Behaviour Research and Therapy 50 (2012) 250–257

Contents lists available at SciVerse ScienceDirect

Behaviour Research and Therapy

journal homepage: www.elsevier.com/locate/brat

Self-perception and rumination in social anxiety

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ARTICLE INFO

Article history:
Received 28 November 2010
Received in revised form
17 January 2012
Accepted 24 January 2012

Keywords:
Social anxiety
Post-event processing
Ambiguity
Feedback

ABSTRACT

The present study examined the relationship between perceptions of performance and post-event processing (PEP) following task feedback in individuals with social phobia and matched control participants. Groups of high and low socially anxious participants engaged in a structured 5-min conversation in groups of four people. Following the conversation, false feedback (given in the form of either high scores or moderate scores) was given and self-appraisals of performance, levels of positive and negative mood, and levels of PEP were assessed. Results showed that participants' perceptions of their own performance and levels of positive affect significantly predicted the degree to which they engaged in negative rumination about the task. The moderate score condition was found to be detrimental for socially anxious individuals' self-appraisals and PEP, whereas controls showed no significant difference in self-appraisal and PEP, regardless of feedback. The results are discussed in relation to current cognitive models of social phobia and both treatment implications and directions for future research are explored.

Cognitive models of social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997) outline post-event processing (PEP) as one of the core cognitive processes that maintain social anxiety. The PEP period has been conceptualised as rumination related to perceived inadequacies and mistakes pertaining to one's social performance (Kocovski & Rector, 2007). According to Clark and Wells, the socially anxious individual engages in PEP due to the inherently ambiguous nature of social interactions. As a result of their selective retrieval of threat-related internal and external information, the PEP period is characterised by negative self-perceptions and feelings, which may be exaggerated and distorted. The repetitive review of such negative-laden thoughts serves to maintain the socially anxious individual's negative perception of themselves, thereby maintaining their sense of inadequacy.

The occurrence of PEP as described by Clark and Wells has been well supported in the current literature. A number of studies, using various methodologies including self-report (Fehm, Schneider, & Hoyer, 2007; Kocovski & Rector, 2007; McEvoy & Kingsep, 2006), diary method (Lundh & Sperling, 2002), social and performance situations (Abbott & Rapee, 2004; Dannahy & Stopa, 2007; Edwards, Rapee, & Franklin, 2003; Perini, Abbott, & Rapee, 2006), and experimental manipulations (Field & Morgan, 2004; Kashdan & Roberts, 2007; Kocovski, Endler, Rector, & Flett, 2005; Mellings & Alden, 2000) have demonstrated that compared to healthy controls, socially anxious individuals experience greater levels of PEP following anxiety provoking social situations.

Due to the cumulative support for the role of PEP in cognitive models of social anxiety disorder, many researchers have turned to focus on the factors that influence the level of PEP for socially anxious individuals. For example, Kocovski and Rector (2007) found that levels of social anxiety predicted the degree to which participants engaged in PEP after an exposure task. Similarly, Fehm et al. (2007) found that fear of negative evaluation, which is an aspect of social anxiety, was significantly associated with PEP However, according to Clark and Wells' (1995) model, a specific relationship exists between a negative perception of performance in social situations and the tendency to engage in PEP. That is, the more negative one's self-appraisal is in social situations, the higher the degree of negative PEP. Abbott and Rapee (2004) showed that compared to the control group, socially phobic individuals tend to have more negative appraisals of their own performance following a speech task, and these individuals engaged in more negative post-event rumination. In addition, social anxiety and negative self-appraisal scores significantly predicted PEP, supporting Clark and Wells' (1995) model. Subsequent treatment improved perceptions of performance and reduced negative rumination.

To further study the relationship between negative self-perceptions and PEP, Perini et al. (2006) asked a socially anxious group and a control group to perform an impromptu speech and to appraise their own performance immediately after the task. They found that compared to controls, the socially phobic group engaged

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doi:10.1016/j.brat.2012.01.007

in more PEP, but this relationship was mediated by the participants' perception of their own performance. When perception of performance was statistically controlled, the relationship between social anxiety and PEP became non-significant. Taken together, Abbott and Rapee (2004) and Perini et al. (2006) suggest that the level of PEP may be influenced by an individual's negative misperception of their own performance during anxiety provoking situations, supporting the key role for cognitive factors in PEP.

Even though many studies have shown that socially anxious individuals tend to underestimate their own performance (Alden & Wallace, 1995; Mellings & Alden, 2000; Rapee & Hayman, 1996; Rapee & Lim, 1992; Stopa & Clark, 1993), and that this negative appraisal of performance predicts PEP (Abbott & Rapee, 2004; Perini et al., 2006), there have not been any studies that have directly examined the effect of manipulating perception of performance via feedback on the level of PEP. In a study not specific to social anxiety, Thompson, Webber, & Montgomery (2002) manipulated the valence of feedback on a problem-solving task and examined its effects on negative rumination with a sample of worriers and non-worriers. They found that following an induction to make participants believe they had failed on a task, worriers showed elevated anxiety, had more negative affective reactions and greater intrusive thoughts related to their failure. Because socially anxious individuals are typically concerned with others' evaluation of them and see positive appraisal by other as being crucial to maintaining a stable self-image, manipulating the perceived valence of feedback is likely to have an effect on self-appraisal of social performance and any subsequent rumination.

The aim of the present study was to investigate whether manipulating perception of performance via false feedback has an effect on PEP among a group of non treatment seeking student group with social phobia compared with a group of non-anxious control participants, and if so, whether this effect is different for the two groups. Because social interaction anxiety is a core problem for those with social phobia, a social interaction task, adapted from Leary, Cottrell, and Phillips (2001) was used to elicit social anxiety. We chose to compare responses to two forms of false feedback following a social interaction task for socially phobic and control participants. Participants were randomly allocated to either a high score condition or to a moderate score condition. The high score condition reflected predominantly positive evaluation by three peers following a social interaction task. By comparison, the moderate score condition equated to a "pass score" from three peers following a social interaction, which participants were told was neither a strongly positive nor strongly negative evaluation of their interaction performance. The moderate score condition, as opposed to a condition including predominantly negative evaluation, creates a condition of uncertainty about the nature of the feedback and was intended to enhance anxiety and impact self-appraisals of performance and rumination negatively. Previous research has documented the detrimental effect of conditions of ambiguity for socially anxious people (Amir, Foa, & Coles, 1998; Constans, Penn, Ihen, & Hope, 1999; O'Banion & Arkowitz, 1977; Stopa & Clark, 1993). The two conditions will be directly compared, allowing the impact of social feedback to be assessed.

Given the evidence that the relationship between social anxiety and negative rumination is mediated by perception of performance, and also given that the valence of feedback received on problem-solving tasks can influence subsequent negative rumination and affectivity, the present study hypothesised that

1. In relation to perception of performance, socially anxious individuals who receive moderate scores will report more negative self-appraisal compared to those who receive high scores, while non-anxious controls will not show significant differences in self-appraisal.
2. In relation to PEP, socially anxious individuals who receive moderate scores will report higher levels of PEP compared to those who receive high scores, while non-anxious controls will not show significant differences in PEP
3. Negative self-appraisal of one's interaction performance will significantly predict PEP levels after controlling for self-reported levels of trait and state anxiety and depressive symptoms.
4. In relation to subjective affectivity:
   a) Participants who receive moderate scores will experience a decrease in positive affect (PA) and increase in negative affect (NA) and state anxiety, and these effects are expected to be stronger for the socially anxious group than for the control group.
   b) Participants who receive high scores will experience an increase in PA and decrease in NA and state anxiety. These effects are expected to be stronger for the control group than for the socially anxious group.

Method

One thousand two hundred and eighty seven first year psychology undergraduate students completed the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998). Students with scores above 40 and below 15 were selected to participate in the study in exchange for course credit. Extreme groups were chosen to maximise the chances of finding an effect. A cut-off score of 36 for the screening of high socially anxious individuals has been recommended by Peters (2000). However, the present study employed a more stringent score of 40 to minimise the false positive rate. There are no guidelines for cut-off scores for low socially anxious individuals; thus we employed a score of 15 which allowed for sufficient sample size. In order to attract more participants, community volunteers were also recruited, and were paid a small sum for their travel expenses. Community volunteers were recruited via online advertisements targeting individuals who were either socially anxious or socially confident. These volunteers did not differ from the student sample on any demographic variables. A total of 89 participants who met the SIAS cut-off criteria were administered the Anxiety Disorders Interview Schedule for DSM-IV-TR (American Psychiatric Association, 2000) by the first author (ADIS; DiNardo, Brown, & Barlow, 1994) to determine their clinical status. In addition, the Avoidant Personality Disorder section of the International Personalty Disorder Examination (IPDE; Loranger, Janca, & Sartorius, 1997) was also administered. Only those who met criteria for a principal diagnosis of social phobia were invited to participate in the study. Among those who were administered the ADIS-IV, 8 were excluded for not meeting criteria for social phobia, and 1 participant was unable to complete the interview. The ADIS interviews were videotaped and coded by an independent rater (a third year doctoral level clinical psychology student) who was experienced in coding speech and interaction tasks and was blind to the diagnostic status of the participants. Inter-rater reliability for a principal diagnosis of social phobia was calculated using kappa coefficients, and showed excellent agreement ($k = .87$).

The final sample consisted of 40 participants in the clinical group and 40 participants in the control group, among whom 6 (3 clinical, 3 control) were community volunteers. Within those in the clinical group, 20% also met criteria for Avoidant Personality Disorder. The mean clinician rated severity on a 9 point scale (0–8) for the principal diagnosis of social phobia was 5.2 ($SD = 1.17$) with a higher score indicating greater severity. Within the clinical group, 17.5% of participants also met criteria for another Axis I disorder

(7.5% generalised anxiety disorder, 5% specific phobia, 5% dysthymia). 7.5% participants from the control group also met criteria for a specific phobia, and 2.5% ($n = 1$) met criteria for generalised anxiety disorder.[1] Participants in the control group who met criteria for a specific phobia were retained in the analyses as the phobic content was not related to social or performance anxiety.

The clinical group consists of 12 males and 28 females, with a mean SIAS score of 50.90 ($SD = 8.57$). The low socially anxious group consists of 14 males and 26 females, with a mean SIAS score of 13.25 ($SD = 9.12$). The mean age of the socially anxious and control groups was 20.83 years ($SD = 5.83$) and 20.45 years ($SD = 4.94$), respectively. There was no significant difference in the mean ages of the two groups $t(78) = .31$, $p = .76$. Chi-square tests revealed that there were no significant differences between the socially anxious and control groups in terms of gender, $\chi 2$ (1, $N = 80$) = .23, $p > .05$, marital status, $\chi 2$ (1, $N = 80$) = .21, $p > .05$, education, $\chi 2$ (1, $N = 80$) = 4.80, $p > .05$, and income $\chi 2$ (1, $N = 80$) = .1.85, $p > .05$. The full sample consists of 32.5% males and 67.5% females. 93.8% were single and 6.3% were married or in a de facto relationship. In terms of education, 87.5% of the sample had completed secondary school, 3.75% graduated with a certificate or diploma, and 8.8% had a tertiary degree.

Measures

Symptomatology

Measures of anxious and depressive symptomatology were given to all participants. Measures of anxiety include the Social Interaction and Anxiety Scale, the Social Phobia Scale (Mattick & Clarke, 1998), and the Brief Fear of Negative Evaluation Scale (BFNE; Leary, 1983). The SIAS has been shown to possess high levels of internal consistency and excellent test-retest reliability at 4 week intervals ($r = .92$, $N = 36$) and 12 week intervals ($r = .92$, $N = 9$) (Mattick & Clarke, 1998). The SPS has demonstrated high levels of internal consistency and test-retest reliability, and is able to discriminate between socially phobic and normal populations (Heimberg, Mueller, Holt, Hope & Liebowitz, 1992; Mattick & Clarke, 1998). The BFNE has been shown to have high internal consistency and test-retest reliability at 4 week intervals and adequate psychometric properties (Leary, 1983).

Measures of depressive symptomatology include the Depression Anxiety Stress Scales – Short Form (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 has been found to have excellent psychometric properties (Antony, Bieling, Cox, Enns, & Swinson, 1998).

State mood

The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) consists of 10 descriptors of positive affect (PA) and 10 descriptors of negative affect (NA). For the present study, the PANAS was given at three time points: at baseline (Time 1), after an interaction task (Time 2) and after feedback of performance was given (Time 3). At each time point, participants were asked to rate their mood state "at the moment". Both scales have good internal consistency and test-retest reliability (Watson et al., 1988). Internal consistency from the current sample was high, with α's ranging from .80 to .91 for the PA scale, and from .86 to .89 for the NA scale.

State anxiety

The current study adapted the State Anxiety Rating (SAR) from Rapee and Abbott (2007), which was originally created specifically for speech tasks. Therefore, items with a specific reference to the speech task were amended or deleted, as appropriate. The final amended measure comprised 8 items rated on a 5-point scale ranging from 0 (not at all) to 4 (extremely). The SAR was administered at three time points: at baseline (Time 1), after the interaction task (Time 2) and after feedback of performance was given (Time 3). Total scores on the SAR range from 0 to 32. Internal consistency of the 8 items in the current sample was excellent, $\alpha = .91$.

Performance appraisal

The questionnaire used to measure self-appraisal of performance was adapted from the Performance Questionnaire (PQ; Rapee & Lim, 1992). It instructs participants to rate themselves on a 5-point scale from 0 (not at all) to 4 (very much) on features of social performance, such as keeping eye contact, stuttering, or having a clear voice. Items with a specific reference to the speech task were amended or deleted, as appropriate, resulting in a final questionnaire comprising 15 items. The modified PQ has an internal consistency of .89 in the present sample with total scores ranging from 0 to 60.

Post-event rumination

In the current study, PEP was operationalised as negative cognitions related to the social performance task, measured 10 min after the social interaction. This relatively short timeframe was chosen as the literature suggests that PEP tends to be a stable phenomenon, where socially anxious people experience an increase in negative evaluative thoughts in the aftermath of anxiety provoking social events (Lundh & Sperling, 2002).

The post-event rumination measure employed was modified from the Thoughts Questionnaire (TQ) (Abbott & Rapee, 2004). The TQ was originally created specifically to assess rumination following speech tasks. Therefore, items with a specific reference to the speech task were amended or deleted, as appropriate, resulting in a final questionnaire comprising 22 items. Participants were asked how much they thought about various aspects of the interaction task during the 10 min period following the task. Example of items include "I made a lot of mistakes", "I looked stupid", and "I looked confident". The modified TQ consisted of a 5-point rating scale ranging from 0 (never) to 4 (very often). Items were divided into a positive rumination scale and a negative rumination scale. The modified negative rumination scale has an internal consistency of .95 in the present sample, and the modified positive rumination scale has an internal consistency of .94.

Procedure

Participants were tested in 2 sessions – one to complete the ADIS-IV interview and the other in groups of 4 to complete the experiment. Groups were formed such that each group had two socially anxious individuals and two controls. To control for the amount of social interaction before the interaction task, participants were instructed to sit in opposite corners of the room. The experimenter also ensured that the participants did not know each other prior to the study. Participants completed a battery of symptoms measures, demographics questionnaire, and state anxiety and mood ratings. They were then asked to engage in a 5-min conversation in the middle of the room. They were told that following the conversation, they will be asked to rate each other's performance. No further instructions about the conversation were given. Thereafter, SAR and PANAS measures were collected again, and the researcher instructed the participants to rate each of their team member's performance in the interaction task on a series of bogus visual analogue scales (VAS), adapted from Edwards et al.

[1] The data was re-analysed without this participant and yielded comparable results. Thus, analyses with the full sample will be reported.

(2003). The VASs described different aspects of social performance, such as maintaining eye contact, level of confidence, and enthusiasm. There were 16 such items in total. Participants were asked to rate each of their group member's performance on each of the items by placing a vertical line on the scale between the two anchor points, with 0 being *not at all* and 10 being *extremely*. Participants were told that their ratings on the 16 items would be averaged to form a single number, and that this number would be used by the researcher to provide performance feedback to their team members.

The researcher subsequently pretended to calculate their scores. False feedback was given in the form of 3 numbers that were ostensibly averaged from the 16 ratings given by the other 3 participants in the group. Participants were told that the numbers ranged from 0 to 10, with a higher number reflecting better evaluation of their performance, and vice versa. Participants were randomly assigned either to a high score or moderate score condition. Those who were in the high score condition were given the numbers 8, 7, 8 out of 10 while those in the moderate score condition were given the numbers 5, 5, 5 out of 10. No other feedback was provided.

State anxiety and mood were measured after feedback. Participants were also asked to rate their own performance by completing the modified Performance Questionnaire (adapted from Rapee & Lim, 1992). Participants were asked to wait in the room for a few more minutes while the experimenter prepared for additional questionnaires. After 10 min, the modified TQ was administered (adapted from Abbott & Rapee, 2004). Participants were asked not to interact with each other or engage in any activity during this time. Finally, as a manipulation check, participants were asked to rate on a 5-point Likert Scale from 0 (not at all) to 4 (extremely) how believable they thought the feedback was at the time it was given to them.

Results

Baseline ratings and symptom measures

Table 1 shows the mean and standard deviations for the symptom measure scores and the Time 1 PANAS and SAR scores. Independent samples *t*-tests were used to compare the high and low socially anxious groups, with the experiment-wise error rate controlled at $\alpha = .05$.

As summarised in Table 1, the socially anxious group had significantly higher scores on all measures compared to the control group, except for Time 1 PA, where they showed significantly lower scores.

Table 1
Mean symptom measures and baseline PA, NA and anxiety scores and standard deviations for the high and low socially anxious groups.

Measure	Socially anxious group		Control group		*t*
	M	*SD*	*M*	*SD*	
SIAS	50.9	8.57	13.3	9.12	19.0**
SPS	35.7	12.4	8.2	5.7	12.7**
BFNE	44.7	7.3	27.5	8.0	10.1**
DASS-D	14.4	9.4	4.7	3.7	6.1**
DASS-A	12.9	8.4	4.1	4.4	5.9**
DASS-S	18.9	8.6	8.5	8.1	5.6**
Time 1 PA	19.4	5.0	25.7	8.1	4.2**
Time 1 NA	19.7	6.4	13.7	4.1	5.0**
SAR	10.1	6.0	1.7	1.9	8.4**

Note. SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; BFNE = Fear of Negative Evaluation Scale, short version; DASS-D = Depression Anxiety Stress Scales – Depression subscale; DADD-A = Depression Anxiety Stress Scales – Anxiety Subscales; DASS-S = Depression Anxiety Stress Scales – Stress Subscale; Time 1 PA – Baseline PA measure; Time 1 NA = baseline NA measure; SAR = State Anxiety Rating. $^{**}p < .01$.

Table 2
Mean symptom measures and baseline PA, NA and anxiety scores and standard deviations for the student group and community volunteers.

Measure	Student group		Community volunteers		*t*
	M	*SD*	*M*	*SD*	
SIAS	32.1	20.9	31.7	23.3	0.5
SPS	22.0	16.7	21.2	20.6	0.1
BFNE	36.7	11.5	28.3	8.2	1.7
DASS-D	9.5	8.7	9.7	8.0	0.3
DASS-A	8.2	7.9	12.3	9.3	1.2
DASS-S	13.6	9.6	14.7	13.5	0.5
Time 1 PA	22.4	7.5	23.8	6.3	0.4
Time 1 NA	16.6	6.2	17.7	5.7	0.4
SAR	5.9	6.2	6.5	5.8	0.2

Note. SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; BFNE = Fear of Negative Evaluation Scale, short version; DASS-D = Depression Anxiety Stress Scales – Depression subscale; DADD-A = Depression Anxiety Stress Scales – Anxiety Subscales; DASS-S = Depression Anxiety Stress Scales – Stress Subscale; Time 1 PA – Baseline PA measure; Time 1 NA = baseline NA measure; SAR = State Anxiety Rating.

Independent samples *t*-tests were also used to compare the baseline symptom measures between the student sample and community volunteers. As summarised in Table 2, there are no significant differences on any of the variables between the two groups.

Manipulation check

The mean feedback believability score for the socially anxious group and the control group in the high score condition was 2.9 ($SD = .7$) and 3.4 ($SD = .7$), respectively. The mean feedback believability for the socially anxious group and the control group in the moderate score condition was 3.0 ($SD = 0.8$) and 3.1 ($SD = 0.8$), respectively. This suggests that participants from both feedback conditions felt that the feedback they received was "very believable". A 2 (group) × 2 (condition) ANOVA found no significant main effect for group, $F(1, 76) = 3.09$, $p = .08$, no significant main effect for condition, $F(1, 76) = .34$, $p = .56$ and no significant group by condition interaction $F(1, 76) = 2.12$, $p = .15$.

Effect of feedback on self-appraisal, negative rumination, positive rumination and post-feedback state anxiety

Using believability ratings as a covariate, A 2 (group) by 2 (feedback) multivariate analysis of covariance (MANCOVA) was conducted on the modified PQ scores, NR and PR scores and Time 3 SAR.[2] Using Wilk's criterion as the omnibus test statistic, the effect of believability ratings was found to be non-significant, $F(4, 72) = 2.2$, $p = .07$ and was therefore removed from further analyses. The combined dependent variables resulted in significant main effects for group, $F(4, 73) = 46.29$,$p < .01$, partial $\eta^2 = .72$, and feedback $F(4, 72) = 3.22$, $p < .05$, partial $\eta^2 = .15$. The group by feedback interaction was non-significant, $F(4, 72) = 2.18$, $p = .08$.

To examine the significant multivariate effects, univariate 2 × 2 ANOVAs were conducted on each dependent variable. For the modified PQ scores, there was a significant main effect for group $F(1, 76) = 118.19$, $p < .001$, partial $\eta^2 = .61$. PQ scores were significantly higher for the socially anxious group relative to the controls. Significant group by feedback interactions also emerged for PQ

[2] A MANCOVA was conducted with DASS – Depression scores entered as a covariate. The analysis yielded comparable results. Thus, only the MANOVA results are reported.

scores, $F(1, 74) = 4.8$, $p < .05$, as illustrated in Fig. 1. To follow up on the significant interaction, tests of simple effects (with Bonferroni correction for the number of comparisons made) were carried out ($\alpha = .025$). Tests of the simple effects for feedback showed that for controls there was no significant difference in PQ scores between the two conditions, $t(38) = .18$, $p = .86$. However, for the socially anxious group, there was a significant difference in PQ scores between the positive and the moderate score conditions $t(38) = -3.28$, $p < .01$, with participants having worse appraisals of their performance in the moderate score condition. These results suggest that hypothesis 1 was supported.

A significant main effect for group also emerged for NR scores $F(1, 74) = 101.38$, $p < .001$, partial $\eta^2 = .57$. There was also a significant group by feedback interaction $F(1, 74) = 4.4$, $p < .05$, partial $\eta^2 = .09$, as illustrated in Fig. 2. Tests of simple effects showed that that for controls, there was no significant difference in NR scores between participants in the positive and the moderate score conditions, $t(38) = -.23$, $p = .82$. However, for the socially anxious group, there was a significant difference in negative rumination between the positive and the moderate score conditions $t(38) = -3.38$, $p < .01$, with participants having higher NR scores in the moderate score condition. These results are consistent with hypothesis 2.

With respect to PR scores, there was a significant main effect for group $F(1, 76) = 40.41$, $p < .001$, partial $\eta^2 = .35$. PR was significantly higher for the socially anxious group relative to the controls. Neither the main effect for feedback $F(1, 76) = .23$, $p = .64$, nor the group by feedback interaction were significant, $F(1, 76) = .49$, $p = .49$.

For Time 3 SAR, there was a significant main effect for group, $F(1, 76) = 94.11$, $p < .01$, partial $\eta^2 = .55$. Time 3 SAR was significantly higher for the socially anxious group relative to the controls. Neither the main effect for feedback, $F(1, 76) = 3.06$, $p = .08$, nor the group by feedback interaction were significant, $F(1, 76) = 2.90$, $p = .09$.

Factors predicting post-event rumination

The correlation matrix presented in Table 3 shows significant positive correlations between NR, symptom measures, Time 3 NA and SAR, and PQ scores. PQ scores correlated positively with the symptom measures and Time 3 NA and SAR, but negatively with Time 3 PA.

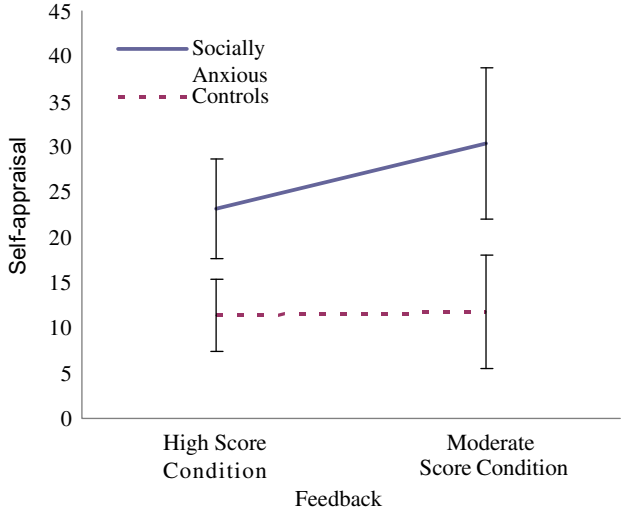

Fig. 1. Self-appraisal scores by condition and group.

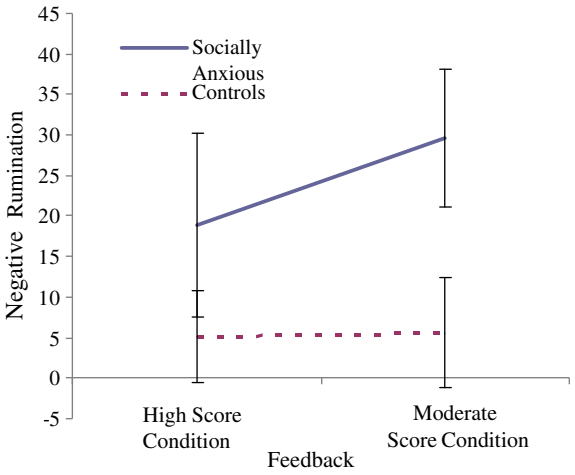

Fig. 2. Negative rumination scores by condition and group.

A hierarchical regression analysis was conducted to determine the factors that predict post-event rumination following the social interaction task. Due to the nature of the study, the symptom measures, including DASS-depression, SIAS, SPS, BFNE, and Time 3 PA, NA and SAR were entered into the model first. Self-appraisal, measured by the modified PQ, was entered on the second step. The results of the regression analyses are presented in Table 4. The full model accounted for 78.4% of the variance in NR scores, $F(1, 71) = 25.49$, $p < .001$. As Table 4 shows, Time 3 PA and PQ scores emerged as significant predictors of negative rumination in the full model, $F(1, 71) = 25.49$, $p < .001$. Self-appraisal uniquely accounted for a 7.8% of variance in NR scores after variance due to the symptom measures and Time 3 PA, NA, and SAR were partialed out. The results of the regression analysis are consistent with hypothesis 3.

Following this finding, a second regression analysis was conducted to explore the factors that predict PQ scores (see Table 4). DASS-depression, SIAS, SPS, BFNE, Time 3 PA, NA and SAR were entered into the model. The full model accounted for 58.3% of the variance in PQ scores, $F(7, 72) = 14.39$, $p < .001$. Only SIAS scores emerged as a significant predictor of PQ, $t(72) = 2.55$, $p < .05$.

State mood and anxiety ratings before and after feedback

Repeated measures analyses of variance (ANOVAs) were conducted to determine the effects of feedback on state PA, NA and SAR ratings for the socially anxious group and the control group.

PANAS: PA

There was a significant three-way interaction between time, group and feedback, $F(1, 76) = 19.96$, $p < .01$, partial $\eta^2 = .20$ (see Fig. 3). To investigate this interaction, separate two-way group × time ANOVAs were conducted for each feedback condition. The two-way interactions were significant for the high score condition, $F(1, 38) = 4.09$, $p = .05$, partial $\eta^2 = .10$ and moderate score condition, $F(1, 38) = 15.21$, $p < .001$, partial $\eta^2 = .29$. Follow up t-tests showed that when given high scores, the controls experienced a significant increase in levels of PA, $t(19) = 2.3$, $p < .05$, while the socially anxious participants' PA remained relatively stable $t(19) = .8$, $p = .93$. When given moderate scores, the controls experienced a significant decrease in levels of PA, $t(19) = 4.7$, $p < .01$, while the socially anxious individuals reported a relatively stable PA, $t(19) = .3$, $p = .7$. These results do not support the fourth hypothesis.

Table 3
Correlations between post-event rumination, symptoms measures, time 3 anxiety, PA and NA scores, and performance questionnaires scores.

	NR	DASS-D	SIAS	BFNE	SPS	Time 3 NA	Time 3 PA	Time3 SAR	PQ
NR	–								
DASS-D	.67**	–							
SIAS	.75**	.61**	–						
BFNE	.69**	.56**	.73**	–					
SPS	.79**	.73**	.82**	.74**	–				
Time 3 NA	.63**	.62**	.57**	.47**	.66**	–			
Time 3 PA	−.16	−.11	−.34**	−.20*	−.28**	−.20**	–		
Time 3 SAR	.77**	.70**	.76**	.61**	.83**	.74**	−.21*	–	
PQ	.78**	.51**	.72**	.57**	.68**	.57**	−.38**	.65**	–

Note. NR = negative rumination scale of Thoughts Questionnaire; DASS-D = DASS-depression scale score; SIAS = Social Interaction Anxiety Scale; BFNE = Fear of Negative Evaluation Scale, short version; SPS = Social Phobia Scale; Time 3 NA = Time 3 negative affect score; Time 3 PA = Time 3 positive affect score; Time 3 SAR = Time 3 anxiety rating, PQ = performance questionnaire total.

Separate two-way interactions were also conducted for each group. For socially anxious participants, there was no significant interaction, $F(1, 38) = .05$, $p = .82$ and no main effect of time $F(1, 28) = .10$, $p = .75$. *t*-tests also showed that amongst socially anxious individuals who received positive and moderate scores, there was no significant difference in PA pre-feedback, $t(38) = .40$, $p = .60$, and PA post-feedback, $t(38) = -.23$, $p = .82$. However, for controls, there was a significant interaction between feedback and time, $F(1, 38) = 26.85$, $p < .01$, partial $\eta^2 = .41$. Follow up *t*-tests showed that there were no significant differences in pre-feedback PA between controls in the high score and those in the moderate score condition, $t(38) = -1.21$, $p = .23$, but there was a significant difference in post-feedback PA for controls in those in the positive and moderate score condition, $t(38) = 2.60$, $p < .05$.

PANAS: NA

There was a significant interaction between time and feedback for NA scores $F(1, 76) = 7.28$, $p < .01$, partial $\eta^2 = .09$. However, the three-way interaction between time, group, and feedback was non-significant, $F(1, 76) = .59$, $p = .44$. Follow up *t*-tests showed that averaging across groups, participants showed a significant decrease in NA after receiving high scores (pre-feedback $M = 15.6$, $SD = 6.2$, post-feedback $M = 13.5$, $SD = 5.5$), $t(29) = 4.87$, $p < .001$. However, neither group showed a significant difference in NA after receiving moderate scores (pre-feedback $M = 17.0$, $SD = 6.7$, post-feedback $M = 17.0$, $SD = 6.3$), $t(39) = .04$, $p = .97$. These results do not support fourth hypothesis.

Table 4
Summary of regression models for NR and PQ scores.

Variable	B	SE B	β	*t*
NR Scores				
Step 1				
DASS-D	.17	.13	.11	1.26
SIAS	.03	.07	.04	.37
BFNE	.15	.10	.13	1.50
SPS	.13	.17	.17	1.23
Time 3 NA	.05	.02	.02	.27
Time 3 PA	.24	.15	.15	2.40*
Time 3 SAR	.31	.17	.17	1.46
Step 2				
PQ scores	.56	.43	.43	5.05**
PQ scores				
DASS-D	−.01	.14	−.01	−.057
SIAS	.19	.07	.38	2.55*
BFNE	.05	.11	.06	.49
SPS	.06	.11	.10	.56
Time 3 NA	.26	.19	.16	−1.93
Time 3 PA	−.20	.10	−.16	1.34
Time 3 SAR	.13	.27	.09	.57

Note. NR Scores = Negative rumination scale of Thoughts Questionnaire; DASS-D = DASS-depression scale score; SIAS = Social Interaction Anxiety Scale; BFNE = Fear of Negative Evaluation Scale, short version; SPS = Social Phobia Scale; Time 3 NA = Time 3 negative affect score; Time 3 PA = Time 3 positive affect score; Time 3 SAR = Time 3 State anxiety rating, PQ scores = modified Performance Questionnaire scores. *$p < .05$; **$p < .01$.

Pre and post-feedback state anxiety ratings

Results for state anxiety ratings showed there was a significant main effect for time, $F(1, 76) = 11.00$, $p < .05$, partial $\eta^2 = .13$, such that regardless of group or feedback condition, participants experienced lower levels of state anxiety following feedback. No other main effects or interactions were significant. This finding was in contrast to the fourth hypothesis.

Discussion

The current study aimed to assess the effect of perception of performance on PEP by manipulating self-appraisals of performance via feedback during an interaction task. The experimental manipulation following a group social interaction task was successful, in that feedback provided was rated to be "very believable" whether scores received by participants were high or moderate, and that both groups believed both types of feedback to the same degree.

The finding that receiving moderate scores as feedback was especially detrimental for socially anxious individuals on their self-appraisal of performance and negative rumination supported hypotheses 1 and 2. Based on the current findings, it is interesting to speculate how the moderate scores were interpreted by the participants. The feedback system used in the currently study was inherently subjective, and it is possible that the way the scores were delivered made participants believe that a score of 5/10 was neither positive nor negative, thus raising the ambiguity of the situation. Indeed, according to Clark and Wells' (1995) model, PEP is more likely to occur when the anxiety provoking situation is ambiguous, as uncertainty triggers the anxious individual to brood over any signs of rejection or failure, perhaps in an attempt to assess not only whether negative evaluation occurred, but the extent and consequences of such negative evaluation or perceived interaction failure. As social situations are inherently ambiguous and unpredictable, intolerance of such uncertainty may be associated with increased distress.

Alternatively, a bias in information processing may also explain the negative effect of receiving moderate scores for socially anxious individuals. Previous findings show that individuals with elevated social anxiety interpret ambiguous situations negatively (O'Banion & Arkowitz, 1977; Stopa & Clark, 1993), and rate their social performance poorly in response to ambiguous social standards (Moscovitch & Hofmann, 2006). This may be due to their tendency to rely on threat cues to interpret sources of social ambiguity (Beard & Amir, 2009). So it is also possible that the socially anxious participants in the current study relied on cues of

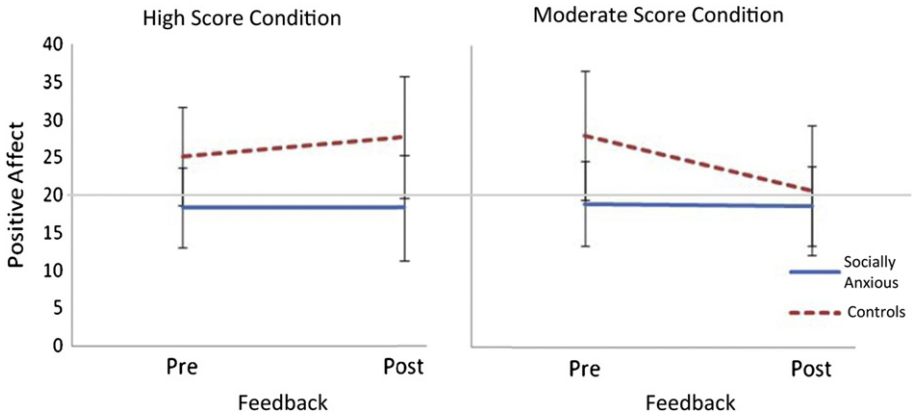

Fig. 3. Positive affect ratings before and after feedback by condition and group.

perceived threat and interpreted the moderate scores to be negative evaluation from their group, and rated their own performance accordingly.

Results from the current study also supported our third hypothesis, highlighting the importance of self-appraisal on cognitive processing in social phobia, even after trait and state anxiety and depressive levels were controlled for. Given that the first model had already accounted for 70.6% of the variance in PEP, and self-appraisal was still able to account for an additional 7.8% of the variance, the current study showed that the cognitive processes that occur during PEP are uniquely influenced by the distorted perceptions that socially anxious individuals form of themselves during anxiety provoking situations. This is in keeping with previous research showing the link between negative appraisals of performance and PEP (Abbott & Rapee, 2004; Dannahy & Stopa, 2007; Perini et al., 2006). Importantly, the current study also demonstrated that such perceptions can be influenced by social feedback. Therefore, it appears that during social situations, the socially anxious individuals' perception of their own performance interacts with external social feedback (when available), and this self-appraisal in turn influences their degree of post-event rumination.

An interesting finding of the current study is the effect of feedback on subjective affectivity in our participants, with results showing mixed support for hypothesis 4. Whereas controls showed expected shifts in their mood in response to the high and moderate scores, socially anxious participants showed a relatively stable level of PA regardless of the type of feedback. According to Clark and Wells (1995), socially anxious individuals experience an increase of self-focused attention during feared situations. Therefore, it is possible that the socially anxious participants did not attend to external feedback, and were simply focused on their own internal image. However, this explanation is unlikely given that the high score condition did reduce self-reported levels of NA for the socially phobic group, suggesting that they did attend to external feedback, but that this did not impact levels of PA.

An alternative explanation is that socially anxious participants did attend to the high score feedback, but were unable to integrate such feedback into their self-perception. This could be due to their fear of positive feedback, as it has been shown that following positive feedback, socially anxious individuals anticipate that their partner would expect them to perform well in subsequent interactions and that they would fall short of their expectations (Alden, Taylor, Mellings, & Laposa, 2008). This hypothesis could be tested by asking participants to engage in a second interaction task following feedback, to assess anticipatory anxiety and levels of task avoidance.

The present results found no condition by group interaction for negative affectivity levels. Regardless of group, participants given high scores had decreased self-reported negative affectivity, while the moderate score condition did not impact levels of NA. Similarly, state anxiety was not impacted significantly by condition, although interestingly, both groups of participants experienced lower levels of state anxiety following feedback. There are two possible reasons for this finding. Firstly, pre-feedback state anxiety was measured immediately after the interaction task, where participants' level of arousal was still relatively high. In addition, this measure was taken when participants were in anticipation of feedback from their group members. Therefore, this is a measure of their anticipatory anxiety to a highly unpredictable and potentially threatening outcome.

Another finding from the current study is that not only did socially anxious individuals report a higher degree of negative rumination compared to controls, but they also reported a significantly higher level of positive rumination. Interestingly, their level of positive rumination was not influenced by feedback. This is a surprising finding that warrants future replication, given previous research showing that socially anxious participants and controls show no differences in levels of positive rumination following a social task (Dannahy & Stopa, 2007; Edwards et al., 2003). A possible explanation for our finding is that socially anxious individuals have a general tendency to ruminate broadly about all aspects of social interactions, but when faced with ambiguity, they experience a greater degree of negative rumination.

The current study is the first of its kind to examine PEP in social phobia by experimentally manipulating self-appraisals via feedback, and it has provided us with important findings about the effect of social feedback on self-appraisal. However, the study is not without limitations. Firstly, an inclusion of a *no feedback* condition would have provided information about the self-appraisal of socially anxious individuals in the absence of any explicit feedback. This would have enabled us to observe the effect of the high score condition on socially anxious individuals' self-appraisal and negative rumination as well as assess whether responses to no feedback are comparable to those found for the moderate score condition.

It was also regrettable that we did not obtain information regarding the specific content of thoughts regarding the feedback. Such qualitative information would allow us to understand the precise nature of perceptions towards the feedback, which could perhaps shed light on the mechanism through which social feedback influences perceptions of the self. It is also important for future research to assess the perceived clarity of feedback to better judge whether the moderate score condition functioned as ambiguous feedback.

In addition, the current study only measured PEP at one time point. However, the literature suggests that PEP is a stable phenomenon, where socially anxious individuals experience an increase in rumination after a socially provoking event, which subsides after a couple of days (Lundh & Sperling, 2002). Therefore, although the current study only measured the first 10 min of the PEP process, we can infer from the literature that what we measured during this early phase is likely to be a relatively stable cognitive process. We do acknowledge, however, that it would have been helpful to have also measured PEP across different time points.

Another limitation is that although the TQ, PQ and SAR were based on standardised measures, they were, however, modified to suit the nature of the current study. The current study showed that the modified versions of these measures had good to excellent internal consistency, but the results may warrant replication in future research.

One should also be careful in generalising the results of the current study to the general population as the participants consisted primarily of university students. Therefore, the sample may be very different from groups in the general population in terms of age and education levels. This limitation can be addressed in future replication by using a more representative sample.

The finding that PEP is heavily influenced by negative self-appraisals of performance has important implications for treatment. It suggests that treatment for socially anxiety could focus on helping socially anxious individuals to gain a more realistic perception of their own performance during social situations, perhaps through a combination of video feedback and cognitive restructuring. However, Abbott and Rapee (2004) found that cognitive-behavioural treatment did not result in improved self-appraisals over time, and that this may be due to the maintaining effects of negative rumination. Therefore, successful treatment may also need to directly target ruminative processes of social events in social phobia.

In summary, the current study has demonstrated the negative effect of receiving moderate scores as feedback on self-appraisals of performance for socially anxious individuals, and that self-appraisal in turn predicts negative rumination. The present results provide support for a line of previous research and cognitive theories of social phobia, and have important implications for treatment. These initial positive findings warrant further investigation in understanding the necessarily ambiguous nature of feedback from social interactions, and the possibly threatening nature of positive feedback to socially anxious people. Understanding and treating negative self-appraisals and ruminative processing remains an important task for researchers and clinicians.

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