included in the study. Haug and colleagues (2003) used the FNE to compare sertraline, sertraline plus exposure, exposure therapy plus placebo, and a pill placebo. Finally, Nortje, Posthumus, and Moller (2008) used the FNE with social phobic participants (generalized type) following an exposure-alone treatment and at three months post-treatment. The results of these studies are mixed. Participants in both Mattick studies, in Hope, Heimberg, et al., in Mersch, and in Mersch et al. demonstrated improvement in fear of negative evaluation from pre- to post-treatment. Mersch and Salaberria and Echeburua also reported additional improvement over the extended follow-up period (1–1.5 years). Haug et al. reported significant reductions in FNE scores up to one year following exposure treatment, with participants in the exposure therapy plus placebo showing the greatest long-term reduction. In Taylor et al., exposure resulted in substantial additional improvement in fear of negative evaluation, regardless of whether participants had originally received cognitive therapy or the associative therapy. However, Butler and colleagues reported little change on the FNE for the exposure-plus-filler-material treatment. Also, Nortje and colleagues (2008) found no significant reductions in FNE scores at post-treatment or follow-up.

Other non-cognitive treatments may also result in improvements in fear of negative evaluation. In Turner, Beidel, and Jacob (1994), flooding produced modest change on the FNE at post-treatment, and additional change was evident at six-month follow-up. Social skills training for SAD also led to changes in fear of negative evaluation in Stravynski et al. (1982). Additionally, BFNE scores significantly decreased during interpersonal therapy for SAD in Borge et al. (2008) and Lipsitz et al. (2008); however, there were no differences from CT and psychodynamic supportive therapy, respectively. Heeren and colleagues

(2012) found that pure attention training toward positive faces (which did not address negative cognitions) resulted in lower FNE scores at post-test and two-week follow-up than attention training toward threat or attention control training. Finally, online treatment with an acceptance-based behavior therapy for SAD (Dalrymple & Herbert, 2007) that incorporated exposure, social skills training, and refocusing attention presented through Second Life led to significant reductions in BFNE scores at post-treatment and three-month follow-up (Yuen et al., 2013).

As has been noted elsewhere, many of the treatment outcome studies for SAD included a combination treatment condition. Overall, the various combinations of treatment appear to be effective in reducing fear of negative evaluation. Heimberg's CBGT, which combines cognitive restructuring and exposure, led to significant improvement in fear of negative evaluation across several studies (Bjornsson et al., 2011; Cox, Ross, Swinson, & Direnfeld, 1998; Gelernter et al., 1991; Gruber et al., 2001; Heimberg et al., 1985; Heimberg et al., 1990; Heimberg et al., 1998; Hope, Heimberg, & Bruch, 1995; Hope, Herbert, & White, 1995). These changes were maintained at follow-up with the exception of the five-year follow-up, in which improvement in fear of negative evaluation had diminished somewhat (Heimberg et al., 1993). Participant characteristics such as subtype of SAD or comorbid avoidant personality disorder do not appear to affect the outcome of CBGT on fear of negative evaluation (Brown, Heimberg, & Juster, 1995; Hope, Herbert, et al., 1995). Similarly, Ledley et al. (2009) found that an individualized version of CBGT (Hope, Heimberg, Juster, & Turk, 2000; Hope, Heimberg, & Turk, 2006) was effective in significantly reducing fear of negative evaluation at post-treatment and three-month follow-up. Furthermore, Robillard and colleagues (2010) showed individual CBT to be effective at reducing fear of negative evaluation whether exposures were conducted *in vivo* or *in virtuo*.

Other treatment packages that combined exposure and a cognitive intervention yielded similar changes in fear of negative evaluation (Mattick & Peters, 1988; Mattick et al., 1989; Mersch, 1995). Basque participants with SAD who received a combined exposure and cognitive-restructuring intervention improved on the FNE at post-test and continued to improve through the one-year follow-up (Salaberria & Echeburua, 1998). Gaston, Abbott, Rapee, and Neary (2006) found that CBGT (consisting of a combination of cognitive restructuring, exposure, attention training, assertiveness training, and performance training with feedback; Rapee & Sanderson, 1998) resulted in significant decreases in BFNE scores at post-treatment and three-month follow-up regardless of whether it was implemented in a research clinic or private practice.

In contrast to these positive findings, in a multiple baseline study of a combined exposure and cognitive restructuring treatment for scriptophobia, change on FNE was only noted in one of three participants at nine-month follow-up (Biran, Agusto, & Wilson, 1981). Also, Mortberg, Karlsson, Fyring, and Sundin (2006) found no significant changes in FNE scores at post-treatment, three-,

six-, and 12-month follow-ups following intensive (three weeks) CBGT that included cognitive restructuring, applied relaxation, and public speaking exposures. Additionally, Nortje and colleagues (2008) found no improvement in fear of negative evaluation following a combined cognitive restructuring and exposure treatment at post-treatment or three-month follow-up.

Combinations of exposure or cognitive interventions and alternative treatment techniques have also been explored in several studies. Butler et al.'s (1984) combination of exposure and anxiety management (relaxation, rational self-talk, and distraction) yielded larger reductions in fear of negative evaluation than the wait-list control. Combining rational restructuring with social skills training (Stravynski et al., 1982) was also effective in reducing fear of negative evaluation. Similarly, Newman et al. (1994) reported that a combination of exposure and skills training for individuals with public speaking fears produced reductions on the FNE. No follow-up data were reported. Socially phobic participants who received Turner and colleagues' SET (Turner, Beidel, Cooley et al., 1994), which combines exposure, social skills training, education, and programmed practice, reported significant reductions in fear of negative evaluation at post-treatment. The FNE was not included in the two-year follow-up, so durability of this result is not known (Turner et al., 1995). Finally, Herbert, Rheingold, Guadiano, and Myers (2004) found that a combination of individual CBT and social skills training resulted in significantly lower BFNE scores at post-treatment and three-month follow-up. Herbert and colleagues (2005) also found that a combination of CBGT and social skills training was superior to CBGT without social skills training in reduction of BFNE scores at post-treatment and three-month follow-up.

However, it is rare to find that two active treatments differed in their impact on fear of negative evaluation. When present, such differences tend to be small and fail to maintain at later assessment points. Although changes in fear of negative evaluation for CBGT were sometimes not as strong as exposure-alone (Hope, Heimberg & Bruch, 1995) or phenelzine (Heimberg et al., 1998) at post-test, these differences dissipated during the follow-up periods (Liebowitz et al., 1998). Furthermore, CBGT and a non-specific group therapy treatment did not differ in reduction of BFNE scores at post-treatment in college students with SAD (Bjornsson et al., 2011). However, the ES treatment used as an attentional control in Heimberg's work resulted in similar or smaller changes in fear of negative evaluation compared with CBGT. Also, in Butler et al. (1984), the combined exposure-plus-anxiety-management treatment, but not exposure-alone, differed from the wait-list control.

To conclude, it appears that nearly all of the treatments employed across studies yielded some change in fear of negative evaluation. If social-evaluative concern is the core feature of SAD, then it appears that there may be several paths to modify that concern. Any of these treatments are likely to yield positive results on the standard measures of fear of negative evaluation, although the data are weakest for social skills training alone. To date, there is no evidence

that individuals with certain characteristics would benefit from one treatment or another in changing fear of negative evaluation. However, little research addressing this question has been conducted.

TREATMENT IMPACT ON OVERT BEHAVIORAL PERFORMANCE

Individuals presenting with SAD often report longstanding patterns of avoidance or escape from feared situations. When they do enter feared situations, socially anxious individuals often report that they lack social skills and perform poorly (e.g., Hope, Burns, Hayes, Herbert, & Warner, 2010; Norton & Hope, 2001b; Stopa & Clark, 1993). However, there is some evidence that they may underestimate the quality of their performance (Hope, Heimberg & Bruch, 1995). Over the years, a number of treatment studies have tested whether treatment impacts overt behavior, including avoidance/escape and performance quality or social skills. This review will address only those studies that included a behavioral challenge of some type, including *in vivo* or role-played social interactions or speeches and behavioral-approach tests. Additional studies included self-report measures of behavior, but these will not be included here in order to emphasize objective ratings uninfluenced by self-report biases.

Escape and Avoidance

Two primary paradigms have been used to assess escape and avoidance in SAD. Beidel and Turner developed a standardized public speaking task, during which they allow escape after the first three minutes. The primary behavioral index is the time before escape, and this appears to be a valid measure of behavioral performance, even for socially anxious individuals for whom public speaking is not the primary complaint (Beidel, Turner, Jacob, & Cooley, 1989). The second approach to assessing avoidance in SAD is the behavioral avoidance test, or BAT (e.g., Mattick & Peters, 1988). Following the construction of a hierarchy of feared situations, the individual indicates the highest ranked situation that could be completed without excessive anxiety. That situation is then enacted, usually *in vivo*. Working on the assumption that lower situations could also be completed, the primary measure is the percentage of hierarchy items that can be completed.

Cognitive restructuring alone does not appear to lead to strong changes on the BAT. In their study of scriptophobia, Biran and colleagues (1981) found little improvement on the BAT for the cognitive-restructuring portion of the treatment. Mattick et al. (1989) reported that cognitive restructuring alone was better than the wait-list on the BAT, but change was slower and never equaled improvement with the combined cognitive and exposure intervention at follow-up.

Pure exposure treatments, either graduated or flooding, yield positive changes in escape/avoidance behavior. Exposure-alone was better than the wait-list on the BAT; however, it was less effective than combined exposure and cognitive

restructuring at three-month follow-up (Mattick & Peters, 1988; Mattick et al., 1989). Biran et al. (1981) found exposure-alone resulted in less avoidance on the BAT than cognitive restructuring for scriptophobia, but Mattick and colleagues (1989) found the two treatments equally effective on the BAT. Flooding resulted in more improvement (greater delay to escape) when compared with atenolol and placebo at post-test (Turner, Beidel, & Jacob, 1994). Follow-up data were not reported.

Several studies have examined the impact of combination treatments on avoidance and escape. As noted previously, Mattick and colleagues (Mattick & Peters, 1988; Mattick et al., 1989) twice found that the combination of exposure and cognitive restructuring yielded the best results on the BAT, compared with exposure or cognitive restructuring alone, especially at six-month follow-up. Turner and colleagues' SET yielded a substantial increase in speaking time (delayed escape) in a single subject study (Fink et al., 1996), but there was no change in speaking time in a larger study of SET (Turner, Beidel, Cooley et al., 1994). Speaking time did not improve pre- to post-treatment or differ from wait-list control with a combined treatment of exposure and speaking skills training (Newman et al., 1994). This null result was unaffected by comorbid avoidant personality disorder (Hofmann et al., 1995). Similarly, number of words spoken during a speech task did not significantly change after treatment with CBGT or citalopram and did not differ from wait-list control (Furmark et al., 2002). Hofmann (2004) found that escape during a speech task was significantly reduced following either CBGT or exposure-alone group therapy compared with a waitlist control group. Slightly more participants in the exposure-alone group escaped the speech task compared to the CBGT group, though the difference between the two groups was not significant. A similar pattern of results was found for speech duration (Hofmann et al., 2004). Finally, Price and Anderson (2011) also found that SAD participants with primary public speaking fears delayed escaping a speech task significantly longer following either exposure group therapy (Hofmann, 2004) or virtual reality exposure therapy (Anderson, Zimand, Hodges, & Rothbaum, 2005), which both incorporated cognitive techniques to change self-perceptions and self-focused attention. No between-group differences were found.

Conclusions About Escape/Avoidance

Relatively few studies have included a behavioral measure of escape or avoidance of feared situations. Cognitive restructuring alone does not appear to be the treatment of choice to reduce avoidance behavior on a BAT. Combined cognitive and exposure treatments have shown the most positive results for reducing avoidance. Exposure alone may be as effective, but there is no evidence it is more effective than combination treatments. There is less research available on improvements in time to escape from a public speaking task following treatment for SAD. Nevertheless, some evidence exists that both exposure-only and cognitive-behavioral treatments lead to delayed escape from post-treatment

speeches. In addition, one single case study demonstrated longer speaking time following SET, though this result was not replicated in a larger SET study.

Behavioral Ratings of Performance Quality

Ratings of the quality of performance in social interactions have typically been the sum of micro ratings of social behaviors (e.g., voice loudness, eye contact) or macro ratings of overall skill or quality. In the literature on social skills assessment, there has been a surprising lack of concordance between micro and macro ratings, suggesting that the overall ratings are more than the sum of the individual components (see Meier & Hope, 1998; Norton & Hope, 2001a). Furthermore, measures of apparently similar constructs appear by different names in the literature on treatment of social anxiety disorder, including "social skill" and "performance quality." Because social skill infers that deficits are attributable to a lack of skill, as opposed to an anxiety-based performance decrement, the more general term "performance quality" will be used here, unless the study itself used a different term. Given the inherent biases in self ratings, only ratings by independent observers will be included.

Social skills training is designed specifically to address observable social behavior, so it is not surprising that studies of social skills treatments have tended to include behavioral ratings of performance quality. Mersch et al. (1989) found improvements in social skills[1] in videotaped reactions to brief social scenarios for both behavioral and cognitive reactors who received social skills training. Individuals who received rational-emotive therapy, regardless of classification as behavioral or cognitive reactors, did not improve in social skill. Despite the within-group change for social skills training, there were no significant differences among the treatment groups at post-test. Follow-up data are not reported on this measure.

More frequently, studies have examined multicomponent treatments for SAD that include social skills training along with other interventions. Overall effectiveness of social skill was rated by independent raters for two social interactions in Turner, Beidel, Cooley, et al.'s (1994) evaluation of SET. Participants demonstrated significant improvement in social skills at mid-treatment, following the social skills intervention. Gains were maintained, but not increased at post-test after the exposure portion of the intervention. Follow-up data were not reported. Similar improvement in social skill was seen in the single-subject study using this intervention (Fink et al., 1996). Herbert and colleagues (2005) found that CBGT plus social skills training resulted in significantly greater improvement in a composite of independently rated verbal, nonverbal, paralinguistic, and overall social performance than CBGT without social skills training

[1]These ratings were made by confederates, not independent observers, due to equipment malfunction. However, the authors demonstrated that confederate and independent ratings were highly correlated, so the study is included.

during a role-played interaction with a confederate, while there was a trend toward a significant difference for a role-played interaction with two confederates and an impromptu speech task.

Heimberg's CBGT has been examined in four studies that included a performance quality measure. Although a performance quality rating was not included in the original study comparing CBGT and the attention-control intervention consisting of education and support (Heimberg et al., 1990), at five-year follow-up (Heimberg et al., 1993), individuals who had received CBGT received higher consensus ratings of performance quality than individuals who had received the control treatment. CBGT also yielded improvement on an overall social skills rating using trained observers of videotaped interactions (Hope, Herbert et al., 1995). No differential improvement was seen based on SAD subtype or the presence of avoidant personality disorder. No follow-up data were reported for this measure. Furthermore, Hope, Heimberg, et al. (1995) reported significantly greater improvement in consensus ratings of performance quality based on videotapes of individualized behavioral tests following CBGT, compared with wait-list control. However, CBGT did not differ from exposure-alone at post-test. Similarly, Gruber and colleagues (2001) found greater improvement in uninformed confederates' ratings of overall performance quality during an interaction BAT after either CBGT or computer-assisted CBGT than after wait-list control. These gains in overall performance were maintained at six-month follow-up with no differences between CBGT and computer-assisted CBGT. However, micro ratings of gaze and length of utterances did not change from pre-test to post-test for either treatment (Gruber et al., 2001).

Two additional studies have examined other combinations of cognitive and behavioral interventions. When CBGT was expanded to include diaphragmatic breathing and attentional instruction, pre- to post-treatment change was observed on a composite variable of independent ratings of skill and anxiety for three behavioral tests (Woody, Chambless, & Glass, 1997). In addition, Clark and Agras (1991) reported that cognitive therapy combined with exposure was more effective in improving the performance of anxious musicians than buspirone or placebo.

Only three studies have examined performance quality following either cognitive therapy alone or exposure-alone as the primary treatment. As noted previously, Mersch et al. (1989) found no improvement in social skills for cognitive or behavioral reactors who received rational-emotive therapy. Also mentioned previously, individuals who received exposure without a cognitive intervention demonstrated pre- to post-treatment improvement on a consensus rating of performance quality (Hope, Heimberg et al., 1995). Exposure-alone and combined cognitive and exposure treatment did not differ, but both active treatments showed more improvement on performance quality than the wait-list control. In the Newman et al. (1994) study, socially anxious individuals receiving treatment for public speaking anxiety with an intervention consisting of exposure and some speech skills training improved on overall speaking skills as

rated by briefly trained audience members. However, these participants did not differ from the wait-list control group, who also improved somewhat. A subset of these participants assessed for avoidant personality disorder did not differ on improvement in speaking skills depending on presence or absence of APD (Hofmann et al., 1995).

Finally, three studies have measured performance quality after attention training, alone or in combination with interpretation training. Heeren and colleagues (2012) assessed speech performance after attention training toward positive faces (AP), attention training toward threatening faces (AT), or control attention training (AC). Two uninformed judges rated AP participants' performances as showing significantly less anxiety than those of AT and AC participants at post-training. Furthermore, AP participants' performance significantly improved from baseline to post-test, while AT participants' performance significantly declined and AC participants' performance did not change (Heeren et al., 2012). Neubauer and colleagues (2013) also found some improvements in observer performance ratings for an interaction BAT following internet-delivered attention training. However, post-test performance ratings were only marginally better for attention modification than for attention control. In addition, no significant changes were found in performance quality ratings for a speech BAT (Neubauer et al., 2013). Finally, Beard, Weisberg, and Amir (2011) investigated an intervention for SAD that combined the previously described attention modification program (dot-probe task in Amir et al., 2009) and interpretation modification program (word-sentence association task in Beard & Amir, 2009). Participants were randomly assigned to attention and interpretation modification for SAD (AIM) or a placebo control that utilized a dot-probe task with no training toward or away from threat and a word-sentence association task that was unrelated to social interpretations. At post-test, research assistants rated performance quality during a speech task as significantly better for the AIM group than the control group (Beard et al., 2011).

Conclusion about Performance Quality

Despite the obvious conceptual link between social skills interventions and clinical changes on the quality of observable performance in social interactions, the evidence supporting social skills training alone is not strong. Perhaps the best support for social skills training is as part of SET, given that Turner and colleagues found improved performance following the initial treatment phase. There is also little support for cognitive interventions alone in improving overt performance. Exposure-alone may be more effective than cognitive therapy alone, but the most consistent results are for combined interventions. CBGT, in particular, has consistently led to more improvement in performance quality than wait-list or attention controls, regardless of diagnostic subtype or the presence of comorbid avoidant personality disorder. Finally, attention training and interpretation training also show promise for improving performance quality. However, attention training may be less effective when delivered over the

Internet, since the performance improvements found by Neubauer and colleagues (2013) were only marginally different from a control group and inconsistent across different BAT situations.

Overall Conclusions

Previous reviews (e.g., Rodebaugh et al., 2004) and meta-analyses (e.g., Acarturk, et al., 2009; Feske & Chambless, 1995; Powers, Sigmarsson, & Emmelkamp, 2008) have concluded that there are effective treatments for SAD. In this chapter, we examined whether there were differential effects for various treatments on certain aspects of SAD. A summary of the review appears in Table 23.1. Although overall, most treatments were helpful for most of the constructs we examined, some differences did emerge. Furthermore, some aspects of SAD have not been regularly assessed in treatment outcome studies, so final conclusions remain elusive. We will summarize what we can conclude with some confidence.

CBGT and exposure-alone appear to be helpful in decreasing physiological arousal, particularly heart rate. CBGT seems to produce changes in neurological activity that is consistent with neuroscience models of fear, as well. Two non-behavioral interventions—educational supportive group therapy and attention training—may also decrease physiological arousal, but this is based on only two studies. In addition, other treatments without a behavioral intervention do not appear particularly effective for reducing physiological symptoms, except in clients who are highly physiologically reactive at pre-treatment. The limited current evidence is not particularly supportive of SET in the reduction of physiological arousal either; however, because SET contains therapeutic elements that have been effective in other studies, future research may support it as well.

Overall, some of the best and most consistent treatment outcomes are found in the cognitive dimension of SAD. Beliefs, self-statements, judgment biases, and interpretation biases all appear to be quite responsive to most active treatments reviewed. Nevertheless, some cognitive aspects seem more amenable to change. Specifically, improvement appears to be more pronounced for beliefs that are closely related to social anxiety rather than more general irrational beliefs, presumably because the former are more likely to be targeted by treatment. In addition, reductions in negative self-statements seem to be more pronounced than increases in positive self-statements. Similarly, judgment biases (i.e., subjective probabilities) for aversive events seem more prone to change following treatment for SAD than those for pleasant events. For those who present with attention bias to threat, attention training may be useful, along with other psychosocial interventions, but further replication and differentiation of treatments is needed.

Like many of the cognitive aspects, fear of negative evaluation—thought to be the core feature—appears to respond to all of the interventions examined. Even those interventions conducted primarily via computer or virtual reality

TABLE 23.1 Overall Summary of Treatments by Intervention[a]

Dimension	Cognitive Intervention	Exposure Alone	Social Skills Training	Combined Exposure and Cognitive Intervention	Combined Exposure and Social Skills Training	Attention Training & Interpretation Training	Interpersonal Intervention
Physiology[b]	+/−	+	+/−	+/−	−	+	
Beliefs	+	+/−	+	+			+
Self-Statements	+/−	+/−	+	+	+		+
Judgment Bias	+	+	+	+			+
Interpretation Bias	+			+	+	+	
Attention bias[c]						+/−	
Fear of Negative Evaluation	+	+/−	+	+/−	+	+	+
Escape/Avoidance Behavior	+/−	+		+	−		
Performance Quality	−	+/−	+	+	+/−	+/−	

Note: + = Studies generally were supportive that this intervention yielded positive change on this dimension, which differs from a wait-list or attention control group (if available). +/− = Some studies indicate that this intervention yielded positive change on this dimension, but other studies found no change or a failure to differ from the wait-list or attention control group (if available). − = Studies generally failed to find this intervention yielded positive change on this dimension. A blank cell in the table indicates no studies are available.

[a]*See text of chapter for nuances such as important subgroups, number and quality of studies supporting a rating, and extent of change.*

[b]*Studies have generally supported neurological changes following CBGT, but too few treatment studies have examined neurology to include it within this table.*

[c]*Studies of behavioral and/or cognitive-behavioral interventions have generally supported positive change in attention bias among treatment responders; however, these studies have collapsed across interventions (including non-psychotherapy, like medication and self-help), preventing conclusions on any individual treatments besides attention training.*

seem effective. Furthermore, there is little evidence that individuals with certain characteristics respond more or less positively on fear of negative evaluation measures with a given intervention.

Finally, both exposure alone and combined treatments involving cognitive restructuring and exposure appear to be effective for reducing escape/avoidance behavior. Nevertheless, the combined treatments appear to be the best for improving overt behavioral performance, especially CBGT. Although social skills training does not seem to be an essential component and has little support as a lone intervention, it may enhance the effectiveness of multicomponent treatments, like CBGT and SET. Cognitive restructuring alone does not appear to be the treatment of choice to reduce behavioral avoidance or to improve performance.

Subgroups

Examination of subgroups of individuals diagnosed with SAD yielded some differential treatment recommendations. Behavioral reactors improved more on self-statements and performance quality when they received social skills training than when they received rational-emotive therapy. Socially anxious participants with high physiological reactivity may also benefit from social skills training, applied relaxation, or self-instructional training to reduce their arousal. Physiological reactors improved more on self-statements with self-instructional training than with applied relaxation alone. Individuals for whom irrational beliefs are particularly problematic (cognitive reactors), made progress on irrational beliefs with both a cognitive intervention and social skills training, a noncognitive intervention. However, social skills training, but not rational-emotive therapy, was effective in changing performance quality for cognitive reactors. There is little evidence that diagnostic subtype as previously defined or a status of APD impacted the effectiveness of treatment. More research is needed to determine whether the specific subtype, as defined in DSM-5 (APA, 2013) predicts treatment outcome across various dimensions and interventions.

Changes in Measures and Research Questions Over Time

In updating this review, it has become apparent that the types of measures used to assess treatment outcome have changed somewhat over time. Few of the most recent studies assessed physiological processes, such as heart rate or blood pressure. However, assessment of neurological changes appears to be becoming more common. With respect to cognition, early studies often emphasized measures of attributions and irrational beliefs that were not specific to SAD. Such measures tend to be absent from current studies that are more likely to assess core beliefs of individuals with SAD as well as judgment, interpretation, and attention biases. Recent studies still assess self-statements with some frequency, but seem to have shifted from using thought-listing measures to using thought

inventories for greater efficiency. Possibly also for the sake of greater efficiency, fewer recent outcome studies, with the exception of the attention modification paradigms, seem to have employed behavioral measures of escape/avoidance or performance quality, instead opting for self-report measures of avoidance and functional impairment, such as the Leibowitz Social Anxiety Scale (Liebowitz, 1987) and the Sheehan Disability Scale (Leon, Olfson, Portera, Faber, & Sheehan, 1997). Assessing fear of negative evaluation has been consistent over time, though most recent studies use the abbreviated BFNE.

Many early studies compared different treatments with different hypothesized mechanisms of action, such as cognitive therapy versus exposure therapy. The abundant evidence for the efficacy of exposure-based treatments has resulted in research questions that test whether adding certain components to exposure (such as social skills training) or conducting exposure in a different way within a different theoretical model (Clark's cognitive therapy) adds to the efficacy of treatment. Finally, several recent studies (e.g., Hofmann, 2004; Smits et al., 2006) have focused on hypothesized mechanisms of change (see Rodebaugh, Holaway, & Heimberg, 2004, for a review).

SUMMARY

This review has focused on how various treatments impact specific dimensions of SAD. As noted earlier, many reviews have compared which interventions are most effective in producing overall clinical improvement. It is hoped that practitioners may find this chapter useful in selecting a treatment when a particular dimension of SAD is prominent in the clinical presentation. At the same time, one might question whether certain dimensions must change before overall clinical improvement occurs. A full discussion of this issue is beyond the bounds of the chapter. However, it is worth noting that Mattick and colleagues (Mattick & Peters, 1988; Mattick et al., 1989) found that greater change in fear of negative evaluation was associated with a more positive treatment outcome. Additionally, multiple studies have suggested that change in probability and cost biases are important mechanisms of effective treatment (Foa et al., 1996; Smits et al., 2006; Taylor & Alden, 2008). On the other hand, change on some dimensions, such as behavioral avoidance, is typically defined as a key part of clinically significant change.

It is hoped that future studies will include more comprehensive assessment of the full range of symptoms of SAD with less reliance on self-report measures. A surprisingly small proportion of the studies of treatment of SAD have included a measure of overt behavior, such as performance quality or behavioral avoidance. Although these measures are more time-consuming to administer than self-report questionnaires, it is essential that an intervention not be judged successful unless it remediates any performance deficits or avoidance of feared situations. Despite a growing body of literature on cognitive processes, how attentional biases toward social-threat cues change over the course of treatment remains unclear

due to some inconsistent findings. Given the theoretical importance of cognitive processes, it is hoped that future treatment studies will continue to include these measures. Furthermore, physiological arousal provides an objective index of fear that does not rely on self-report and is a key part of SAD. However, few studies have included measures of physiological arousal despite improvements that make ambulatory monitoring more feasible. Thus, it is hoped that future research will take advantage of recent technological advances in measuring physiological change as well as neurological change after SAD treatment. Finally, a fourth dimension of SAD that has been largely neglected in treatment outcome research is the emotional dimension. Many studies have included measures of depression, likely due to the high comorbidity of SAD and depression (Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992). However, almost none have examined changes in affect more generally, despite the theoretical importance of positive and negative affect in explaining the distinct and overlapping features of anxiety and depression, respectively (Clark & Watson, 1991). Therefore, it is also hoped that future outcome research will incorporate measures of affect, so that any future editions of this review might make informed recommendations for treating clients with SAD with prominent negative affect.

ACKNOWLEDGMENTS

The authors wish to thank Leslie Cohn and Brandon Weiss for their contributions to earlier versions of this chapter.

REFERENCES

Acarturk, C., Cuijpers, P., van Straten, A., & de Graaf, R. (2009). Psychological treatment of social anxiety disorder: a meta-analysis. *Psychological Medicine*, *39*, 241–254. doi: 10.1017/S0033291708003590.

American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.) (DSM-III). Washington, DC: Author.

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., rev.) (DSM-III-R). Washington, DC: Author.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.) (DSM-IV). Washington, DC: Author.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.) (DSM-IV-TR). Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.) (DSM-5). Washington, DC: Author.

Amir, N., Beard, C., Taylor, C. T., Klumpp, H., Elias, J., Burns, M., & Chen, X. (2009). Attention training in individuals with generalized social phobia: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *77*, 961–973. doi: 10.1037/a0016685.

Amir, N., & Taylor, C. T. (2012). Interpretation training in individuals with generalized social anxiety disorder: A randomized controlled trial. *Journal of Clinical and Consulting Psychology*, *80*, 497–511. doi: 10.1037/a0026928.

Anderson, P. L., Zimand, E., Hodges, L. F., & Rothblaurn, B. O. (2005). Cognitive behavioral therapy for public-speaking anxiety using virtual reality for exposure. *Depression and Anxiety*, *22*, 156–158. doi: 10.1002/da.20090.

Beard, C., & Amir, N. (2009). Interpretation in social anxiety: When meaning precedes ambiguity. *Cognitive Therapy and Research*, *33*, 406–415. doi: 10.1007/s10608-009-9235-0.

Beard, C., Weisberg, R. B., & Amir, N. (2011). Combined cognitive bias modification treatment for social anxiety disorder: A pilot trial. *Depression and Anxiety*, *28*, 981–988. doi: 10.1002/da.20873.

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

Biran, M., Agusto, F., & Wilson, G. T. (1981). In vivo exposure vs. cognitive restructuring in the treatment of scriptophobia. *Behaviour Research and Therapy*, *19*, 525–532. doi: 10.1016/0005-7967(81)90079-6.

Bjornsson, A. S., Bidwell, L. C., Brosse, A. L., Carey, G., Hauser, M., Seghete, K. L. M., et al. (2011). Cognitive-behavioral group therapy versus group psychotherapy for social anxiety disorder among college students: A randomized controlled trial. *Depression and Anxiety*, *28*, 1034–1042. doi: 10.1002/da.20877.

Boden, M. T., John, O. P., Goldin, P. R., Werner, K., Heimberg, R. G., & Gross, J. J. (2012). The role of maladaptive beliefs in cognitive-behavioral therapy: Evidence from social anxiety disorder. *Behaviour Research and Therapy*, *50*, 287–291. doi: 10.1016/j.brat.2005.08.010.

Boettcher, J., Berger, T., & Renneberg, B. (2012). Internet-based attention training for social anxiety: A randomized controlled trial. *Cognitive Therapy & Research*, *36*, 522–536. doi: 10.1007/s10608-011-9374-y.

Bogels, S. M. (2006). Task concentration training versus applied relaxation, in combination with cognitive therapy, for social phobia patients with fear of blushing, trembling, and sweating. *Behaviour Research and Therapy*, *44*, 1199–1210. doi: 10.1016/j.brat.2005.08.010.

Bogels, S. M., & Reith, W. (1999). Validity of two questionnaires to assess social fears: The Dutch social phobia and anxiety inventory and the blushing, trembling, and sweating questionnaire. *Journal of Psychopathology and Behavioural Assessment*, *21*, 51–66. doi: 10.1023/A:1022812227606.

Bogels, S. M., Sijbers, G. F. V. M., & Voncken, M. (2006). Mindfulness and task concentration training for social phobia: A pilot study. *Journal of Cognitive Psychotherapy: An International Quarterly*, *20*, 33–44. doi: 10.1891/jcop.20.1.33.

Bohn, C., Aderka, I. A., Schreiber, F., Stangier, U., & Hofmann, S. G. (2013). Sudden gains in cognitive therapy and interpersonal therapy for social anxiety disorder. *Journal of Consulting and Clinical Psychology*, *81*, 177–182. doi: 10.1037/a0031198.

Borge, F., Hoffart, A., & Sexton, H. (2010). Predictors of outcome in residential cognitive and interpersonal treatment for social phobia: Do cognitive and social dysfunction moderate treatment outcome? *Journal of Behavior Therapy and Experimental Psychiatry*, *41*, 212–219. doi: 10.1016/j.jbtep.2010.01.005.

Borge, F., Hoffart, A., Sexton, H., Clark, D. M., Markowitz, J. C., & McManus, F. (2008). Residential cognitive therapy versus residential interpersonal therapy for social phobia: A randomized clinical trial. *Journal of Anxiety Disorders*, *22*, 991–1010. doi: 10.1016/j.janxdis.2007.10.002.

Borgeat, F., Stankovic, M., Khazaal, Y., Rouget, B. W., Baumann, M., Riquier, F., et al. (2009). Does the form or the amount of exposure make a difference in the cognitive-behavioral therapy treatment of social phobia? *The Journal of Nervous and Mental Disease*, *197*, 507–513. doi: 10.1097/NMD.0b013e3181aacc08.

Brown, E. J., Heimberg, R. G., & Juster, H. R. (1995). Social phobia subtype and avoidant personality disorder: Effect on severity of social phobia, impairment, and outcome of cognitive behavioral treatment. *Behavior Therapy*, *26*, 467–486. doi: 10.1016/S0005-7894(05)80095-4.

Butler, G. (1985). Exposure as a treatment for social phobia: Some instructive difficulties. *Behaviour Research and Therapy*, *23*, 651–657. doi: 10.1016/0005-7967(85)90060-9.

Butler, G. (1989). Issues in the application of cognitive and behavioral strategies to the treatment of social phobia. *Clinical Psychology Review*, *9*, 91–106.

Butler, G., Cullington, A., Munby, M., Amies, M., & Gelder, M. (1984). Exposure and anxiety management in the treatment of social phobia. *Journal of Consulting and Clinical Psychology*, *52*, 642–650. doi: 10.1037/0022-006X.52.4.642.

Butler, G., & Mathews, A. (1983). Cognitive processes in anxiety. *Advances in Behaviour Research & Therapy*, *5*, 51–62. doi: 10.1016/0146-6402(83)90015-2.

Cacioppo, J. T., Glass, C. R., & Merluzzi, T. V. (1979). Self-statements and self-evaluations: A cognitive-response analysis of heterosocial anxiety. *Cognitive Therapy and Research*, *3*, 249–262. doi: 10.1007/BF01185965.

Canton, J., Scott, K. M., & Glue, P. (2012). Optimal treatment of social phobia: Systematic review and meta-analyis. *Neuropsychiatric Disease and Treatment*, *8*, 203–215. doi: 10.2147/NDT.S23317.

Carlbring, P., Apelstrand, M., Sehlin, H., Amir, N., Rousseau, A., Hofmann, S. G., & Andersson, G. (2012). Internet-delivered attention bias modification training in individuals with social anxiety disorder – a double blind randomized controlled trial. *BMC Psychiatry*, *12*, 1–9. doi: 10.1186/1471-244X-12-66.

Clark, D. B., & Agras, W. S. (1991). The assessment and treatment of performance anxiety in musicians. *American Journal of Psychiatry*, *148*, 598–605.

Clark, D. M. (1997). *Cognitive therapy for social phobia: Some notes for therapists*. Unpublished manuscript.

Clark, D. M., Ehlers, A., Hackmann, A., McManus, F., Fennell, M., Grey, N., Waddington, L., & Wild, J. (2006). Cognitive therapy versus exposure and applied relaxation in social phobia: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *74*, 568–578. doi: 10.1037/0022-006X.74.3.568.

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

Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. In R. Heimberg, M. Liebowitz, D. A. Hope, & F. R. Schneier (Eds.), *Social phobia: Diagnosis, assessment, and treatment* (pp. 69–93). New York: Guilford Press.

Clark, D. M., Wells, A., Hackmann, A., Butler, G., & Fennell, M. J. U. (1994). *Measures of social phobia*. Unpublished. Oxford: University of Oxford.

Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric and taxonomic implications. *Journal of Abnormal Psychology*, *100*, 316–336. doi: 10.1037/0021-843X.100.3.316.

Connor, K. M., Davidson, J. R. T., Churchill, L. E., Sherwood, A., Foa, E. B., & Weisler, R. H. (2000). Psychometric properties of the social phobia inventory (SPIN): A new self-rating scale. *British Journal of Psychiatry*, *176*, 379–386. doi: 10.1192/bjp.176.4.379.

Cox, B. J., Ross, L., Swinson, R. P., & Direnfeld, D. M. (1998). A comparison of social phobia outcome measures in cognitive behavioral group therapy. *Behavioral Modification*, *22*, 285–297. doi: 10.1177/01454455980223004.

Dalrymple, K. L. (2012). Issues and controversies surrounding the diagnosis and treatment of social anxiety disorder. *Expert Review of Neurotherapeutics*, *12*(8), 993–1009doi: 10.1586/ern.12.81.

Dalrymple, K. L., & Herbert, J. D. (2007). Acceptance and commitment therapy for generalized social anxiety disorder: A pilot study. *Behavior Modification*, *31*, 543–568. doi: 10.1177/0145445507302037.

Davidson, R. J., Marshall, J. R., Tomarken, A. J., & Henriques, J. B. (2000). While a phobic waits: Regional brain electrical and autonomic activity in social phobics during anticipation of public speaking. *Biological Psychiatry*, *47*, 85–95. doi: 10.1016/S0006-3223(99)00222-X.

De Oliveira, I. R., Powell, V. B., Wenzel, A., Caldas, M., Seixas, C., Almeida, C., et al. (2012). Efficacy of the trial-based thought record, a new cognitive therapy strategy designed to change core beliefs, in social phobia. *Journal of Clinical Pharmacy and Therapeutics*, *37*, 328–334. doi: 10.1111/j.1365-2710.2011.01299.x.

Dodge, C. S., Hope, D. A., & Becker, R. E. (1988). Evaluation of the Social Interaction Self-Statement Test with a social phobic population. *Cognitive Therapy and Research*, *12*, 211–222. doi: 10.1007/BF01204932.

Ellis, A. (1962). *Reason and emotion in psychotherapy*. New York: Lyle Stuart.

Emmelkamp, P. M. G., Mersch, P. P., Vissia, E., & van der Helm, M. (1985). Social phobia: A comparative evaluation of cognitive and behavioral interventions. *Behaviour Research and Therapy*, *23*, 365–369. doi: 10.1016/0005-7967(85)90015-4.

Falloon, I. R. H., Lloyd, G. G., & Harpin, R. E. (1981). The treatment of social phobia: Real-life rehearsal with nonprofessional therapists. *Journal of Nervous and Mental Disease*, *169*, 180–184. doi: 10.1097/00005053-198103000-00005.

Fedoroff, I. C., & Taylor, S. (2001). Psychological and pharmacological treatments of social phobia: A meta-analysis. *Journal of Clinical Psychopharmacology*, *21*(3), 311–324doi: 10.1097/00004714-200106000-00011.

Feske, U., & Chambless, D. L. (1995). Cognitive behavioral versus exposure only treatment for social phobia: A meta-analysis. *Behavior Therapy*, *26*, 695–720. doi: 10.1016/S0005-7894(05)80040-1.

Fink, C. M., Turner, S. M., & Beidel, D. C. (1996). Culturally relevant factors in the behavioral treatment of social phobia: A case study. *Journal of Anxiety Disorders*, *10*, 201–209. doi: 10.1016/0887-6185(96)00005-9.

Foa, E. B., Franklin, M. E., & Kozak, M. J. (2001). Social phobia: An information processing perspective. In S. Hofmann, & P. M. DiBartolo (Eds.), *From social anxiety to social phobia: Multiple perspectives* (pp. 268–280). Needham, MA: Allyn & Bacon.

Foa, E. B., Franklin, M. E., Perry, K. J., & Herbert, J. D. (1996). Cognitive biases in generalized social phobia. *Journal of Abnormal Psychology*, *105*, 433–439. doi: 10.1037/0021-843X.105.3.433.

Franklin, M. E., Huppert, J., Langner, R., Leiberg, S., & Foa, E. B. (2005). Interpretation bias: A comparison of treated social phobics, untreated social phobics, and controls. *Cognitive Therapy and Research*, *29*, 289–300. doi: 10.1007/s10608-005-2412-8.

Furmark, T., Tillfors, M., Marteinsdottir, I., Fischer, H., Pissiota, A., Langstrom, B., et al. (2002). Common changes in cerebral blood flow in patients with social phobia treated with citalopram or cognitive-behavioral therapy. *Archives of General Psychiatry*, *59*, 425–433. doi: 10.1001/archpsyc.59.5.425.

Gaston, J. E., Abbott, M. J., Rapee, R. M., & Neary, S. A. (2006). Do empirically supported treatments generalize to private practice? A benchmark study of a cognitive-behavioural group treatment programme for social phobia. *British Journal of Clinical Psychology*, *45*, 33–48. doi: 10.1348/014466505X35146.

Gelernter, C. S., Uhde, T. W., Cimbolic, P., Arnkoff, D. B., Vittone, B. J., Tancer, M. E., & Bartko, J. J. (1991). Cognitive-behavioral and pharmacological treatment of social phobia: A controlled study. *Archives of General Psychiatry*, *48*, 938–945. doi: 10.1001/archpsyc.1991.01810340070009.

Gil, P. J. M., Carrillo, F. X. M., & Meca, J. S. (2001). Effectiveness of cognitive-behavioural treatment in social phobia: A meta-analytic review. *Psychology in Spain*, *5*(1), 17–25.

Glass, C. R., Merluzzi, T. V., Biever, J. L., & Larsen, K. H. (1982). Cognitive assessment of social anxiety: Development and validation of a self-statement questionnaire. *Cognitive Therapy and Research*, *6*, 37–55. doi: 10.1007/BF01185725.

Gould, R. A., Buckminster, S., Pollack, M. H., Otto, M. W., & Yap, L. (1997). Cognitive-behavioral and pharmacological treatment for social phobia: A meta-analysis. *Clinical Psychology: Science and Practice*, *4*, 291–306. doi: 10.1111/j.1468-2850.1997.tb00123.x.

Gruber, K., Moran, P. J., Roth, W. T., & Taylor, C. B. (2001). Computer-assisted cognitive behavioral group therapy for social phobia. *Behavior Therapy*, *32*, 155–165. doi: 10.1016/S0005-7894(01)80050-2.

Haug, T. T., Blomhoff, S., Hellstrom, K., Holme, I., Humble, M., Madsbu, H. P., & Wold, J. E. (2003). Exposure therapy and sertraline in social phobia: 1-year follow-up of a randomised controlled trial. *British Journal of Psychiatry*, *182*, 312–318. doi: 10.1192/bjp.182.4.312.

Heeren, A., Reese, H. E., McNally, R. J., & Philippot, P. (2012). Attention training toward and away from threat in social phobia: Effects on subjective, behavioral, and physiological measures of anxiety. *Behaviour Research and Therapy*, *50*, 30–39. doi: 10.1016/j.brat.2011.10.005.

Heimberg, R. G., Becker, R. E., Goldfinger, K., & Vermilyea, J. A. (1985). Treatment of social phobia by exposure, cognitive restructuring, and homework assignments. *Journal of Nervous and Mental Disease*, *173*, 236–245. doi: 10.1097/00005053-198504000-00006.

Heimberg, R. G., Dodge, C. S., & Becker, R. E. (1987). Social phobia. In L. Michelson, & L. M. Ascher (Eds.), *Anxiety and stress disorders: Cognitive-behavioral assessment and treatment*. New York: Guilford Press.

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

Heimberg, R. G., Liebowitz, M. R., Hope, D. A., Schneier, F. R., Holt, C. S., Welkowitz, L. A., Juster, H. R., Campeas, R., Bruch, M. A., Cloitre, M., Fallon, B., & Klein, D. F. (1998). Cognitive behavioral group therapy vs. phenelzine therapy for social phobia. *Archives of General Psychiatry*, *55*, 1133–1141. doi: 10.1001/archpsyc.55.12.1133.

Heimberg, R. G., Salzman, D., Holt, C. S., & Blendell, K. (1993). Cognitive behavioral group treatment of social phobia: Effectiveness at 5-year follow-up. *Cognitive Therapy and Research*, *17*, 325–329. doi: 10.1007/BF01177658.

Herbert, J. D., Guadiano, B. A., Rheingold, A. A., Myers, V. H., Dalrymple, K., & Nolan, E. (2005). Social skills training augments the effectiveness of cognitive behavioral group therapy for social anxiety disorder. *Behavior Therapy*, *36*, 125–138. doi: 10.1016/S0005-7894(05)80061-9.

Herbert, J. D., Rheingold, A. A., Guadiano, B. A., & Myers, V. H. (2004). Standard versus extended cognitive behavior therapy for social anxiety disorder: A randomized-controlled trial. *Behavioural and Cognitive Psychotherapy*, *32*, 131–147. doi: 10.1017/S1352465804001171.

Hofmann, S. G. (2004). Cognitive mediation of treatment change in social phobia. *Journal of Consulting and Clinical Psychology*, *72*, 392–399. doi: 10.1037/0022-006X.72.3.392.

Hofmann, S. G. (2013). Can fMRI be used to predict the course of treatment for social anxiety disorder? *Expert Review of Neurotherapeutics*, *13*(2), 123–125doi: 10.1586/ern.12.152.

Hofmann, S. G., & DiBartolo, P. M. (2000). An instrument to assess self-statements during public speaking: Scale development and preliminary psychometric properties. *Behavior Therapy*, *31*, 499–515. doi: 10.1016/S0005-7894(00)80027-1.

Hofmann, S. G., Moscovitch, D. A., Kim, Y., & Taylor, A. N. (2004). Changes in self-perception during treatment of social phobia. *Journal of Consulting and Clinical Psychology*, *72*, 588–596. doi: 10.1037/0022-006X.72.4.588.

Hofmann, S. G., Newman, M. G., Becker, E., Taylor, C. B., & Roth, W. T. (1995). Social phobia with and without avoidant personality disorder: Preliminary behavior therapy outcome findings. *Journal of Anxiety Disorders*, *9*, 427–438. doi: 10.1016/0887-6185(95)00022-G.

Hofmann, S. G., Schulz, S. M., Meuret, A. E., Moscovitch, D. A., & Suvak, M. (2006). Sudden gains during therapy of social phobia. *Journal of Consulting and Clinical Psychology*, *74*, 687–697. doi: 10.1037/0022-006X.74.4.687.

Hope, D. A., Burns, J., Hayes, S. A., Herbert, J., & Warner, M. D. (2010). Automatic thoughts and cognitive restructuring in cognitive-behavioral group therapy for social anxiety disorder. *Cognitive Therapy and Research*, *34*, 1–12. doi: 10.1007/s10608-007-9147-9.

Hope, D. A., Heimberg, R. G., & Bruch, M. A. (1995). Dismantling cognitive-behavioral group therapy for social phobia. *Behaviour Research and Therapy*, *33*, 637–650. doi: 10.1016/0005-7967(95)00013-N.

Hope, D. A., Heimberg, R. G., Juster, H. R., & Turk, C. (2000). *Managing Social Anxiety: A Cognitive-Behavioral Therapy Approach (Client Workbook)*. The Psychological Corporation.

Hope, D. A., Heimberg, R. G., & Turk, C. (2006). *Managing Social Anxiety: A Cognitive-Behavioral Therapy Approach (Therapist Guide)*. New York: Oxford University Press.

Hope, D. A., Herbert, J. D., & White, C. (1995). Diagnostic subtype, avoidant personality disorder, and efficacy of cognitive-behavioral group therapy for social phobia. *Cognitive Therapy and Research*, *19*, 399–417. doi: 10.1007/BF02230408.

Jerremalm, A., Jansson, L., & Öst, L. G. (1986). Cognitive and physiological reactivity and the effects of different behavioral methods in the treatment of social phobia. *Behaviour Research and Therapy*, *24*, 171–180. doi: 10.1016/0005-7967(86)90088-4.

Jones, R. G. (1969). A factored measure of Ellis' rational beliefs system with personality and maladjustment correlates. *Dissertation Abstracts International*, *29*, 4379B–4380B (University Microfilms No. 69-64443).

Koopmans, P. C., Sanderman, R., Timmerman, G. H., & Emmelkamp, P. M. G. (1994). The irrational beliefs inventory: Development and psychometric evaluation. *European Journal of Psychological Assessment*, *10*, 15–27.

Leary, M. R. (1983). A brief version of the fear of negative evaluation scale. *Personality and Social Psychology Bulletin*, *9*, 371–375. doi: 10.1177/0146167283093007.

Ledley, D. R., Heimberg, R. G., Hope, D. A., Hayes, S. A., Zaider, T. I., Dyke, M. V., et al. (2009). Efficacy of a manualized and workbook-driven individual treatment for social anxiety disorder. *Behavior Therapy*, *40*, 414–424. doi: 10.1016/j.beth.2008.12.001.

Leon, A. C., Olfson, M., Portera, L., Farber, L., & Sheehan, D. V. (1997). Assessing psychiatric impairment in primary care with Sheehan Disability Scale. *International Journal of Psychiatry in Medicine*, *27*, 93–105. doi: 10.2190/T8EM-C8YH-373N-1UWD.

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

Liebowitz, M. R., Heimberg, R. G., Schneier, F. R., Hope, D. A., Davies, S., Holt, C. S., Goetz, D., Juster, H. R., Lin, S., Bruch, M. A., Marshall, R. D., & Klein, D. F. (1998). Cognitive-behavioral group therapy versus phenelzine in social phobia: Long-term outcome. *Depression and Anxiety*, *10*, 89–98. doi: 10.1002/(SICI)1520-6394(1999)10:3 < 89::AID-DA1 > 3.0.CO;2-5.

Lipsitz, J. D., Gur, M., Vermes, D., Petkova, E., Cheng, J., Miller, N., et al. (2008). A randomized trial of interpersonal therapy versus supportive therapy for social anxiety disorder. *Depression and Anxiety*, *25*, 542–553. doi: 10.1002/da.20364.

Lucock, M. P., & Salkovskis, P. M. (1988). Cognitive factors in social anxiety and its treatment. *Behaviour Research and Therapy*, *14*, 225–238.

Lundh, L., & Ost, L. (2001). Attentional bias, self-consciousness, and perfectionism in social phobia before and after cognitive-behaviour therapy. *Scandinavian Journal of Behaviour Therapy*, *30*, 4–16.

MacLeod, C., Mathews, A., & Tata, P. (1986). Attentional bias in emotional disorders, *Journal of Abormal Psychology*, *95*, 15–20. doi: 10.1037/0021-843X.95.1.15.

Mathewson, K. J., Schmidt, L. A., Miskovic, V., Santesso, D. L., Duku, E., McCabe, R. E., Antony, M. M., et al. (2013). Does respiratory sinus arrhythmia (RSA) predict anxiety reduction during cognitive behavioral therapy (CBT) for social anxiety disorder (SAD)? *International Journal of Psychophysiology*, *88*, 171–181. doi: 10.1016/j.ijpsycho.2013.03.016.

Mattia, J. I., Heimberg, R. G., & Hope, D. A. (1993). The revised Stroop color-naming task in social phobics. *Behaviour Research and Therapy*, *31*, 305–313. doi: 10.1016/0005-7967(93)90029-T.

Mattick, R. P., & Peters, L. (1988). Treatment of severe social phobia: Effects of guided exposure with and without cognitive restructuring. *Journal of Consulting and Clinical Psychology*, *56*, 251–260. doi: 10.1037/0022-006X.56.2.251.

Mattick, R. P., Peters, L., & Clarke, J. C. (1989). Exposure and cognitive restructuring for social phobia: A controlled study. *Behavior Therapy*, *20*, 3–23. doi: 10.1016/S0005-7894(89)80115-7.

McManus, F., Clark, D. M., & Hackmann, A. (2000). Specificity of cognitive biases in social phobia and their role in recovery. *Behavioral and Cognitive Psychotherapy*, *28*, 201–209. doi: 10.1017/S1352465800003015.

Meier, V. J., & Hope, D. A. (1998). Assessment of social skills. In A. S. Bellack, & M. Hersen (Eds.), *Behavioral assessment: A practical handbook* (pp. 232–255). Needham Heights, MA: Allyn & Bacon.

Mersch, P. P. A. (1995). The treatment of social phobia: The differential effectiveness of exposure *in vivo* and an integration of exposure *in vivo*, rational emotive therapy, and social skills training. *Behaviour Research and Therapy*, *33*, 259–269. doi: 10.1016/0005-7967(94)00038-L.

Mersch, P. P. A., Bögels, S. M., Hofmann, A., van Hout, W. J. P. J., Scholing, A., & Arntz, A. R. (1996). Construction and validation of the social anxiety self-statements inventory (SASSI). *Unpublished manuscipt*.

Mersch, P. P. A., Emmelkamp, P. M. G., Bögels, S. M., & van der Sleen, J. (1989). Social phobia: Individual response patterns and the effects of behavioral and cognitive interventions. *Behaviour Research and Therapy*, *27*, 421–434. doi: 10.1016/0005-7967(89)90013-2.

Mersch, P. P. A., Jansen, M. A., & Arntz, A. (1995). Social phobia and personality disorder: Severity of complaint and treatment effectiveness. *Journal of Personality Disorders*, *9*, 143–159. doi: 10.1521/pedi.1995.9.2.143.

Miskovic, V., Ashbaugh, A. R., Santesso, D. L., McCabe, R. E., Antony, M. M., & Schmidt, L. A. (2010). Frontal brain oscillations and social anxiety: A cross-frequency spectral analysis during baseline and speech anticipation. *Biological Psychology*, *83*, 125–132. doi: 10.1016/j.biopsycho.2009.11.010.

Miskovic, V., Moscovitch, D. A., Santesso, D. L., McCabe, R. E., Antony, M. M., & Schmidt, L. A. (2011). Changes in EEG cross-frequency coupling during cognitive behavioral therapy for social anxiety disorder. *Psychological Science*, *22*(4), 507–516. doi: 10.1177/0956797611400914.

Mortberg, E., Clark, D. M., & Bejerot, S. (2011). Intensive group cognitive therapy and individual cognitive therapy for social phobia: Sustained improvement at 5-year follow-up. *Journal of Anxiety Disorder*, *25*, 994–1000. doi: 10.1016/j.janxdis.2011.06.007.

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

Mortberg, E., Karlsson, A., Fyring, C., & Sundin, O. (2006). Intensive cognitive-behavioral group treatment (CBGT) of social phobia: A randomized controlled study. *Journal of Anxiety Disorders*, *20*, 646–660. doi: 10.1016/j.janxdis.2005.07.005.

Moscovitch, D. A., Gavric, D. L., Senn, J. M., Santesso, D. L., Miskovic, V., Schmidt, L. A., et al. (2012). Changes in judgment biases and use of emotion regulation strategies during cognitive-behavioral therapy for social anxiety disorder: Distinguishing treatment responders from non-responders. *Cognitive Therapy and Research*, *36*, 261–271. doi: 10.1007/s10608-011-9371-1.

Moscovitch, D. A., Santesso, D. L., Miskovic, V., McCabe, R. E., Antony, M. M., & Schmidt, L. A. (2011). Frontal EEG asymmetry and symptom response in cognitive behavioral therapy in patients with social anxiety disorder. *Biological Psychology*, *87*, 379–385. doi: 10.1016/j.biopsycho.2011.04.009.

Neubauer, K., von Auer, M., Murray, E., Petermann, F., Helbig-Lang, S., & Gerlach, A. L. (2013). Internet-delivered attention modification training as a treatment for social phobia: A randomized controlled trial. *Behaviour Research and Therapy*, *51*, 87–97. doi: 10.1016/j.brat.2012.10.006.

Newman, M. G., Hofmann, S. G., Trabert, W., Roth, W. T., & Taylor, C. B. (1994). Does behavioral treatment of social phobia lead to cognitive changes? *Behavior Therapy*, *25*, 503–517.

Nortje, C., & Posthumus, T. (2012). Scores on an emotional Stroop task after treatment on social anxiety disorder. *Psychological Reports: Mental & Physical Health*, *111*, 461–471. doi: 10.1016/S0005-7894(05)80160-1.

Nortje, C., Posthumus, T., & Moller, A. T. (2008). Comparison of integrated cognitive restructuring plus exposure with exposure alone in group treatment of generalized social anxiety disorder. *South African Journal of Psychology*, *38*, 647–658. doi: 10.1177/008124630803800405.

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

Norton, P. J., & Hope, D. A. (2001b). Kernels of truth or distorted perceptions: Self and observer ratings of social anxiety and performance. *Behavior Therapy*, *32*, 765–786. doi: 10.1016/S0005-7894(01)80020-4.

Öst, L. G. (1987). Applied relaxation: Description of a coping technique and review. *Behaviour Research and Therapy*, *23*, 397–409. doi: 10.1016/0005-7967(87)90017-9.

Öst, L. G., Jerremalm, A., & Johansson, J. (1981). Individual response patterns and the effects of different behavioral methods in the treatment of social phobia. *Behaviour Research and Therapy*, *19*, 1–16. doi: 10.1016/0005-7967(81)90107-8.

Posner, M. I. (1980). Orienting of attention. *Quarterly Journal of Experimental Psychology*, *32A*, 3–25. doi: 10.1080/00335558008248231.

Powers, M. B., Sigmarsson, S. R., & Emmelkamp, P. M. G. (2008). A meta-analytic review of psychological treatments for social anxiety disorder. *International Journal of Cognitive Therapy*, *1*, 94–113. doi: 10.1521/ijct.2008.1.2.94.

Price, M., & Anderson, P. L. (2011). Latent growth curve analysis of fear during a speech task before and after treatment for social phobia. *Behaviour Research and Therapy*, *490*, 763–770. doi: 10.1016/j.brat.2011.08.004.

Price, M., & Anderson, P. L. (2012). Outcome expectancy as a predictor of treatment response in cognitive behavioral therapy for public speaking fears within social anxiety disorder. *Psychotherapy*, *49*, 173–179. doi: 10.1037/a0024734.

Rapee, R. M. (1995). Descriptive psychopathology of social phobia. In R. G. Heimberg, L. R. Liebowitz, D. A. Hope, & F. R. Schneier (Eds.), *Social phobia: Diagnosis, assessment, and treatment* (pp. 41–68). New York: Guilford Press.

Rapee, R. M., Gaston, J. E., & Abbott, M. J. (2009). Testing the efficacy of theoretically derived improvements in treatment of social phobia. *Journal of Consulting and Clinical Psychology*, *77*, 317–327. doi: 10.1037/a0014800.

Rapee, R. M., MacLeod, C., Carpenter, L., Gaston, J. E., Frei, J., Peters, L., & Baillie, A. J. (2013). Integrating cognitive bias modification into a standard cognitive behavioural treatment package for social phobia: A randomized controlled trial. *Behaviour Research and Therapy*, *51*, 207–215. doi: 10.1016/j.brat.2013.01.005.

Rapee, R. M., & Sanderson, W. C. (1998). *Social Phobia: Clinical application of evidence-based psychotherapy*. New Jersey: Jason Aronson.

Robillard, G., Bouchard, S., Dumoulin, S., & Guitard, T. (2010). Using virtual humans to alleviate social anxiety: Preliminary report from a comparative outcome study. *Annual Review of CyberTherapy and Telemedicine*, *8*, 46–48.

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

Salaberria, K., & Echeburua, E. (1998). Long-term outcome of cognitive therapy's contribution to self-exposure *in vivo* to the treatment of generalized social phobia. *Behavior Modification*, *22*, 262–284. doi: 10.1177/01454455980223003.

Schneier, F. R., Johnson, J., Hornig, C. D., Liebowitz, M. R., & Weissman, M. M. (1992). Social phobia: Comorbidity and morbidity in an epidemiological sample. *Archives of General Psychiatry*, *55*, 322–331. doi: 10.1001/archpsyc.1992.01820040034004.

Scholing, A., & Emmelkamp, P. M. G. (1993a). Cognitive and behavioural treatments of fear of blushing, sweating, or trembling. *Behaviour Research and Therapy*, *31*, 155–170. doi: 10.1016/0005-7967(93)90067-5.

Scholing, A., & Emmelkamp, P. M. G. (1993b). Exposure with and without cognitive therapy for generalized social phobia: Effects of individual and group treatment. *Behaviour Research and Therapy*, *31*, 667–681. doi: 10.1016/0005-7967(93)90120-J.

Scholing, A., & Emmelkamp, P. M. G. (1996a). Treatment of fear of blushing, sweating, or trembling: Results at long-term follow-up. *Behavior Modification*, *20*, 338–356. doi: 10.1177/01454455960203006.

Scholing, A., & Emmelkamp, P. M. G. (1996b). Treatment of generalized social phobia: Results at long-term follow-up. *Behaviour Research and Therapy*, *34*, 447–452. doi: 10.1016/0005-7967(96)00010-1.

Shorkey, C. T., & Whiteman, V. L. (1977). Development of the rational behavior inventory: Initial validity and reliability. *Educational and Psychological Measurement*, *37*, 527–534. doi: 10.1177/001316447703700232.

Smits, J. A. J., Rosenfield, D., McDonald, R., & Telch, M. J. (2006). Cognitive mechanisms of social anxiety reduction: An examination of specificity and temporality. *Journal of Consulting and Clinical Psychology*, *74*, 1203–1212. doi: 10.1037/0022-006X.74.6.1203.

Steptoe, A., & Fidler, H. (1987). Stage fright in orchestral musicians: A study of cognitive and behavioral strategies in performance anxiety. *British Journal of Psychology*, *78*, 241–249. doi: 10.1111/j.2044-8295.1987.tb02243.x.

Stopa, L., & Clark, D. M. (1993). Cognitive processes in social phobia. *Behaviour Research and Therapy*, *31*, 255–267. doi: 10.1016/0005-7967(93)90024-O.

Stopa, L., Thorne, P., Waters, A., & Preston, J. (2001). Are the short and long forms of the Young Schema Questionnaire comparable and how well does each version predict psychopathology scores? *Journal of Cognitive Psychotherapy: An International Quaterly*, *15*, 253–272.

Stravynski, A., Marks, I., & Yule, W. (1982). Social skills problems in neurotic outpatients: Social skills training with and without cognitive modification. *Archives of General Psychiatry*, *39*, 1378–1385. doi: 10.1001/archpsyc.1982.04290120014003.

Taylor, C. T., & Alden, L. E. (2008). Self-related and interpersonal judgment biases in social anxiety disorder: Changes during treatment and relationship to outcome. *International Journal of Cognitive Therapy*, *1*, 125–137. doi: 10.1521/ijct.2008.1.2.125.

Taylor, S., Woody, S., Koch, W. J., McLean, P., Paterson, R. J., & Anderson, K. W. (1997). Cognitive restructuring in the treatment of social phobia. *Behavior Modification*, *21*, 487–511. doi: 10.1177/01454455970214006.

Telch, M. J., Lucas, R. A., Smits, J. A. J., Powers, M. B., Heimberg, R., & Hart, T. (2004). Appraisal of social concerns: A cognitive assessment instrument for social phobia. *Depression and Anxiety*, *19*, 217–224. doi: 10.1002/da.20004.

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

Turner, S. M., Beidel, D. C., Cooley, M. R., Woody, S. R., & Messer, S. C. (1994). A multicomponent behavioral treatment for social phobia: Social effectiveness therapy. *Behaviour Research and Therapy*, *32*, 381–390. doi: 10.1016/0005-7967(94)90001-9.

Turner, S. M., Beidel, D. C., & Jacob, R. G. (1994). Social phobia: A comparison of behavior therapy and atenolol. *Journal of Consulting and Clinical Psychology*, *62*, 350–358. doi: 10.1037/0022-006X.62.2.350.

Van Peer, J. M., Roelofs, K., & Spinhoven, P. (2008). Cortisoal administration enhances the coupling of midfrontal delta and beta oscillations. *International Journal of Psychophysiology*, *67*, 144–150. doi: 10.1016/j.ijpsycho.2007.11.001.

Voncken, M. J., & Bogels, S. M. (2006). Changing interpretation and judgmental bias in social phobia: A pilot study of a short, highly structured cognitive treatment. *Journal of Cognitive Psychotherapy: An International Quarterly*, *20*, 59–73. doi: 10.1891/jcop.20.1.59.

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

Wilson, J. K., & Rapee, R. M. (2005a). The interpretation of negative social events in social phobia: Changes during treatment and relationship to outcome. *Behaviour Research and Therapy*, *43*, 373–389. doi: 10.1016/j.brat.2004.02.006.

Wilson, J. K., & Rapee, R. M. (2005b). The interpretation of negative social events in social phobia with versus without comorbid mood disorder. *Journal of Anxiety Disorders*, *19*, 245–274. doi: 10.1016/j.janxdis.2004.03.003.

Wolpe, J., & Lang, P. J. (1964). A fear schedule for use in behavior therapy. *Behaviour Research and Therapy*, *2*, 27–30. doi: 10.1016/0005-7967(64)90051-8.

Woody, S. R., Chambless, D. L., & Glass, C. R. (1997). Self-focused attention in the treatment of social phobia. *Behavior Research and Therapy*, *35*, 117–129. doi: 10.1016/S0005-7967(96)00084-8.

Yuen, E. K., Herbert, J. D., Forman, E. M., Goetter, E. M., Comer, R., & Bradley, J. (2013). Treatment of social anxiety disorder using online virtual environments in Second Life. *Behavior Therapy*, *44*, 51–61. doi: 10.1016/j.beth.2012.06.001.