

Post-Event Rumination and Negative Self-Appraisal in Social Phobia Before and After Treatment

Maree J. Abbott and Ronald M. Rapee
Macquarie University

This study investigated the relationship between self-appraisals of performance, symptom severity and post-event rumination in social phobia, and evaluated the effect of treatment on these variables. A socially phobic group and a nonanxious control group performed an impromptu speech and were told that their performance would be evaluated. Participants appraised their performance immediately after the speech and 1 week later, and the frequency of post-event rumination during the week following the speech was assessed. The socially phobic group maintained the negative appraisals of their speech over the week, whereas the nonclinical group showed increased positivity about their performance. The socially phobic group also engaged in more negative rumination than controls. Treatment improved perceptions of performance and reduced negative rumination. These results are discussed in the light of cognitive models of social phobia.

The role of post-event rumination in the maintenance of social phobia has recently been the focus of theoretical and empirical attention (Abbott & Rapee, 2003; Clark & Wells, 1995; Mellings & Alden, 2000; Rapee & Heimberg, 1997). In relation to social phobia, post-event rumination refers to the tendency for socially phobic individuals to engage in negative rumination following a social or performance event, such as a speech or social interaction (Clark & Wells, 1995). Clark and Wells's cognitive model of social phobia includes post-event rumination as one of four primary processes involved in the maintenance of social anxiety, along with self-focused attention, in-situation safety behaviors and assumptions, and self-schemata. According to the Clark and Wells model, socially phobic individuals engage in a "post-mortem" of social events that features both anxious feelings and negative cognitions relating to their self-perception. Clark and Wells argue that the cognitive content and associated affect of post-event rumination for socially phobic individuals is guided by the thoughts and feelings that were processed during the social or performance event itself. In other words, if socially phobic individuals believe that others perceive them as stupid and incompetent during a speech task, then the content of ruminations following their speech may include thoughts indicative of the belief that they have been evaluated negatively, such as "I looked stupid" and "Everyone thinks I am a failure." In addition, Clark and Wells also suggest that the process of post-event rumination may prompt past recollections of perceived social failures. These recollections may also play a role in maintaining and reinforcing the negative affect and cognitions associated with social phobia. The processing of performance events in this way may also result in the perception of one's performance worsening over time. Clark and Wells cite a disturbing case study reported by Heimberg (1991, cited in Clark

& Wells, 1995) in which a socially phobic client was role-playing a hostess at a party. In the example, she spilled a drink and coped well with the initial anxiety, but later attempted suicide after dwelling on her performance. This graphic and sad example highlights the possibility that socially phobic individuals may perceive their performance in social situations more poorly over time.

Relatively few empirical studies have investigated post-event rumination in social phobia. Rachman, Gruter-Andrew, and Shaf-ran (2000) investigated the prevalence and characteristics of post-event rumination with groups of high and low socially anxious individuals. Rachman et al. found that socially anxious individuals commonly engage in post-event rumination after an anxiety-provoking or embarrassing social event. This rumination is recurrent and intrusive, and interferes with the individual's concentration, presumably by capturing and maintaining the focus of attention. Laboratory research with nonclinical samples has also shown that socially anxious individuals engage in significantly more negative rumination about their performance the day following a social interaction and following a speech task compared with individuals low in social anxiety (Edwards, Rapee, & Franklin, 2003; Mellings & Alden, 2000). In a nonclinical sample, Abbott and Rapee (2003) found that the best predictors of levels of rumination following a social event were the degree of state anxiety experienced during the situation and levels of trait anxiety. It is also conceivable that individuals with high levels of social anxiety differ from those low in social anxiety in the amount of both positive and negative rumination that they engage in after a performance event. Previous research has shown that more than 50% of individuals in the nonclinical population experience persistent and repetitive thoughts that are positively valenced (e.g., Edwards & Dickerson, 1987). It is possible, therefore, that individuals low in social anxiety also ruminate after a performance task, but that their rumination may center on the perceived positive, rather than negative, aspects of their performance.

Clark and Wells's (1995) model predicts a specific relationship between appraisal of one's performance in social situations as negative and the ensuing tendency to engage in negative post-

Maree J. Abbott and Ronald M. Rapee, Department of Psychology, Marquarie University, Sydney, Australia.

Correspondence concerning this article should be addressed to Maree Abbott, Department of Psychology, Macquarie University, Sydney NSW 2109, Australia. E-mail: mabbott@psy.mq.edu.au

event rumination for socially phobic individuals. According to this model, there should be a correlation between negative perceptions of performance and the frequency of negative rumination. That is, the more negatively one perceives their performance, the greater the frequency of negative post-event rumination. A number of studies have shown that socially anxious individuals appraise their performance more negatively than ratings made by independent observers and that this discrepancy between self- and observer ratings is greater in socially anxious individuals than in individuals low in social anxiety (Alden & Wallace, 1995; Mellings & Alden, 2000; Rapee & Hayman, 1996; Rapee & Lim, 1992; Stopa & Clark, 1993). However, studies to date have not specifically investigated the relationship between these subjective appraisals of performance and post-event rumination for socially anxious individuals.

A complicating factor in research into social phobia is the high concordance found between cognitive factors associated with social anxiety and depression (Alden, Bieling, & Meleshko, 1995; Anderson & Arnoult, 1985; Bruch, Mattia, Heimberg, & Holt, 1993; Ingram, 1990). This is consistent with relatively high rates of comorbidity between social phobia and depression (e.g., Lepine & Lellouch, 1995; Merikangas & Angst, 1995). The tendency to ruminate is also a common feature of depression and has been implicated in the maintenance and development of depressive episodes (e.g., Nolen-Hoeksema, 1987; Wenzlaff, Wegner, & Roper, 1988). Indeed, the tendency to ruminate about depressive symptoms has been shown to predict the onset of depressive episodes 1 year later (Nolen-Hoeksema, 2000). However, research has yet to investigate the specificity of the relationship between social anxiety and post-event rumination by assessing the independent contributions of self-reported social anxiety and depression in the prediction of negative post-event rumination. Rachman et al. (2000) showed that social anxiety was significantly correlated with post-event rumination when controlling for levels of depression, but did not assess whether depression was uniquely associated with rumination following a social event. Any relationship between depression and negative post-event rumination for socially phobic individuals may be mediated by beliefs that they have been negatively evaluated and the tendency to appraise their performance in social situations negatively.

A large number of studies have now shown that cognitive-behavioral treatments for social phobia significantly reduce symptoms of social anxiety (e.g., Chambless & Gillis, 1993; Gould, Buckminster, Pollack, Otto, & Yap, 1997; Heimberg et al., 1990; Heimberg & Juster, 1994). There is also growing evidence from laboratory studies that cognitive interventions using video feedback can improve self-perceptions of performance for socially phobic individuals (e.g., Harvey, Clark, Ehlers, & Rapee, 2000; Rapee & Hayman, 1996). A small number of studies have also attempted to assess whether socially phobic individuals appraise the quality of their performance during anxiety-provoking tasks more positively following treatment; these studies have shown improvements in perceptions of performance following treatment, but have only used single-item measures (Heimberg et al., 1990; 1998). Thus, replication using a standard self-appraisal of performance measure is required to assess whether treatments for social phobia change self-perceptions of performance. Furthermore, researchers have yet to evaluate whether cognitive-behavioral treatments for social phobia have any effect on reducing the frequency

of negative rumination for socially phobic individuals. It is important to evaluate whether current treatments have any effect on these factors, given their proposed theoretical importance in the maintenance of social anxiety.

The present study aimed to further investigate the phenomena of post-event rumination and self-appraisals of performance in social phobia and to test several hypotheses derived from the Clark and Wells (1995) model. Groups of socially phobic individuals and nonanxious controls were asked to rate their performance immediately after a speech task, and then again 1 week later. They also completed a post-event rumination questionnaire 1 week following their speech task. This questionnaire was developed to measure the frequency with which participants engaged in both positive and negative rumination during the week following their speech task. The motivation for obtaining perception of performance ratings immediately after the speech task and again 1 week later was to test the hypothesis that socially phobic individuals rate their performance progressively more negatively over time. It is conceivable that self-appraisals of performance may worsen for people with social phobia as a result of negative post-event rumination and any accompanying recall of past-perceived social failures. The present study also aimed to investigate whether cognitive-behavioral treatment for social phobia has the effect of reducing the frequency of post-event rumination and improving self-perceptions of performance. Therefore, a subgroup of individuals in the socially phobic group repeated the study after they had completed a cognitive-behavioral treatment program for social phobia.

Consistent with previous research, it was hypothesized that all participants would rate their speech performance more poorly than the independent observer would, but that this discrepancy would be greater for the socially phobic group (e.g., Rapee & Lim, 1992). It was also hypothesized that the socially phobic group would engage in more negative rumination about their speech task than the control group would (e.g., Mellings & Alden, 2000). In accordance with the Clark and Wells (1995) model, it was hypothesized that there would be a significant correlation between negative perceptions of speech task performance and the frequency of negative post-event rumination about the speech. The effect of cognitive-behavioral treatment for social phobia was also expected to improve perceptions of performance and reduce the frequency of negative post-event rumination. The present study also allowed for further exploration of any relationships between negative self-perceptions of performance, subjective ratings of social anxiety and depression, and the tendency to engage in negative post-event rumination.

Method

Participants

Two groups of participants were recruited to the study. The clinical group consisted of 33 male and 21 female participants who met *Diagnostic and Statistical Manual of Mental Disorders* criteria for a principal diagnosis of social phobia (*DSM-IV*; American Psychiatric Association, 1994). All of the participants in the clinical group were seeking treatment from the Social Phobia Clinic at Macquarie University. There were 12 men and 20 women in the control group. Participants in the control group consisted of both undergraduate psychology students from Macquarie University who received course credit for their participation and community volunteers

recruited from advertisements in local businesses, who were paid a small sum as reimbursement for their time and travel expenses. None of the control group had ever sought help from a mental health professional. Data for 11 participants in the clinical group and 2 control participants were excluded from the analyses because they failed to return their post-event rumination questionnaires. Therefore, the analyses include 43 people with social phobia and 30 control participants. The 11 socially phobic participants who failed to return their post-event rumination questionnaires did not differ significantly from those who completed the measures on social anxiety scores, depression scores, subjective ratings of performance (all $t_s < 0.9$, ns), or on demographic variables such as income, employment, education, or marital status (all chi-square analyses nonsignificant). All participants were assessed by graduate students in clinical psychology using the *Anxiety Disorders Interview Schedule for DSM-IV* (ADIS-IV; DiNardo, Brown, & Barlow, 1994). Clinical psychologists experienced in the assessment and treatment of adult anxiety disorders trained the graduate students in the structured interview. In order to assess for diagnostic reliability, the assessment interviews were videotaped and coded by an independent rater who was blind to the diagnostic status of participants. Interrater reliability for a principal diagnosis of social phobia using the ADIS-IV was calculated for our clinic using kappa coefficients, and showed excellent agreement ($\kappa = .89$). Participants in the present study, including both clinical and control participants, constituted 25.3% of this sample. Avoidant personality disorder was diagnosed using the *ICD-10 International Personality Disorder Examination* (Loranger, Janca, & Sartorius, 1997). Interrater reliability was also calculated for avoidant personality disorder diagnoses for our clinic using kappa coefficients, and showed substantial agreement ($\kappa = .65$) (Abbott, Peters, & Rapee, 2003). The mean clinical severity rating for the principal diagnosis of social phobia was 6.1 ($SD = 1.0$), on an 8-point scale where a higher score indicates greater severity. Nearly two thirds (65.1%) of the social phobia group also met the diagnostic criteria for avoidant personality disorder (mean clinical severity rating = 5.0, $SD = 1.5$). Additional Axis I diagnoses for participants in the socially phobic group included generalized anxiety disorder (34.9%), other anxiety disorders (20.9%), dysthymia (14.0%), major depressive disorder (11.6%), and alcohol abuse/dependence (9.3%). None of the control group met the diagnostic criteria for social phobia; however, 4 control participants were diagnosed with a specific phobia and 1 with substance abuse; the data for these participants were included in the analyses.

Twenty-three individuals in the socially phobic group participated in the study again after they had completed the treatment program; the two research sessions were approximately 12 weeks apart. Complete sets of posttreatment data were received for 20 people with social phobia, and the posttreatment analyses are based on this data set. The remaining participants in the socially phobic group did not complete the task after treatment for a variety of reasons; for example, they had not completed the pretreatment measures, they had discontinued treatment or they declined to participate; a small number had also been waitlisted for treatment. A t test showed that the mean pretreatment clinician severity rating for the diagnosis of social phobia did not differ significantly for those individuals who repeated the study following treatment compared with those who did not, $t(51) = 0.94$, $p > .05$. The mean age of those who repeated the study following treatment did not differ significantly compared with those who did not, $t(52) = 0.35$, $p > .05$, and a chi-square analysis showed that the proportion of men and women did not differ significantly for those who repeated the study compared with those who did not, $\chi^2(1, N = 54) = 0.02$, $p > .05$.

A chi-square test revealed that the proportion of men in the clinical group (65.1%) was significantly greater than that in the control group (36.7%), $\chi^2(1, N = 73) = 5.7$, $p < .02$. The mean age of the clinical and control groups was 35.6 years ($SD = 10.1$) and 36.4 years ($SD = 11.3$), respectively; the difference in the mean ages of the two groups was not significant, $t(71) = 0.35$, $p > .05$. There were also no significant differ-

ences between the clinical and control groups in terms of income, $\chi^2(7, N = 73) = 6.20$, $p > .05$, educational status, $\chi^2(4, N = 73) = 5.2$, $p > .05$, employment type, $\chi^2(3, N = 72) = 2.9$, $p > .05$ or marital status, $\chi^2(4, N = 73) = .57$, $p > .05$.

Measures

Questionnaire measures of anxious and depressive symptomatology were administered to all participants. Measures of social anxiety included the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998), the Social Phobia Scale (SPS; Mattick & Clarke, 1998), the Fear of Negative Evaluation Scale, Short Version (BFNE; Leary, 1983) and the Albany Panic and Phobia Questionnaire–Social Anxiety Scale (APPQ; Rapee, Craske, & Barlow, 1994). The short form (21-item) of the Depression Anxiety and Stress Scales (Lovibond & Lovibond, 1995) was administered as a measure of trait anxiety, depression, and stress.

Rapee and Lim's (1992) Performance Questionnaire was used as a subjective measure of public speaking performance. The Performance Questionnaire asks participants to appraise their performance with regard to various aspects of their speech, on a 5-point rating scale. This measure includes 12 specific performance items (e.g., kept eye contact with audience, stuttered) and 5 global performance items (e.g., appeared nervous, made a good impression). The total Performance Questionnaire score ranges from 0 to 68; a higher score indicates a more positive view of one's performance. Previous studies have shown that the Performance Questionnaire has good internal consistency and good interrater reliability among two or more observer raters (Rapee & Hayman, 1996; Rodebaugh & Chambless, 2002).

A post-event rumination questionnaire, modified from Edwards et al. (2003), was used to measure the tendency for participants to engage in post-event rumination following their speech task. This measure asks participants how frequently they thought about various aspects of their speech during the week following their speech task, on a 5-point scale ranging from *never* (0) to *very often* (4). The post-event rumination questionnaire comprises two scales including 9 positive rumination items (e.g., I looked confident; My speech was good) and 14 negative rumination items (e.g., I looked stupid, I felt like a failure). The positive rumination scale score ranges from 0 to 36, and the negative rumination scale score ranges from 0 to 56; higher scores indicate more frequent rumination. Alpha coefficients were calculated to assess the internal consistency of the positive and negative rumination scales; both scales showed excellent internal consistency, $\alpha = .95$ and $.94$, respectively. The total scores for each scale are not directly comparable, as they are composed of differing numbers of items. It is noteworthy that the use of this scale in the present research is indicative of levels of rumination with respect to a specific social/performance task and not levels rumination about a range of issues more generally.

Materials

Speech tasks were recorded using either a VHS or digital video camera.

Procedure

Participants completed the battery of symptom measures prior to their assessment session. Following the diagnostic assessment, participants were asked to give a 3-min impromptu speech on any topic of their choice, but were asked not to talk about anxiety or their participation in the research study. Participants were told that an independent judge would rate their performance from the videotape of their speech. The experimenter remained in the room throughout the task and told participants when 3 min had elapsed. Participants were asked to focus on the camera throughout the task and not on the experimenter. The experimenter did not give any feedback to participants about their speech performance. Immediately after the speech task, participants completed the Performance Questionnaire

(Rapee & Lim, 1992). Participants were then given a sealed envelope and told that a researcher would contact them by phone in 1 week as a reminder to complete the enclosed questionnaires at that time. The envelope contained the post-event rumination questionnaire and an equivalent version of the Performance Questionnaire, modified to ask participants how they felt they actually performed during their speech 1 week ago, as well as a postage paid envelope. Individuals in the socially phobic group participated in a 12-week cognitive-behavioral program for social phobia based on Rapee and Sanderson (1998), as part of an ongoing treatment-outcome study. The components of this program include realistic thinking, attention training, graded exposure, performance training and feedback, and assertiveness and perfectionism are addressed on a needs basis. The speech task procedure was identical for those in the socially phobic group who repeated the study following treatment.

Results

Symptom Measures

Table 1 reports the mean symptom measure scores and standard deviations for the two groups. Comparisons of these measures were made for the two groups using *t*-tests, and the experiment-wise error rate was controlled at $\alpha = .05$, using a Bonferroni correction to avoid inflation of the Type I error rate.

As can be seen in Table 1, the socially phobic group had significantly higher scores on each of the symptom measures relative to the control group. The mean scores on the social anxiety measures for the socially phobic group were in the clinical range and are consistent with other research with this population (e.g., Mattick & Clarke, 1998).

Appraisals of Speech Task Performance and Post-Event Rumination

Table 2 reports the means and standard deviations on the Performance Questionnaire (Time 1: completed immediately after the speech task; Time 2: completed 1 week after the speech task) and

Table 1
Mean Symptom Measure Scores and Standard Deviations for the Social Phobia and Control Groups

Measure	Socially phobic group		Control group		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
SIAS	53.0	14.8	14.6	8.7	12.7**
SPS	35.3	16.4	6.2	4.5	9.4**
BFNE	51.0	7.4	27.9	8.2	12.4**
APPQ-SP	38.4	14.5	7.7	4.7	11.2**
DASS-Depression	18.7	11.0	6.9	7.0	5.1**
DASS-Anxiety	15.8	6.2	5.3	5.9	7.2**
DASS-Stress	21.2	8.1	12.8	7.8	4.4**

Note. SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; BFNE = Fear of Negative Evaluation Scale, short version; APPQ-SP = Albany Panic and Phobia Questionnaire—Social Anxiety subscale; DASS-Depression = Depression Anxiety Stress Scales—Depression subscale; DASS-Anxiety = Depression Anxiety Stress Scales—Anxiety subscale; DASS-Stress = Depression Anxiety Stress Scales—Stress subscale. ** $p < .01$.

Table 2
Mean Performance Questionnaire and Post-event Rumination Questionnaire Scores and Standard Deviations (in Parentheses) for the Two Groups

Group	PQ Time 1	PQ Time 2	Negative PER	Positive PER
Control (<i>n</i> = 30)	46.5 (9.4)	50.0 (7.8)	4.3 (4.3)	9.4 (9.0)
Pretreatment				
Socially phobic Full sample (<i>N</i> = 43)	37.3 (11.3)	38.7 (10.2)	17.4 (10.8)	8.2 (7.0)
Treated subgroup (<i>n</i> = 20)	40.0 (10.8)	40.3 (10.0)	16.5 (10.2)	8.8 (7.2)
Posttreatment				
Socially phobic	47.3 (9.5)	48.4 (8.5)	11.1 (9.0)	10.8 (7.2)

Note. PQ = Performance Questionnaire total; PER = post-event rumination.

the post-event rumination questionnaire for the socially phobic and control groups.

A single independent rater scored each of the videotaped speech tasks using the Performance Questionnaire in order to obtain a more objective, observer index of the speech performances. The order of speech tasks presented to the independent rater was randomized so that they were unaware of whether the speech was being performed by a person with social phobia or a control participant, whether it was recorded at pretreatment, posttreatment, or whether some participants had completed two speeches over a 12-week period without any intermediate treatment. An alpha coefficient was calculated to assess the internal consistency of the independent observer's ratings of performance, showing excellent internal consistency, $\alpha = .84$. The mean (*SD*) Performance Questionnaire score by the rater was 52.6 (6.5) and 55.2 (5.3) for the socially phobic and control groups, respectively. A repeated measures analysis of variance (ANOVA) was conducted comparing participant and rater's appraisals of task performance and to test whether there was any Rater \times Group interaction. The analysis revealed that the independent rater appraised the speech task performances significantly more positively than self-ratings made by participants, $F(1, 70) = 86.5, p < .01$. The Rater \times Group interaction was also significant, such that the discrepancy between self- and observer ratings was greater for the socially phobic group than the control group, $F(1, 70) = 6.8, p < .01$.

A repeated measures ANOVA was conducted to test the effects of time, group, and Time \times Group for the Performance Questionnaire data. The results showed a significant effect of group such that, overall, the socially phobic group appraised their speech performance significantly more poorly than controls, $F(1, 71) = 19.5, p < .01$. There was also an overall effect of time showing a significant pattern for appraisals of speech performance to improve during the week following the speech task, $F(1, 71) = 24.8, p < .01$. The Time \times Group interaction was also significant, such that the perceptions of performance improved significantly more for the control group during the week following their speech, $F(1, 71) = 4.6, p < .05$. In order to investigate this interaction in more

detail, change scores were calculated from the Time 1 and Time 2 Performance Questionnaire scores. These difference scores were converted into standard units (i.e., z scores) for the two groups separately, and the effect size from Time 1 to Time 2 was calculated for each group. The effect sizes for these standardized change scores were .40 and .13 for the control and clinical groups, respectively. The effect size was 3 times as strong for the control group, indicating greater improvement in perceptions of performance during the week following the speech task.

The results of t tests comparing the frequency of positive and negative post-event rumination for the two groups showed that the socially phobic group engaged in significantly more negative rumination during the week following their speech task than controls, $t(71) = 6.3, p < .01$. However, no significant differences in the frequency of positive rumination emerged between the two groups, $t(71) = 0.65, p > .05$. There was also no significant difference between men and women in the frequency of negative post-event rumination, $t(71) = 0.51, p < .05$, although there was a nonsignificant trend for men to engage in more positive post-event rumination than women would, $t(71) = 2.0, .05 < p < .01$.

It is possible that the greater frequency of negative post-event rumination and poorer perceptions of performance for the socially phobic group were a function of the high levels of co-morbid GAD among the clinical group. To assess this possibility, socially phobic individuals with and without co-morbid GAD were compared on positive post-event rumination, negative post-event rumination, and their Time 1 Performance Questionnaire scores. No significant differences were found for any of these comparisons: negative post-event rumination, $t(41) = -0.26, p > .05$; positive post-event rumination, $t(41) = -0.53, p > .05$; and Time 1 Performance Questionnaire scores, $t(52) = 0.42, p > .05$. Further analyses were carried out to assess whether the socially phobic individuals with comorbid major depressive disorder or dysthymia engaged in more rumination, and perceived their performance more negatively, than those without a comorbid depressive disorder, showing no significant differences: negative post-event rumination, $t(41) = 1.00, p > .05$; positive post-event rumination, $t(41) = 0.02, p > .05$; and Time 1 Performance Questionnaire scores, $t(52) = -0.19, p > .05$.

Relationships Between Appraisal of Performance, Symptom Measures, and Negative Post-Event Rumination

In order to provide an overall measure of social anxiety, the SIAS, SPS, BFNE, and the APPQ Social Anxiety Scale were standardized and a composite mean social anxiety score was created for each participant by summing these standard scores (social anxiety z). Table 3 presents the correlations between this composite social anxiety score and age, sex (coded with a higher score for women), Time 1 and Time 2 Performance Questionnaire scores, the rater's Performance Questionnaire scores, positive and negative post-event rumination scores, and the standardized depression scores.

The results presented in Table 3 show significant correlations between social anxiety and Performance Questionnaire scores, and social anxiety and negative post-event rumination scores. More severe social anxiety was associated with poorer appraisals of speech performance and the tendency to engage in more frequent negative rumination. Similar relationships were found between depression and negative post-event rumination as well as depression and appraisals of speech task performance. There was also a significant negative correlation between scores on the Performance Questionnaire and negative post-event rumination scores, indicating that more negative self-appraisals of speech task performance were related to more frequent negative rumination about the task itself. Table 2 also shows that positive and negative rumination are almost orthogonal constructs, with a correlation of $-.08$.

Several regression models were compared in order to establish the unique variance contributed by each of the variables of interest to negative post-event rumination; the unique variance of individual variables was measured by subtracting the variance accounted for by the model that excluded this variable from the full model that included all variables. The predictor variables included in these analyses were age, sex, social anxiety, depression, and the Performance Questionnaire at Time 1. These analyses allowed testing of the hypothesis that differences in negative rumination between the groups were due to the fact that people with social phobia had higher levels of depression. The regression analyses were also performed to investigate whether self-appraisals of

Table 3
Correlations Between Age, Sex, Performance Questionnaire, Symptoms Measures and Post-event Rumination Scores

	Age	Sex	Time 1 PQ total	Time 2 PQ total	Rater's PQ total	Negative PER	Positive PER	Social Anxiety z
Age	—							
Sex	-.12	—						
Time 1 PQ total	.29**	.04	—					
Time 2 PQ total	.28*	.07	.93**	—				
Rater's PQ total	.09	-.01	.36**	.38**	—			
Negative PER	-.15	-.06	-.68**	-.77**	-.28*	—		
Positive PER	.24*	-.23	.36**	.36*	.18	-.08	—	
Social Anxiety z	-.01	-.23*	-.45**	-.55**	-.28*	.64**	-.10	—
DASS Depression z	.06	-.12	-.37**	-.45**	-.33**	.42**	-.26*	.66**

Note. PQ = Performance Questionnaire total; PER = post-event rumination; Social Anxiety z = standardized Social Anxiety composite score; DASS Depression z = standardized Depression Anxiety Stress Scales score.
* $p < .05$. ** $p < .01$.

speech task performance uniquely explained variance in negative post-event rumination that was not already accounted for by symptom severity.

The results of the regression analyses are presented in Table 4; the β , t , and p values reported in this table are from the analysis for the full regression model. The total model accounted for 62.2% of the variance in negative rumination scores, $F(5, 72) = 22.0, p < .001$. Age and sex were not significant predictors in the model, though there was a nonsignificant trend for men to have higher post-event rumination scores. As can be seen from Table 4, the composite social anxiety score emerged as a significant predictor of negative rumination in the full model, uniquely predicting 12.2% of variance in negative rumination. Although depression and negative rumination were significantly correlated, depression scores did not significantly account for any variance in negative post-event rumination that was not already explained by social anxiety. That is, depression scores did not emerge as a unique predictor of negative rumination in the full model; instead, depression scores significantly predicted negative rumination only when social anxiety scores were not included in the model. The analysis showed that the Performance Questionnaire uniquely accounted for a statistically significant 18.2% of variance in negative post-event rumination scores after variance due to age, sex, social anxiety, and depression had been partialled out, indicating a relationship between self-appraisals of performance and negative rumination that was not mediated simply by symptom severity. A separate analysis of covariance was conducted to investigate

whether the social anxiety and Performance Questionnaire scores remained as significant predictors of negative rumination after variance due to the independent observer's performance ratings had been partialled out. The results showed that both social anxiety and perception of performance remained as significant independent predictors of negative rumination after controlling for the observer's speech performance ratings. The model explained 52.3% of variance in negative rumination scores, $F(5, 71) = 14.5, p < .001$.

A separate multiple regression analysis was conducted to ascertain the amount of variance explained in Time 1 Performance Questionnaire scores by age, sex, social anxiety composite scores, and trait depression scores. The results of this model are detailed in Table 4. The independent observer's ratings of performance were entered into the equation as a covariate. The total model explained 34.0% of variance in Time 1 self-appraisal of performance scores. After partialling out variance accounted for by the independent observer's ratings, the model significantly accounted for variance in Time 1 Performance Questionnaire scores, $F(5, 83) = 8.0, p < .001$. Age and social anxiety scores were the only predictors that explained unique variance in self-appraisal of performance scores, accounting for 7.6% and 4.9% of variance, respectively. The relatively low proportion of variance explained uniquely by age and social anxiety reflects the high intercorrelations between the predictor variables.

Table 4 also reports the results of another multiple regression analysis conducted to establish the amount of variance in Time 2 Performance Questionnaire scores that was accounted for by age, sex, negative rumination, social anxiety composite scores, and depression scores, after controlling for Time 1 Performance Questionnaire scores and the independent observer's rating of performance as covariates. The two covariates significantly accounted for 86.9% of variance in Time 2 Performance Questionnaire scores, $F(2, 71) = 229.3, p < .001$. The model remained significant after controlling for the covariates, $F(7, 71) = 91.96, p < .001$. The remaining variables accounted for an additional 4% of variance in Time 2 Performance Questionnaire scores, and the only remaining predictor that significantly accounted for variance in Time 2 performance scores was negative rumination.

Effect of Treatment

The subgroup of socially phobic individuals who repeated the task following treatment showed a significant improvement in mean clinician severity ratings for social phobia at post-treatment (pretreatment $M = 5.8 \pm 1.0$, posttreatment $M = 3.6 \pm 1.7$), $t(19) = 6.1, p < .01$. Table 2 presents the pre- and posttreatment means and standard deviations for the performance and post-event rumination questionnaires.

A repeated measures ANOVA was carried out to assess the effect of treatment on the Performance Questionnaire for the group of socially phobic individuals who repeated the task following treatment. The results showed a beneficial effect of treatment; that is, the socially phobic individuals appraised their second speech performance (posttreatment) significantly more positively than their first (pretreatment), $F(1, 19) = 20.8, p < .01$. There was no significant effect of time of rating, $F(1, 19) = 1.0, p > .05$, and the Time of Rating \times Treatment interaction was not significant, $F(1, 19) = 0.5, p > .05$. The difference scores for the two posttreatment

Table 4
Results of Separate Regression Models for Negative Rumination, Time 1 Performance Questionnaire (PQ) Scores, and Time 2 Performance Questionnaire Scores

Variable	Unique R^2	β	t	p
Negative rumination				
Age	.00	.03	.34	.74
Sex	.01	.12	1.47	.15
Social Anxiety z	.12	.50	4.65**	.00
DASS Depression z	.00	-.08	.78	.44
Time 1 PQ	.18	-.51	5.67**	.00
Time 1 PQ				
Step 1				
Rater's PQ	.04	.34	3.25**	.00
Step 2				
Age	.08	.30	3.13**	.00
Sex	.00	.02	.22	.83
Social Anxiety z	.05	-.32	-2.54**	.01
DASS depression z	.01	-.12	-.94	.35
Time 2 PQ				
Step 1				
Time 1 PQ	.24	.91	19.60**	.00
Rater's PQ	.00	.07	1.61	.11
Step 2				
Age	.00	.03	.69	.49
Sex	.00	-.04	-.88	.38
Social Anxiety z	.00	-.06	-.90	.37
DASS depression z	.00	-.06	-1.12	.27
Negative rumination	.02	-.20	-3.28**	.00

Note. PQ = Performance Questionnaire; Social Anxiety z = Standardized Social Anxiety composite score; DASS Depression z = Standardized Depression Anxiety Stress Scales score.

* $p < .05$. ** $p < .01$.

Performance Questionnaire ratings were converted into standard units for the treated sample of the socially phobic group and compared with the standardized difference score for the control group. The effect sizes were .10 and .40 for the treated clinical group and control groups, respectively. The effect size for the treated clinical group was similar at pre- and posttreatment, indicating that treatment changed the overall level of self-appraisal, but not the pattern of maintenance for self-appraisal. A *t* test was conducted to compare the independent rater's performance scores for the socially phobic individuals at pretreatment ($M = 52.3$, $SD = 7.3$) and posttreatment ($M = 54.4$, $SD = 6.7$). This analysis showed no differences in the rater's judgement of the social phobics' performance from pre- to posttreatment, $t(19) = 1.96$, $p > .05$.

The mean post-event rumination scores were also compared for the subset of the clinical group who repeated the task after completing a cognitive-behavioral treatment program for social phobia. Following treatment, individuals with social phobia engaged in significantly less negative rumination than they had prior to treatment, $t(19) = 3.5$, $p < .01$. No significant differences from pre- to posttreatment were found for mean positive post-event rumination scores, $t(19) = 1.4$, $p > .05$.

Discussion

The results of the current study largely support and extend current theory and provide novel empirical findings regarding the role of self-appraisals and post-event rumination in social phobia. There were three findings of particular interest. First, the negative self-appraisals of performance in a speech task were maintained over 1 week for people with social phobia, whereas the nonclinical group showed increased positivity about their performance. Second, socially phobic people engaged in more negative rumination about the speech task relative to nonclinical controls. Third, following successful cognitive-behavioral treatment, there was a reduction in both negative self-appraisals and negative rumination.

The current study replicated previous research showing that socially phobic people underestimate their performance relative to nonanxious controls and independent observers (e.g., Rapee & Lim, 1992). Models of social phobia conceptualize this tendency as a reflection of negative mental representations of performance (Rapee & Heimberg, 1997). On the basis of the present data, it appears that this negative mental representation is maintained over time, while becoming more positive in nonclinical individuals. Thus the old adage that time is the greater healer does not seem to apply so well for people with social phobia. Rapee and Heimberg (1997) suggest that the negative mental representation of performance shown by people with social phobia is partly mediated by memories of prior performance. Several studies have now shown that people with social phobia interpret ambiguous social events negatively and remember more negative information about themselves in relation to a social event (Edwards et al., 2002; O'Banion & Arkowitz, 1977; Stopa & Clark, 1993). Furthermore, a recent study has shown a relationship between negative rumination and the recall of negative self-referent information the day following a social interaction (Mellings & Alden, 2000). Taken together, these studies suggest that memory for perceived negative aspects of one's performance and the recollection of past social failures may reinforce a negative mental representation. It is worth noting,

though, that some studies have failed to observe memory bias in social phobia (e.g., Rapee et al., 1994). The results of the current study also suggest that the greater tendency to engage in negative rumination reinforces and maintains the negative mental representation; this process may occur in addition to, or in interaction with, memories of past performance.

Clark and Wells (1995) point to a central role of post-event rumination in social phobia, which is supported by the current results. The results of the regression analysis showed that the degree of negative rumination about a performance event was linked to both the extent of social anxiety and the negative appraisals of performance. The latter finding is consistent with both Rapee and Heimberg's (1997) model suggesting a link between the negative mental representation of the self and rumination, and is also consistent with Clark and Wells's model, which posits a direct relationship between negative perceptions of performance during the task and the frequency of negative rumination. If perceptions of performance obtained immediately after the task are accepted as an indication of the thoughts and feelings processed during the event itself, then this content is directly comparable to the content of the negative rumination. Moreover, the current data do not support a specific role for depression in this relationship; depression scores did not explain any variance in negative rumination that was not already accounted for by negative self-appraisal or symptom severity.

Engaging in negative rumination can be conceptualized as the final stage of processing following an anxiety-provoking performance event for socially phobic individuals. The results of the current study are in keeping with the perspective that post-event rumination is determined by what occurs at earlier stages of processing. That is, social and performance situations that evoke harsher self-appraisals of performance result in more extensive negative rumination. In this respect, the relationship between social anxiety and negative rumination can be conceptualized as a dynamic system; negative rumination may be triggered by negative mental representations of the self while also reinforcing the very same negative mental representation. Thus, to an individual with social phobia, not meeting the inferred standards of the audience suggests that they are performing poorly and may be evaluated negatively, and any indication that their fears have been confirmed suggests that negative beliefs about the self are true (e.g., "If I perform poorly then my speech will be judged negatively, which means that I am a failure"), triggering rumination. In turn, rumination reinforces these beliefs, maintaining the negative mental representation so that the negative self-appraisal is maintained over time. Thus the activation of ruminative processes after a performance event appears to be directly linked to factors maintaining the negative mental representation of the self.

Of particular interest was the negligible correlation between the positive and negative rumination scales, indicating that the underlying constructs are virtually orthogonal. This finding is consistent with ideas discussed by Ingram and Kendall (1987), who suggested that psychopathology is characterized by an asymmetry in the absolute amount of both positive and negative cognition. Although participants in both groups underestimated their speech task performance relative to an independent rater, the control participants were able to later modify the perception of their performance, perhaps indicating that individuals low in anxiety are

able to shift the balance of the cognitive system in favor of positive, as opposed to negative, cognitions.

This is the first study to provide evidence that people with social phobia engage in less negative post-event rumination following a treatment program for social phobia. It is interesting that there was no indication that the socially phobic individuals substituted positive for negative rumination, further supporting the independence of these constructs. However, the possibility remains that individuals with social phobia in the current study ruminated less about the speech following treatment because it was their second exposure to such a task. They may also have participated in other unscheduled speeches during the week following their speech, further enhancing the benefits of exposure. Repeated task exposure to feared social situations is, of course, an important component of cognitive-behavioral treatment for social phobia (Rapee & Sanderson, 1998). One way to investigate the differential contribution made by graded exposure and other aspects of cognitive-behavioral therapy in reducing negative rumination would be to compare people with social phobia who had completed treatment with those who had received no treatment over a similar period of time. Future studies will need to address this limitation, including monitoring for any additional unscheduled speech task exposures by participants.

A further potential limitation of the methodology used in this study relates to the possibility of response demand biases (e.g., Craske & Tsao, 1999; Rapee, Craske, & Barlow, 1990). That is, socially anxious participants may report higher levels of negative rumination simply because they are aware that they are indeed socially anxious. Retrospective self-reported estimates are always subject to such concerns, although we do not believe that this factor could explain all of our results. However, one way for future studies to test this response bias account would be to use a subjective monitoring methodology in which participants continuously self-monitor their negative ruminations over the course of the intervening week. Previous research has established that this technique helps to minimize response demand biases and related problems such as memory deficits and availability heuristics (Craske & Tsao, 1999).

The finding that individuals with social phobia appraised their second (post-treatment) speech task more positively than their first is also consistent with laboratory studies showing that cognitive interventions can improve self-perceptions of social or performance situations for socially phobic people (e.g., Harvey et al., 2000; Rapee & Hayman, 1996). These findings are also compatible with a small number of studies showing that socially phobic individuals rate the quality of their performance in a social situation more positively following treatment (Heimberg et al., 1990, 1998). The current study has replicated this research using a standard measure of self-appraisals of performance instead of the 1-item measures that have previously been used to assess this construct. The socially phobic group may have appraised their second speech task performance more positively because of improved realistic thinking, resulting in less harsh appraisals of performance, either as a result of treatment or repeated task exposure. The Clark and Wells (1995) model predicts that successful treatment should produce improvements in self-appraisals of performance, resulting in reduced negative rumination, because the content of cognitions processed during the speech are less negative. In fact, treatment resulted in improved perceptions of perfor-

mance, but there was no indication that the treated socially phobic group continued to become more positive about their performance through the subsequent week. This contrasts with the pattern of self-appraisal for controls, which became more positive about their performance over the week. This suggests that current cognitive-behavioral treatment for social phobia is effective in changing the overall level of appraisal, but not the maintenance of appraisal. The posttreatment self-appraisals of performance may have failed to improve over time for the socially phobic group because of the maintaining effects of negative rumination. Although the socially phobic group ruminated less negatively following treatment, their level of negative rumination (while improved) was still greater than that of controls. The current treatment program did not specifically address rumination. Therefore, these results suggest that future treatment programs for social phobia may need to target ruminative processes directly.

In summary, the current study has shown that negative appraisals of performance are remarkably stable for socially phobic individuals, whereas nonanxious individuals show an improvement in their perceptions of their performance over time. Socially phobic people also engage in more negative rumination than others, with the best predictors of rumination being social anxiety symptom severity and self-appraisals of performance. The current results also support cognitive-behavioral treatments for social phobia as a means of improving self-appraisals of performance and in reducing negative rumination. The principal findings of this study provide strong support for cognitive models of the maintenance of social phobia, particularly in linking cognitive factors with subsequent negative rumination; future research would benefit from further elucidating the relationships between these cognitive processes in more detail, and in specifying the nature of the therapeutic interventions that help to modify them.

References

- Abbott, M. J., Peters, L., & Rapee, R. M. (2003). *Inter-rater reliability for social phobia and avoidant personality disorder in a large clinic sample*. Manuscript in preparation.
- Abbott, M. J., & Rapee, R. M. (2003). *Rumination in response to social threat, physical threat, and depression-related events*. Manuscript submitted for publication.
- Alden, L. E., Bieling, P. J., & Meleshko, K. G. (1995). An interpersonal comparison of depression and social anxiety. In K. D. Craig & K. S. Dobson (Eds.), *Anxiety and depression in adults and children* (pp. 57–81). Thousand Oaks, CA: Sage.
- Alden, L. E., & Wallace, S. T. (1995). Social phobia and social appraisal in successful and unsuccessful social interactions. *Behaviour Research and Therapy*, 33, 497–505.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington DC: Author.
- Anderson, C. A., & Arnoult, L. H. (1985). Attributional style and everyday problems in living: Depression, loneliness and shyness. *Social Cognition*, 3, 16–35.
- Bruch, M. A., Mattia, J. I., Heimberg, R. G., & Holt, C. S. (1993). Cognitive specificity in social anxiety and depression: Supportive evidence and qualifications due to affective confounding. *Cognitive Therapy and Research*, 17, 1–21.
- Chambless, D. L., & Gillis, M. M. (1993). Cognitive therapy of anxiety disorders. *Journal of Consulting and Clinical Psychology*, 61, 248–260.
- Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. In R. G. Heimberg, M. R. Liebowitz, D. A. Hope, & F. R. Schneier (Eds.),

- Social phobia: Diagnosis, assessment and treatment*. New York: Guilford Press.
- Craske, M. G., & Tsao, J. C. I. (1999). Self-monitoring with panic and anxiety disorders. *Psychological Assessment, 11*, 466–479.
- DiNardo, P. A., Brown, T. A., & Barlow, D. H. (1994). *Anxiety Disorders Interview Schedule for DSM-IV*. San Antonio, TX: The Psychological Corporation, Harcourt Brace.
- Edwards, S., & Dickerson, M. G. (1987). On the similarity of positive and negative intrusions. *Behaviour Research and Therapy, 25*, 207–211.
- Edwards, S. L., Rapee, R. M., & Franklin, J. (2002). Post-event rumination and recall bias for a social performance event in high and low socially anxious individuals. *Cognitive Therapy and Research, 27*, 607–617.
- 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 & Practice, 4*, 291–306.
- Harvey, A. G., Clark, D. M., Ehlers, A., & Rapee, R. M. (2000). Social anxiety and self-impression: Cognitive preparation enhances the beneficial effects of video feedback following a stressful social task. *Behaviour Research and Therapy, 38*, 1183–1192.
- Heimberg, R. G., Dodge, C. S., Hope, D. A., Kennedy, C. R., Zollo, L. J., & Becker, R. E. (1990). Cognitive behavioural group treatment for social phobia: Comparison with credible placebo control. *Cognitive Therapy and Research, 14*, 1–23.
- Heimberg, R. G., & Juster, H. R. (1994). Treatment of social phobia in cognitive behavioural groups. *Journal of Clinical Psychiatry, 55*(Suppl. 6), 38–46.
- Heimberg, R. G., Liebowitz, M. R., Hope, D. A., Schneier, F. R., Holt, C. S., Welkowitz, L. A., et al. (1998). Cognitive behavioural group therapy vs. phenelzine therapy for social phobia: 12-week outcome. *Archives of General Psychiatry, 55*, 1133–1141.
- Ingram, R. E. (1990). Unique and shared cognitive factors in social anxiety and depression: Automatic thinking and self-appraisal. *Journal of Social and Clinical Psychology, 8*, 198–208.
- Ingram, R. E., & Kendall, P. C. (1987). The cognitive side of anxiety. *Cognitive Therapy and Research, 11*, 523–536.
- Leary, M. R. (1983). *Understanding social anxiety: Social, personality, and clinical perspectives*. Beverly Hills, CA: Sage.
- Lepine, J., & Lellouch, J. (1995). Diagnosis and epidemiology of agoraphobia and social phobia. *Clinical Neuropharmacology, 18*(Suppl. 2), 15–26.
- Loranger, A. W., Janca, A., & Sartorius, N. (1997). *Assessment and diagnosis of personality disorders: The ICD-10 International Personality Disorder Examination (IPDE)*. Cambridge, England: Cambridge University Press.
- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Stress Scales*. Sydney, Australia: Psychology Foundation.
- Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy, 36*, 455–470.
- Mellings, T. M., & Alden, L. E. (2000). Cognitive processes in social anxiety: The effects of self-focus, rumination and anticipatory processing. *Behaviour Research and Therapy, 38*, 243–257.
- Merikangas, K. R., & Angst, J. (1995). Co-morbidity and social phobia: Evidence from clinical, epidemiologic and genetic studies. *European Archives of Psychiatry and Clinical Neuroscience, 244*, 297–303.
- Nolen-Hoeksema, S. (1987). Sex differences in unipolar depression: Evidence and theory. *Psychological Bulletin, 101*, 259–282.
- Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depression symptoms. *Journal of Abnormal Psychology, 109*, 504–511.
- O'Banion, K., & Arkowitz, H. (1977). Social anxiety and selective memory for affective information about the self. *Social Behavior and Personality, 5*, 321–328.
- Rachman, S., Gruter-Andrew, J., & Shafran, R. (2000). Post-event processing in social anxiety. *Behaviour Research and Therapy, 38*, 611–617.
- Rapee, R. M., Craske, M. G., & Barlow, D. H. (1990). Subject described features of panic attacks using a new self-monitoring form. *Journal of Anxiety Disorders, 4*, 171–181.
- Rapee, R. M., Craske, M. G., & Barlow, D. H. (1994). Assessment instrument for panic disorder that includes fear of sensation-producing activities: The Albany Panic and Phobia Questionnaire. *Anxiety, 1*, 114–122.
- Rapee, R. M., & Hayman, K. (1996). The effects of video feedback on the self-evaluation of performance in socially anxious subjects. *Behaviour Research and Therapy, 34*, 315–322.
- Rapee, R. M., & Heimberg, R. G. (1997). A cognitive-behavioural model of anxiety in social phobia. *Behaviour Research and Therapy, 35*, 741–756.
- Rapee, R. M., & Lim, L. (1992). Discrepancy between self- and observer ratings of performance in social phobics. *Journal of Abnormal Psychology, 101*, 728–731.
- Rapee, R. M., & Sanderson, W. C. (1998). *Social phobia: Clinical application of evidence-based psychotherapy*. Northvale, NJ: Jason Aronson.
- Rodebaugh, T. L., & Chambless, D. L. (2002). The effects of video feedback on self-perception of performance: A replication and extension. *Cognitive Therapy and Research, 26*, 629–644.
- Stopa, L., & Clark, D. M. (1993). Cognitive processes in social phobia. *Behaviour Research and Therapy, 31*, 255–267.
- Wenzlaff, R. M., Wegner, D. M., & Roper, D. W. (1988). Depression and mental control: The resurgence of unwanted negative thoughts. *Journal of Personality and Social Psychology, 55*, 882–892.

Received August 28, 2002

Revision received August 11, 2003

Accepted August 18, 2003 ■