CORRECTING SELF-DEPRECATING BIAS IN SOCIAL ANXIETY

by

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(Under the Direction of Steven R. H. Beach and Nader Amir)

ABSTRACT

Social anxiety is correlated with external attributions for positive social events and internal, stable attributions for negative social events (Taylor & Wald, 2003). A computerized retraining program was designed to modify this self-deprecating attributional style. Effects of this modification on state anxiety experienced during a subsequent speech task were examined. One hundred and two undergraduates were randomly assigned to a placebo or training condition. The training group was encouraged to attribute both social failures and successes to effort, while self-deprecating attributions were discouraged. Results suggest the training modified attributions on both a computerized assessment and the Attributional Style Questionnaire for Social Events (ASQSE; Taylor et al., 1997; Peterson et al., 1982). However, the training did not reduce state anxiety on the speech task. Results suggest although attributions may be modified in a single session, perhaps a longer duration and further experiences are required for these modifications to reduce anxiety.

INDEX WORDS: Social Anxiety, Attributions, Self-Deprecating Bias, Attribution Retraining
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CHAPTER 1
INTRODUCTION

Occurring at a lifetime prevalence of 13.3% (Kessler, et al., 1994), Social Phobia is one of the most prevalent psychiatric illnesses. Generalized Social Phobia (GSP) is described in the Diagnostic and Statistical Manual-IV-TR (DSM-IV-TR APA, 1994, p. 450-451) as distressing and/or impairing fear of most social situations. Although clinicians had at one time underestimated the consequences of GSP, more recent evidence suggests that GSP is associated with decreased life satisfaction (Eng, Coles, Heimberg, & Safren, 2005), underemployment (Bruch, Fallon, & Heimberg, 2003), and suicide attempts (Katzelnick et al., 2001). Current treatments for GSP are cause for further concern, as approximately 40% of treatment-seeking individuals do not respond (39% Heimberg, et al., 1998; 42%, Liebowitz, Gelenberg, & Munjack, 2005). In short, GSP is a common yet serious psychiatric disorder for which more effective treatments are still required.

Several approaches to GSP have provided fruitful models and therapeutic interventions. These include cognitive, biological, and information processing approaches. This study focuses on interpretation bias, which along with attention and memory bias comprises the information processing approach in GSP (Clark & McManus, 2002). Research suggests that interpretation bias is correlated with GSP. However, few studies have attempted to change this bias. This study examines attribution retraining as a new, and possibly more efficacious, method of altering interpretation of social events. Attribution retraining focuses on cost interpretations of actual
positive and negative events, and so may more directly influence hypothesized interpretation deficits in individuals with GSP.

*Interpretations in GSP*

Interpretation bias is associated with social anxiety (e.g., Stopa & Clark, 2000; Amir, Beard, & Bower, 2005). For example, Stopa & Clark (2000) found that when given ambiguous social scenarios (e.g., “You see a group of friends having lunch, they stop talking when you approach”) and differing interpretations of the scenario (e.g., “They are about to ask you to join” versus “They were saying negative things about you” versus “They just ended their conversation”), individuals with social anxiety were more likely to endorse negative interpretations. These negative interpretations may increase socially anxious individuals’ symptoms, as induced negative interpretation bias has been shown to lead to increased state anxiety (Mathews & Mackintosh, 2000). These authors provided their participants with ambiguous social scenarios ending with a word that disambiguated the situation in either a positive or negative way (e.g., “Your partner asks you to go to an anniversary dinner that their company is holding. You have not met any of their work colleagues before. Getting ready to go, you think that the new people you will meet will find you boring/friendly”). When participants had to generate this interpretation themselves (e.g., infer that bo___g meant ‘boring’), and the majority of the disambiguating words were negative, their interpretations became more negative in a subsequent task and their state anxiety increased relative to baseline. Due to its malleability and effect on anxiety, interpretation seems to be a candidate mechanism to target in treatment of social anxiety.

These interpretation studies have focused on probability estimations; they measure interpretations of ambiguous social information as predictive or indicative of a benign or
threatening social event. Although results have been promising, another major issue for individuals with GSP may be their cost estimates for actual negative and positive social events. Cognitive therapy often involves helping socially anxious individuals realize that negative events, even if they do occur, would not necessarily have disastrous effects on a person’s life or implications for their personal worth. Foa, Franklin, Perry, and Herbert (1996) examined the role of both probability and cost estimates in social phobia treatment outcome. At pre-treatment, patients with GSP rated negative social situations as both more probable and more “bad” (i.e., costly) than non-anxious controls. However, social anxiety symptom change after cognitive-behavioral treatment was mediated by change in cost estimates rather than change in probability estimates. This suggests that clients who continue to fear an event, even of low probability, may experience residual symptoms.

A new measure of cost interpretation of negative social situations, the Consequences of Negative Social Events Questionnaire (CONSE-Q; Wilson & Rapee, 2005a), more specifically examined the type of cost most important in social anxiety. Notably, one of the scales on this measure was associated with symptom reduction at 3-month follow-up (Wilson & Rapee, 2005b). This scale measured the degree to which participants interpreted negative social events as meaning something negative about themselves (i.e., “I am a foolish person”). As I will next discuss, this type of interpretation may be more specifically categorized as an attribution.

What are Attributions?

Attributional style is a form of interpretation. Attributions are explanations for events. Weiner (1986) describes attributions along three dimensions. These include whether the locus of causality is due to the self (internal versus external), whether the causes remain the same (stable versus unstable), and whether the causes are controlled by the self (controllable versus
uncontrollable). For example, if an individual throws a party and the guests leave earlier than expected, some of the possible attributions are internal-stable-uncontrollable (e.g., “I am boring”), internal-unstable-controllable (e.g., “I didn’t make enough of an effort to introduce everyone”), external-stable-uncontrollable (e.g., “The guests have families and cannot stay out late”), or external-unstable-uncontrollable (e.g., “The guests were tired tonight”).

**Attributional Biases in Normal Populations**

Self-serving bias (SSB) is defined by Campbell and Sedikides (1999, p. 23) as “the explanatory pattern that involves external attributions (e.g. task difficulty, luck, or uncooperative others) for outcomes that disfavor the self but internal attributions (e.g. one’s own ability, effort, or determination) for outcomes that favor the self.”

Theorists have posited that SSB is related to the information brought to bear on the problem rather than ego-protection in and of itself. Anderson’s (1991) two-stage model of attribution indicates that during the first “problem formulation” stage, possible attributions for the situations are produced and “knowledge structures” pertaining to these attributions are used to evaluate them. Anderson proposed differential activation of these knowledge structures depending on priming and instruction; individuals have “given” SSB to another individual under experimental manipulations of this nature.

SSB is exaggerated in aggressive children (see William, 1997 for a review). Exaggerated SSB is also found in undergraduates with elevated narcissistic, histrionic, and obsessive-compulsive personality characteristics via increased external attributions for failure. SSB was attenuated in undergraduates reporting avoidant and dependent symptoms via more internal attributions for failure. These findings suggest an optimal range for SSB (McAllister, Baker, & Mannes, 2002).
Attributional Biases in GSP

Studies have shown that socially anxious individuals demonstrate a reversal of the SSB common in non-anxious controls (Hope, Gansler, & Heimberg, 1989). In other words, socially anxious people are more likely to attribute social failures to internal causes such as poor ability; they are also more likely to attribute social successes to external factors rather than their own social ability. Thus, socially anxious individuals avoid taking credit for social successes while at the same time assuming personal responsibility for social failures. Taylor and Wald (2003) found that compared to individuals with panic disorder with agoraphobia or posttraumatic stress disorder, individuals with social anxiety disorder made less internal attributions for positive social events, and more stable attributions for negative social situations; there was also a trend for the socially anxious group to make more internal attributions for negative social situations. Thus, the relationship between social anxiety and attributions is specific to the clinical group of socially anxious individuals.

In this study, however, some of the participants with panic disorder and posttraumatic stress disorder also had secondary diagnoses of social anxiety disorder and perhaps this weakened between-group differences. Correlations between a measure of social anxiety symptoms (i.e., the Social Phobia and Anxiety Inventory (SPAI): Turner, Beidel, Dancu, & Stanley, 1989) and an attribution style questionnaire revealed that social anxiety correlated with external attributions for positive social events and internal, stable attributions for negative social events. These correlations held even when controlling for levels of general anxiety and depression. These results provide strong support for a self-deprecating attributional bias (SDB) specific to clinical levels of social anxiety. These authors utilized the Attributional Style Questionnaire for Social Events (Taylor et al., 1997; Peterson et al., 1982) to measure
participants’ attributational styles. This measure lists three negative and three positive social situations. For each situation, the participant must describe one of the main causes they perceive and then rate that cause on scales of internality and stability.

Other studies have found an association between SDB and sub-clinical social anxiety or shyness (Johnson, Petzel, & Johnson, 1991; Johnson, Aikman, Danner, & Elling, 1995; Anderson & Arnoult, 1985; Teglasi & Hoffman, 1982) and low social self-esteem (Girodo, Dotzenroth, & Stein, 1981; Alden, 1986). Stability has also arisen as a factor involved in the attributional style of socially anxious individuals (Anderson & Arnoult, 1985; Teglasi & Hoffman, 1982). Additionally, studies have supported an association between social anxiety or shyness and decreased controllable attributions for both negative (Bruch & Belkin, 2001) and positive social events (Bruch & Pearl, 1995; Anderson & Arnoult, 1985). Thus, perceived internality, stability, and controllability of social successes and failures have all been correlated with social anxiety. Notably, socially anxious individuals do not show this bias toward achievement events (Anderson & Arnoult, 1985; Bruch & Belkin, 2001). Thus, SDB in social anxiety appears to be a different attribution bias than that found in depression, wherein noninterpersonal events are also implicated (Anderson & Arnoult, 1985). Shy persons do not seem to make different attributions for close relationship situations, again demonstrating the specificity of this bias to the kinds of situations distressing to shy individuals (Teglasi & Hoffman, 1982).

Most of the studies reviewed required participants to generate attributions for given social scenarios. However, Alden (1986) asked participants to make attributions to bogus feedback from a social interaction and also found evidence of an SDB. Also, Lake & Arkin (1985) demonstrated SDB in attributions for bogus feedback on a test purportedly measuring social
insight. Thus, it seems that SDB is found not only for researcher-generated social scenarios, but also for attributions concerning actual behavioral performance.

SDB has been associated not only with social anxiety, but also with behavioral outcomes. Bruch and Pearl (1995) correlated attributional style for heterosocial conversation initiation with actual behavioral observations during the same type of heterosocial interaction. Participants endorsing more internal attributions for failed interactions reported greater anxiety during the interactions. Internal attributions for success interactions, however, were associated with less anxiety during the interaction. Also, attributing both failed and successful social encounters to controllable causes was associated with less subjective anxiety. Controllable attributions for failed situations were associated with an adaptive thought pattern during the interaction. Thus, internality and control seemed particularly important to various behavioral outcomes.

Anderson and Arnoult (1985) concluded that controllability and internality were the most important attribution dimensions involved in shyness, loneliness, and depression, and that stability correlations with these “problems in living” were simply a result of this dimension intercorrelating with controllability and internality. These findings as well as those of Bruch and Pearl (1995) support the hypothesis that internality and controllability are the most important attributional dimensions in shyness. Furthermore, lack of controllability (i.e., choosing ability or trait explanations versus strategy or effort explanations) on failure situations also predicted loneliness (see Anderson, Jennings, & Arnoult, 1988 for a review).

Attribution bias operates at critical time points. For healthy populations, SSB is strongest in self-threatening contexts and when the task is considered important (Campbell & Sedikides, 1999). However, Coles, Turk, Heimberg, and Fresco (2001) found that when socially anxious patients recalled high and medium anxious social situations, their attributions for their
performance became more internal and stable while control participants attributed highly anxious situations less to internal, stable factors. Thus, during their most anxious moments, socially anxious individuals are even more likely to exhibit SDB which, presumably, helps maintain social anxiety disorder.

Teglasi and Fagin (1984) found that SDB is not present if socially anxious individuals have to choose attributions for situations involving other people, but the bias becomes evident for situations involving the self. However, the socially anxious group rated the negative situations as more likely for both themselves and others than did the non-anxious group. Thus, expectancies were not a determinant of attributional style in this socially anxious group. This finding demonstrates a divergence between the concepts of probability and cost, and suggests that cost may be a promising addition to information processing experiments in social anxiety.

*Mechanisms underlying Attribution Style*

Given the role of attribution abnormalities in individuals with social anxiety, there is a need to identify the mechanisms responsible for this bias. Hope, Gansler, & Heimberg (1989) review studies that support a relationship between self-focus and internal attributions; they proposed that the excessive self-focus may promote internal attributions.

SDB in social anxiety may also be due to social self-efficacy (see Alden, 1986, for a review). For example, Alden and Wallace (1995) found that participants with GSP discounted their social ability to the same extent whether their interaction partner behaved in positive or negative ways. Since the GSPs' observed behavior was more skilled in the positive interactions, this indicates that neither partner behavior nor their own behavioral improvements ameliorate their tendency to underestimate their social abilities. Conversely, they displayed a positive bias in assessing their interaction partner’s warmth, friendliness, talkativeness, and self-disclosure.
Thus, socially anxious individuals perceive positive responses in others to their own behavior, which they view as incompetent. These perceptions seem likely to lead to external attributions for social success.

**Attribution Assessment Methodology**

Most attribution assessment studies have used self-report measures. In those studies participants must generate one major cause of a given interpersonal situation and then rate that cause on various attribution dimensions. However, SDB has also been supported using researcher categorization of generated attributions (Teglasi & Hoffman, 1982) and forced-choice paradigms (Girodo et al., 1981).

**Manipulating Attribution Bias**

Attributions are malleable via therapy; Taylor et al. (1997) found that cognitive restructuring for generalized social phobia was associated with a .92 effect size in decreasing internal attributions for negative social events. Attributions are also malleable with social skills training, group exposure, and individual exposure treatments (Wlazlo, Schroeder-Hartwig, Hand, Kaiser, & Münchau, 1990).

Furthermore, attributional styles are responsive to experimental manipulation, wherein participants are told that either abilities or strategies determine success in the task at hand. For example, Jennings (1980) asked participants to create radio broadcasts persuading people to donate blood to the Red Cross. In the internal, uncontrollable condition, the experimenter stated that “persuading people…is a task in which abilities determine a volunteer’s success or failure.” In the internal, controllable condition, the experimenter stated that strategies determine success or failure. In the control condition, the experimenter stated that “no one in the Red Cross really knows why some volunteers are more successful than others.” In the control condition,
participants’ existing attributional style was measured. Participants who were encouraged to use controllable attributions, along with those in the control condition who naturally had a controllable attribution style, demonstrated improved success expectancies, variation of strategies employed, and performance effectiveness. Anderson (1983) utilized the same dependent variables and found that attribution manipulations completely override participants’ pre-existing attributional style while performing phone solicitations. The effect of attribution manipulation was comparable to the effect of participants’ original attributional style if left unaltered (for a review and pooled analysis of these studies, see Anderson et al., 1988).

The bulk of attribution retraining studies focus on academic achievement and social skills in children. Academically low-achieving students demonstrate SDB in which academic failure is attributed to poor skills and academic success is attributed to luck or the easiness of the task. Attribution retraining studies encourage students to attribute academic success to effort and academic failure to poor effort or strategy. The majority of these studies have been successful in increasing students’ persistence, positive expectations, and academic achievement (for a review, see William, 1997). Various methodologies have been utilized; for example, Okolo (1992) presented multiplication problems to learning disabled students on a computer. Upon completion of every 5 problems, feedback indicated students’ accuracy (e.g., “You now have 15 correct out of 15 tries.”). When control students were or were not meeting their goals they received neutral feedback (e.g., “You are meeting your goal” versus “You are not meeting your goal.”). However, there was also an attribution retraining condition, wherein students received information implying that skills (i.e., “You really know these”) and effort (i.e., “You are really trying hard”) were responsible for their successes. When students were not succeeding, the attribution retraining condition attributed their failures to effort (e.g., “You can get it if you keep
trying”). Thus, control participants were not told why they were or were not successful, whereas attribution retraining participants were told that their successes were due to abilities and efforts (i.e., internal causes) and that their failures were due to poor effort (i.e., internal, controllable cause). Students who were retrained completed more levels in the program and performed better than the control students on a posttest measure of skill attainment. In fact, control subjects did not perform better on posttest than at pretest; however, retrained subjects did improve after completing the computer task. Groups did not differ in their ratings of how well they liked the computer task or in their accuracy over all completed levels of the task; this indicates that group differences were not due to more favorable impressions of the feedback or receiving a greater ratio of successes to failures.

There are also a number of misattribution studies (for a review see Hope et al., 1989) where participants are led to attribute anxiety during a social performance to a noise or other external variable. These studies were generally effective, and misattributions were associated with reduced arousal and better performance. However, there are obvious difficulties in misattributions as treatment for more than a single social event.

Studies that have examined the effect of attribution retraining in social anxiety have suffered from confounds or other methodological problems and are not directly comparable to the current design (e.g., Forsyth and Forsyth, 1982; Ladd, 1981). In summary, attributional style is malleable.

**Current Study**

This study examined the effects of a Computerized Attribution Retraining Program, or CARP. The CARP was administered to socially anxious individuals before a behavioral challenge to examine its effects on state anxiety.
I aimed to modify attributions for successful and failing social situations by encouraging attribution of social success and failure to effort or the lack thereof, respectively. Thus, I did not merely emulate the SSB found in healthy populations. Teaching socially anxious individuals to attribute both social successes and failures to effort may increase their sense of control and thus decrease anxiety during a subsequent social performance. In fact, to my knowledge the closest socially anxious individuals have come within a study to attributing success to internal causes was when Alden (1987) found that socially anxious participants attributed improved performance to effort. Thus, it seems that effort may be a more appropriate attribution to encourage than other internal factors such as characteristics or ability, in the sense that success due to effort may be easier to accept for this population.

Indeed, research supports the link between anxiety and lack of perceived control over life events (Mineka & Kelly, 1989), and controllability is often viewed as the most important attribution dimension (Rees, Ingledew, & Hardy, 2005). In fact, cortisol release during an interaction task for internalizing children was associated with external attributions for both success and failure (Granger, Weisz, & Kauneckis, 1994), challenging the idea that external attributions for failure would help those with social anxiety (although see Sharma & Mohan, 2002, for an example of externalization of failure improving depressed students’ spelling performance). The attributions discouraged by the CARP were attributions for failure due to poor ability or characteristics and attributions for success due to external causes such as luck. In this way control was emphasized for all social situations, and the SDB was discouraged as well.
CHAPTER 2

METHOD

Social situations in the CARP were social successes and failures, ensuring that cost of failure is addressed along with the fear of positive evaluation common in social anxiety (Weeks, Rodebaugh, & Heimberg, 2005). These situations were comprised such that 42 social scenarios had an identical match, worded differently only in terms of success or failure outcome (e.g., “In conversation with a stranger the person appears interested” versus “In conversation with a stranger the person appears bored”). Participants next saw an attribution and responded (i.e., on the number pad press “1” for yes or “3” for no) based on whether they thought the attribution was “the best explanation” for the previous social situation. Each situation-attribution pair was considered one trial (see Figure 1); trials were presented in random order. Each of the situations was presented twice during the task, each time with a different attribution. Participants saw one attribution at a time such that endorsement of that attribution would more minimally affect later endorsement of the other attribution for that same social situation. Thus, there were 42 (social scenarios from differing domains) X 2 (positive versus negative outcome for the situation) X 2 (correct versus incorrect attribution) = 168 trials in my paradigm. Each participant saw 84 trials in their pre- and posttest set; participants saw the other 84 trials in their training or control condition.

For each situation, participants in the CARP condition received feedback indicating that one of the attributions was correct and one was incorrect. When participants endorsed a correct attribution or rejected an incorrect attribution, feedback consisted of the statement “You are
correct!” When participants endorsed an incorrect attribution or rejected a correct attribution, feedback consisted of the statement “Incorrect, please try again.” For positive situations, external (e.g., luck or the friendliness of the other people involved) explanations were incorrect while effort attributions were correct. For negative situations, internal-stable-uncontrollable (e.g., undesirable personal characteristics or poor ability) attributions were incorrect while effort attributions were correct. Also, as recommended by Heppner and Frazier (1992), I included attribution retraining to encourage controllable attributions for changes in social anxiety itself. For example, I included the situation “You notice that you are more shy than you used to be” and discouraged attributions such as “You don’t have social skills that other people possess,” while encouraging effort attributions such as “You haven’t been trying as hard to get out there and meet people.” See Table I for examples of situations and attributions in the CARP.

Power Computation

To my knowledge no computerized attribution manipulations have been conducted on socially anxious individuals. I examined the effect sizes yielded by the computerized attribution retraining given to learning disabled individuals, along with attribution retraining given to individuals performing complex social tasks. Thus, I examined both computerized training with a different dependent variable than the current study and non-computerized training involving social performance as a dependent variable. Anderson et al.’s (1983) attribution manipulations yielded a Cohen’s d of .75 on a composite index of future expectancies, strategy shifts, and performance effectiveness. Okolo’s computerized attribution retraining program yielded a Cohen’s d of .47; the dependent variable was skill attainment posttest performance adjusted for the pretest. This is quite similar to the way I measured anxiety after the behavioral assessment, controlling for anxiety upon start of the experiment. Thus, I utilized the more conservative effect
size estimate of .47. With alpha set to .05 and beta set at .80, I needed 50 participants per group for a total sample size of 100 participants (Cohen, 1988, p. 54).

Participants

One hundred and twenty-six undergraduates enrolled in an introductory psychology course were recruited through an experimetrix advertisement recruiting individuals with “performance anxiety.” Individuals received course credit for their participation. Data was analyzed from one hundred and two participants meeting criteria as described in the procedure. Three participants, however, declined to complete the speech task. These participants were omitted from analysis of anxiety levels, but they were included in analysis of attribution change.

Behavioral Assessment Task

Participants were instructed to give a five-minute speech that they were told would be video recorded and later evaluated for quality by a graduate student. Participants chose between 5 topics to discuss (i.e., abortion, corporal punishment, seatbelt laws, nuclear power, and the American Health System). They were allotted two minutes to prepare for and make notes for the speech. However, participants could not use these notes during their speech. Before the speech began the experimenter told the participant, “You may end this assessment at any time if you feel significant distress. To stop early, just hold up this STOP index card or simply say stop. Now, please be sure to look directly into the camera and try to speak for the full five minutes. I will let you know when the time is up” (adapted from Hofmann, Gerlach, Wender, & Roth, 1997 and Beidel, Turner, Jacob, & Cooley, 1989).

Self Report Measures

1.) Beck Depression Inventory-II (BDI-II; Beck & Steer, 1987). Twenty-one items measure cognitive (e.g., thoughts of worthlessness) and physiological (e.g., changes in appetite)
symptoms of depression. The BDI is widely used, reliable ($r$ ranges from .48 to .86), and internally consistent ($\alpha = .86$) (Beck, Steer, & Garbin, 1988).

2.) State-Trait Anxiety Inventory (STAI; Spielberger, 1983). The STAI consists of two forms, one measuring state anxiety and the other measuring trait anxiety. These two forms have demonstrated adequate psychometric characteristics (Spielberger, 1983).

3.) Liebowitz Social Anxiety Scale Self-Report (LSAS-SR; adapted from the interview version by Liebowitz, 1987). The LSAS-SR has demonstrated strong internal consistency and convergent and discriminant validity; it performs very similarly to the LSAS interview version (Fresco et al., 2001). The LSAS-SR also demonstrates test-retest reliability and is responsive to treatment change (Baker, Heinrichs, Kim, & Hofmann, 2002). It consists of 24 social situations to which participants must give ratings of how fearful they would be in the situation as well as how likely they are to avoid the situation.

4.) Attributional Style Questionnaire for Social Events (ASQSE; Taylor et al., 1997). The ASQSE consists of positive and negative interpersonal situations (e.g., “You give an important talk in front of a group and the audience reacts negatively”, “You do a project which is highly praised”) selected from the Attributional Style Questionnaire (ASQ; Peterson et al., 1982). Participants must generate and write down a “major cause” for each situation, rate the importance of the situation to them, and rate on 1-7 Likert scales how internal, stable, and global they think their cause is. The ASQSE was included as a pre and post measure to test the hypothesis that change in attribution style will generalize to other assessment formats.

5.) Self-Statements During Public Speaking (SSPS; Hofmann & DiBartolo, 2000). Ten positive and negative self-statements statements (e.g., “What I say will probably sound stupid”) related to impromptu speeches comprise the SSPS; responses are on 5 point dimensional scales. The SSPS
has high internal consistency for its positive statement scale (normal sample: $\alpha = .75$, socially phobic sample: $\alpha = .80$) and negative statement scale (normal sample: $\alpha = .86$, socially phobic sample: $\alpha = .86$); it also demonstrates 3 month test-retest reliability for its positive scale (socially phobic sample: $r = .78$) and negative scale (socially phobic sample: $r = .80$). The negative self-statement scale is sensitive to treatment; both scales correlate moderately with various measures of social anxiety (Hofmann & DiBartolo, 2000).

6.) Personal Report of Confidence as a Speaker Questionnaire (PRCS; Gilkinson, 1942, shortened by Paul, 1966). The PRCS consists of 30 statements (e.g., “I look forward to an opportunity to speak in public”) and participants must endorse true or false relative to their most recent speech. The PRCS is common in treatment-outcome studies and other studies involving public speaking (Phillips, Jones, Rieger, & Snell, 1997). It is internally consistent ($\alpha = .91$) and demonstrates convergent validity ($r$ ranges from .52 to .97) with other speech and social anxiety questionnaires (Daly, 1978).

**Design**

The design of hypothesis 1 was a set of 2 Group (Training, Placebo) analyses of covariances (ANCOVAs). In the first ANCOVA set, the dependent variable was percentage endorsement of each attribution type on the post-training computerized assessment, controlling for endorsement of that type at pre-training. I predicted that in the training condition, effort attributions would increase while self-deprecating attributions would decrease. In the second set of ANCOVAs, the dependent variable was rating of each attribution dimension on the ASQSE, controlling for rating of that dimension at pre-training. I hypothesized that for negative social situations, training would result in less stable, global, and important ratings of attributions, while
for positive social situations, training would result in more internal and important ratings of attributions.

The design of the hypothesis 2 was two 2 Group (Training, Placebo) ANCOVAs with post-training anxiety level as the dependent variable, controlling for anxiety level at pre. Anxiety was measured via the STAI-state version and a 1-10 anxiety rating scale. I hypothesized that individuals in the training condition would report less anxiety compared to baseline than participants in the placebo group.

Procedure

Participants were omitted from analysis if they scored less than or equal to a 25 on the LSAS, such that all participants in the analysis suffered from some degree of social anxiety. This eliminated 19% of the participants. Half the participants were randomly assigned to the CARP condition, and the other half were assigned to a control condition in which no feedback was given. Participants and experimenters were blind to condition, as the participants were given a condition number in an envelope. When participants entered this number into the computer program, the appropriate condition began. Participants did not know the condition type that corresponded to their number. Experimenters did not see the number and waited outside the experiment room while participants completed the computer task. The computer program showed participants instructions for the task. These instructions were slightly different depending on condition, as for the CARP condition participants were instructed to expect feedback.

First participants completed a demographics sheet, STAI-State and Trait versions, BDI-II, LSAS-SR, ASQSE, computerized attribution pre-test, and a rating of current anxiety, sadness, and shame levels (1-10). Next, participants were told that they will give a video behavioral
assessment; they then completed the second STAI-state and the second anxiety, sadness, and shame rating scale set. Sadness and shame rating scales were included to ensure that the CARP did not have adverse effects on other emotions. Then participants completed either the CARP or the control task. After the computer task, the participants completed the ASQSE, computerized attribution post-test, the third STAI-state and the third anxiety, sadness, and shame rating scale set. Next, participants completed the behavioral assessment task. Finally, participants completed the fourth STAI-state measure and anxiety, sadness, and shame rating scale set, the SSPS, and the PRCS.
CHAPTER 3

RESULTS

T-tests were performed on demographic and baseline variables to determine equivalence of groups (see Table 2). Groups differed significantly (p < .05) on age t(100) = 2.35, but were not significantly different in education level, BDI-II, STAI-state, STAI-trait, LSAS, anxiety rating, sadness rating, or shame rating (p > .05).

Hypothesis 1

Statistically significant (p < .01) main effects of group on attribution endorsement rates for all attribution types were found in the expected direction on the computerized assessment measure, controlling for endorsement rate of each attribution type at pre (see Figure 2). These attribution types were internal, stable attributions for negative situations F(1, 99) = 37.12, effort attributions for negative situations F(1, 99) = 27.86, external attributions for positive situations F(1, 99) = 27.44, and effort attributions for positive situations F(1, 99) = 7.46.

A set of 2 Group ANCOVAs was performed on attribution rating scales of the ASQSE post-training, controlling for ratings on these same scales pre-training. A similar pattern of results was obtained regardless of whether all situations were used, as in the ASQ, or whether only social situations were used, as in the ASQSE. Thus, results are reported for the ASQ. Main effect of group was significant for globality ratings of attributions for negative situations F(1, 99) = 5.36, p < .05, globality ratings of attributions for positive situations F(1, 99) = 7.80, p < .01, and importance ratings of attributions for negative situations F(1, 99) = 4.19, p < .05. Inspection of Figures 3 and 4 reveal that the training was associated with increased globality ratings for both
positive and negative situations and increased importance ratings for negative situations. Main
effect of group was non-significant for stability ratings for attributions of negative situations F(1, 99) = 0.62, p = .43, stability ratings for attributions of positive situations F(1, 99) = 1.86, p = .18,
internality ratings for attributions of negative situations F(1, 99) = 0.09, p = .77, internality
ratings for attributions of positive situations F(1, 99) = 0.53, p = .47, and importance ratings for
positive situations F(1, 99) = 1.55, p = .22.

Hypothesis 2

A 2 Group ANCOVA was performed on STAI-state scores post-training, controlling for
STAI-state scores at baseline (see Table 3). Main effect of group was non-significant F(1, 96) =
0.01, p = .93. Next, a 2 Group ANCOVA was performed on anxiety ratings post-training,
controlling for baseline anxiety ratings. Main effect of group was non-significant F(1, 96) =
0.75, p = .39. Group also failed to exert a main effect on sadness or shame ratings at post-
training, controlling for baseline ratings of these emotions (p > .75).

To assess whether training modified public speaking cognitions, the means of each group
on the PRCS and positive and negative scales of the SSPS were compared using a t-test. No
differences were found between the groups on these measures (p > .10). To assess whether
persistence on the public speaking task was affected by the training, the mean number of seconds
that each group spent on the speech were compared using a t-test. The training group persisted
for significantly less time (M = 112 s, SD = 76 s) on the speech task than the control group (M =
149 s, SD = 84 s), t(97) = 2.31, p < .05.
CHAPTER 4
DISCUSSION

Results suggest that attributions are malleable via a single-session, computerized intervention. All attributions targeted by the intervention were significantly modified in the expected direction when measured by the computerized assessment task. The intervention also modified ratings of self-generated attributions on the ASQ, a paper-and-pencil measure of perceived importance of events and perceived attribution globality, internality, and stability. However, attribution changes on the ASQ were not always in the expected direction. For negative social situations, the training decreased internal, stable attributions (e.g., ability) and increased effort attributions as measured by the computerized assessment. Thus, ASQ ratings of globality, stability, and importance were expected to decrease for negative situations, as lack of effort was thought to be a less pernicious and stable attribution than lack of ability. However, stability ratings for negative events did not change as a function of group, while globality and importance ratings for negative events increased.

It is possible that when our participants endorsed attributions emphasizing lack of effort, character or ability attributions were also inferred. For example, laziness or callousness may have been perceived as a distal attribution while endorsing lack of effort as the more proximal attribution. Thus, though the program decreased explicit endorsement of internal, stable attributions, implicit endorsement of these attributions may have remained. These attributions for failure may have even increased; effort attributions for failure may have increased at the expense of external attributions for failure, which as explained previously were not involved in
the computer program. This may explain the increased globality and importance ratings for negative situations. However, the nature of effort attributions themselves may help to explain the pattern of results on the ASQ. Effort may have been construed by the participants as a more globally-applied behavioral strategy, with important ramifications.

It is more difficult to explain the pattern of results for social successes. Since external attributions for success were decreased and effort attributions were increased, internality ratings on the ASQ were also expected to increase. Instead, only globality ratings for positive social situations increased in response to the training. This calls into question the generalizability of our forced-choice computerized format to a format in which individuals self-generate and then rate an attribution. However, the fact that our intervention impacted attribution style across formats—although not on the expected dimension—implies that a single-session computerized intervention can change attribution style can change in meaningful ways.

The changes in attributional style effected by our computerized intervention were not, however, accompanied by reduced self-reported anxiety during a subsequent speech task. Perhaps, as discussed previously, effort attributions were not helpful because when applied to negative situations they implied negative personal characteristics. However, there are two reasons this explanation may be inadequate. First, the aforementioned educational research suggests effort attributions for failure are beneficial. Second, in an unpublished pilot study I tested a computerized intervention that encouraged external attributions for failure (i.e., the self-serving bias for negative situations), and I found a similar lack of anxiety reduction on the stress task.

A better explanation may be due to the nature of the stress task. During the speech, the experimenter maintained a neutral facial expression and refrained from reacting to the
participants’ speeches. The attribution training, however, focuses on relatively clear cases of social success and failure. Thus, the training may prepare participants to more effectively cope with success and failure, but not more ambiguous social situations. Perhaps the attribution training would have reduced self-reported anxiety if bogus success or failure feedback was provided regarding participants’ performance. Additionally, persistence on the current stress task was actually decreased in the training group as opposed to the placebo group. This may have been due to incompatibility between the lack of experimenter feedback and the situations for which effort attributions were encouraged.

Attribution retraining may also require additional training sessions or a longer incubation period prior to exerting an effect on reported social anxiety. It may be that individuals must respond based on their attribution (i.e., apply more effort after a social failure) and observe positive consequences of doing so prior to increased belief in the attribution and reduction of social anxiety in subsequent, similar situations.

Limitations of this study include use of an analogue sample. Thus, the participants may not have been sufficiently socially anxious to benefit from the attribution training. To address this concern, I ran the analyses for hypothesis 2 using a higher LSAS cutoff (i.e., 50) to target the more socially anxious participants. This produced a similar pattern of results. However, higher symptomatic cutoffs cannot substitute for a careful diagnostic interview in establishing a clinical sample. Results may not generalize to individuals with GSP.

Further, my sample was limited to undergraduates enrolled in an introductory psychology course. Also, random assignment to groups also did not result in statistically equivalent groups in terms of age. However, the difference in age is unlikely to be clinically significant, as groups
matched on the other baseline psychometric variables. Also, when age was included as a covariate in all the previous analyses, the pattern of results remained the same.

In summary, results indicate that attributional style may be modified by a single-session computerized intervention. However, the intervention failed to reduce self-reported anxiety on a subsequent speech task for which the participants did not receive feedback. Future studies should utilize clinical samples, incorporate feedback into the stress task such that there is a closer match between the nature of the stressor and the nature of the situations described in the training program, and attempt attribution retraining over a longer time period.
REFERENCES


Table 1.

Example Materials

<table>
<thead>
<tr>
<th>Positive Situations</th>
<th>Correct Response</th>
<th>Incorrect Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>During a date while eating dinner your date nods with interest</td>
<td>You’re trying to tell stories that match your date’s interests</td>
<td>They’re trying to be nice</td>
</tr>
<tr>
<td>While at a party you realize you are not nervous at all</td>
<td>You made an effort to contribute to conversations</td>
<td>Most of the people are familiar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Negative Situations</th>
<th>Correct Response</th>
<th>Incorrect Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>You ask someone to dance but they say no</td>
<td>You didn’t try to put much enthusiasm into your request</td>
<td>You look gawky</td>
</tr>
<tr>
<td>Everyone is watching you give a speech and they don’t clap</td>
<td>You didn’t spend much time preparing</td>
<td>You’re a poor public speaker</td>
</tr>
</tbody>
</table>
Table 2.

Demographic and Baseline Measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>Training</th>
<th>Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Female</td>
<td>69.2</td>
<td>72.0</td>
</tr>
<tr>
<td>Age</td>
<td>18.8 (1.10)*</td>
<td>19.5 (1.72)*</td>
</tr>
<tr>
<td>Education</td>
<td>12.8 (4.51)</td>
<td>13.7 (3.63)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>10.5 (7.72)</td>
<td>13.4 (8.89)</td>
</tr>
<tr>
<td>STAI-S</td>
<td>36.1 (9.88)</td>
<td>36.5 (10.66)</td>
</tr>
<tr>
<td>STAI-T</td>
<td>39.0 (10.74)</td>
<td>43.4 (11.95)</td>
</tr>
<tr>
<td>LSAS</td>
<td>55.4 (17.92)</td>
<td>56.8 (19.34)</td>
</tr>
<tr>
<td>Anxiety Rating</td>
<td>4.1 (2.04)</td>
<td>3.7 (1.73)</td>
</tr>
<tr>
<td>Sadness Rating</td>
<td>2.4 (1.52)</td>
<td>2.6 (1.71)</td>
</tr>
<tr>
<td>Shame Rating</td>
<td>1.8 (1.42)</td>
<td>2.2 (1.78)</td>
</tr>
</tbody>
</table>

Note. BDI-II = Beck Depression Inventory-II, STAI-S = Spielberger State-Trait Anxiety Inventory-State Form, STAI-T = Spielberger State-Trait Anxiety Inventory-Trait Form, LSAS = Liebowitz Social Anxiety Scale. *p < .05.
Table 3.

Post-Speech Measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Training</td>
<td>Placebo</td>
</tr>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>STAI-S</td>
<td>46.1 (13.66)</td>
<td>46.2 (12.12)</td>
</tr>
<tr>
<td>Anxiety Rating</td>
<td>5.5 (2.74)</td>
<td>5.7 (2.59)</td>
</tr>
<tr>
<td>Sadness Rating</td>
<td>2.0 (1.77)</td>
<td>2.3 (1.77)</td>
</tr>
<tr>
<td>Shame Rating</td>
<td>2.3 (2.03)</td>
<td>2.5 (2.16)</td>
</tr>
<tr>
<td>SSPS-Positive Subscale</td>
<td>16.3 (5.44)</td>
<td>15.6 (4.55)</td>
</tr>
<tr>
<td>SSPS-Negative Subscale</td>
<td>8.98 (6.05)</td>
<td>10.8 (5.71)</td>
</tr>
<tr>
<td>PRCS</td>
<td>31.3 (5.75)</td>
<td>32.2 (5.00)</td>
</tr>
</tbody>
</table>

Note. STAI-S = Spielberger State-Trait Anxiety Inventory-State Form, SSPS = Self-Statements During Public Speaking, PRCS = Personal Report of Confidence as a Speaker Questionnaire. *p < .05.
Figure Captions

*Figure 1.* Example Trial.

*Figure 2.* Percent Endorsement of Attributions on the Computerized Assessment for Social Events by the Training and Placebo Groups, Post-Training

*Figure 3.* Ratings of Attributions for Negative Events on the ASQ by the Training and Placebo Groups, Post-Training

*Figure 4.* Ratings of Attributions for Positive Events on the ASQ by the Training and Placebo Groups, Post-Training
Figure 1.

500 ms

Someone you don’t know asks you to dance

( Participant presses space bar )

You’ve been working on your dance skills
Is this the best explanation for the social situation?

( Participant presses #1 for ‘Yes’)  

You are correct!
Figure 2.
Figure 3.
Figure 4.