Available online at www.sciencedirect.com
ScienceDirect
Behaviour Research and Therapy 44 (2006) 1773–1785
BEHAVIOUR RESEARCH AND THERAPY
www.elsevier.com/locate/brat

The efficacy of videotape feedback for enhancing the effects of exposure-based treatment for social anxiety disorder: A controlled investigation

Jasper A.J. Smits[a,*], Mark B. Powers[b], Rachel Buxkamper[b], Michael J. Telch[b]

[a]*Department of Psychology, Southern Methodist University, Dedman College, P.O. Box 750442, Dallas, TX 75275, USA*
[b]*University of Texas at Austin, USA*

Received 29 March 2005; received in revised form 14 December 2005; accepted 6 January 2006

Abstract

Correcting patients' faulty beliefs concerning social evaluative threats is the hallmark of cognitive–behavioral treatment of social anxiety disorder. The current study examined the efficacy of two videotape feedback procedures as adjuncts to exposure-based treatment. Participants suffering from social phobia ($N = 77$) were randomly assigned to one of four conditions: (a) credible placebo treatment (PLA); (b) exposure + no feedback (EXP); (c) exposure + videotape feedback of performance (PER); or (d) exposure + videotape feedback of audience responses (AUD). Contrary to prediction, the videotape feedback procedures did not enhance the effects of exposure-based treatment. Clinical and theoretical implications are discussed.

Keywords: Social phobia; Fear of public speaking; Cognitive–behavioral treatment; Exposure Therapy; Placebo-controlled randomized clinical trial; Videotape feedback; Mechanism of change

Introduction

Evidence suggests that many social anxiety disorder patients achieve a suboptimal response to exposure-based treatments (CBT) (Davidson et al., 2004; Gould, Buckminster, Pollack, Otto, & Liang, 1997; Heimberg et al., 1998). The focus of recent efforts has therefore been on the development of techniques that enhance CBT. The development of novel techniques has been informed by contemporary psychosocial models of the maintenance of social anxiety disorder (Clark & Wells, 1995; Rapee & Heimberg, 1997). As summarized previously by Clark et al. (2003), these models emphasize four key maintaining factors: (1) an increase in self-focused attention and reduction in observation of other people and their responses; (2) a tendency to make negative inferences about one's appearance and performance; (3) utilization of safety behaviors to anticipated threats; and (4) a tendency to engage in negatively biased anticipatory and post-event processing.

Recently, Clark et al. (2003) developed a new cognitive therapy program, which comprises several innovative procedures, all developed to target the presumed maintaining factors. The novel components

*Corresponding author. Tel.: +1 214 768 4125; fax: +1 214 768 3910.
E-mail address: jsmits@smu.edu (J.A.J. Smits).

0005-7967/$ - see front matter © 2006 Elsevier Ltd. All rights reserved.
doi:10.1016/j.brat.2006.01.001

include safety behavior fading, shifting the patient's attentional focus from the self to the social situation, the fading of maladaptive anticipatory and post-event processing, and videotape feedback of performance. Clark et al. (2003) found that cognitive therapy outperformed placebo, and that it was significantly more effective when delivered without conjunctive pharmacotherapy. Moreover, as evidenced by the large uncontrolled effect size on self-report measures of social anxiety (Cohen's $d = 2.53$), the magnitude of the effect of the new protocol was substantially larger compared to that observed in previous evaluations of CBT for social anxiety disorder (i.e., Cohen's $d = 1.06$; Taylor, 1996).

These results suggest that the inclusion of the novel procedures outlined by Clark et al. (2003) may indeed facilitate the efficacy of CBT. However, as Clark et al. (2003) correctly note, this conclusion may be premature given they did not include a comparison treatment in their study design (i.e., cognitive therapy without new techniques). Moreover, the simultaneous administration of several new procedures precludes the evaluation of each individual technique. Some of the novel techniques included in the trial have indeed established efficacy in controlled studies. For example, Telch and colleagues have found that safety behavior utilization during exposure-based treatment significantly interferes with fear reduction (Powers, Smits, & Telch, 2004; Sloan & Telch, 2002). More specifically, the response rate among participants who were given the option to counter their fear of enclosed spaces by using safety strategies such as opening a window to allow for fresh air was about half of that observed among participants who did not have this option. Similarly, Salkovskis, Clark, Hackmann, Wells, and Gelder (1999) found that the fading of safety behaviors enhanced fear reduction among a sample of agoraphobic patients undergoing in vivo exposure.

Whether videotape feedback methods facilitate social anxiety reduction is not clear. Several studies have now shown that videotape feedback of performance, especially when delivered in conjunction with cognitive preparation, helps correct distorted perceptions of social performance (e.g., Harvey, Clark, Ehlers, & Rapee, 2000; Rapee & Hayman, 1996). However, findings from a recent study of 95 speech-anxious undergraduates randomized to videotaped performance feedback that included cognitive preparation or a neutral preparation control showed that cognitive preparation led to an enhancement in self-performance perceptions but no greater improvement in speech anxiety (Rodebaugh, 2004). As Rodebaugh notes, it is possible that when employed as part of a multi-session exposure-based protocol, performance videotape feedback procedures will not only affect self-perception of performance, but may also affect social anxiety disorder symptoms.

A controlled investigation addressing the question whether performance videotape feedback enhances the efficacy of exposure-based treatment in reducing *social anxiety symptoms* is not only clinically relevant (e.g., logistical issues, focus of therapy), it may also provide further insight into the relative importance of distorted self-perceptions of performance as a maintenance factor in social anxiety disorder. The present study was a placebo-controlled investigation of the efficacy of adding videotape feedback procedures to an exposure-based treatment protocol for public speaking anxiety. Two feedback conditions (performance feedback or feedback of audience responses) were compared to an exposure with no feedback condition, and a credible non-exposure placebo treatment consisting of pulsed audio-photic stimulation. We hypothesized that providing videotaped feedback of the *audience reactions* to the participants' speech immediately following each exposure trial would facilitate anxiety reduction by increasing the salience of threat-relevant disconfirming evidence (i.e., lack of negative evaluative reactions from others). Based on contemporary theories of social anxiety disorder (Clark & Wells, 1995; Rapee & Heimberg, 1997), we hypothesized that the provision of *performance* videotape feedback following in-session speech exercises would facilitate the effects of exposure on social anxiety reduction. Thus, we predicted that participants in both videotape feedback conditions would show *greater* improvement compared to those in the exposure only condition, who in turn would show *greater* improvement than those in the placebo condition.

Method

Participants

Study participants were recruited from the pool of introductory psychology students at the University of Texas at Austin and from the general Austin community. All patients met the following entry criteria: (a) Axis-I diagnosis of social phobia as determined by Composite International Diagnostic Interview

(CIDI-auto; World Health Organization, 1997); (b) significant fear of public speaking as determined by peak fear ratings during an impromptu speech task; (c) fluent in English (both written and verbal); and (d) negative for current psychosis, bipolar disorder, or actively suicidal or past history of seizures (this exclusion criterion was added because of the slight increased seizure risk when administering pulsed photic stimulation among individuals with a history of seizures); and (e) no recent change in psychotropic medications.

Experimental design

Participants were randomly assigned to one of four treatment conditions: (a) Exposure to public speaking plus videotape feedback focusing on the participants' performance (PER); (b) Exposure to public speaking plus videotape feedback focusing on the audience reactions (AUD); (c) Exposure to public speaking without feedback (EXP); or (d) Credible placebo treatment (PLA) consisting of providing pulsed audio and photic stimulations using the Digital Audio Visual Integration Device (DAVID). Outcome assessments were conducted at baseline, 1-week posttreatment, and at 1-month follow-up.

Assessment

Diagnostic assessment

Assessment of DSM-IV (APA, 1994) diagnosis of social phobia was conducted using the anxiety disorders module of the computerized version of the CIDI-auto (version 2.1; World Health Organization, 1997). The non-computerized version of the CIDI has good psychometric properties including high inter-rater reliability, high test–retest reliability and good validity (Andrews & Peters, 1998; Wittchen, 1994) and has been widely used in epidemiological studies (e.g., Kessler et al., 1994). Further, Wittchen, Zhao, Abelson, Abelson, and Kessler (1996) concluded that the CIDI has acceptable test–retest reliability ($\kappa = 0.47$) for the DSM diagnosis of social phobia. Moreover, procedural validity analyses revealed acceptable prospective procedural validity ($\kappa = 0.62$), high positive predictive values (91%), but poor negative predictive values (50%), suggesting that the CIDI may underdiagnose social phobia (Wittchen et al., 1996). The CIDI-auto and the CIDI show excellent agreement, particularly for social phobia ($\kappa = 0.92$). Based on a review of psychometric studies of the CIDI-auto, Andrews and Peters (1998) concluded that the CIDI-auto was "suitable for self- administration in cooperative subjects (p. 80)." Moreover, the CIDI-auto has been employed in several clinical studies of anxiety disorders (e.g., Hazlett-Stevens et al., 2002; Roy-Byrne, Katon, Cowley, & Russo, 2001; Roy-Byrne et al., 2005).

Initial piloting of this instrument in our laboratory and other laboratories (Means-Christensen et al., 2003) confirmed findings reported by Wittchen et al. (1996) suggesting that the CIDI-auto has the potential to yield false negatives for social phobia, particularly for persons with a diagnosis of panic disorder. False negatives receive a code "3" (i.e., meets inclusion criteria, but also meets at least one exclusion criterion) instead of a code "5" (i.e., meets inclusion criteria). Consistent with suggestions that have been published recently (Means-Christensen et al., 2003), all participants who received a "3" for social phobia received additional probing. More specifically, in these cases, participants were assessed further for clinical significance and independence of social phobia (Means-Christensen et al., 2003). With respect to clinical significance, participants with negative responses to the CIDI clinical significance criteria (e.g., told doctor/medical professional about social fears, took medication for social fears, social fears interfere with life or activities a lot), were only reclassified as having social phobia if they (a) reported usually experiencing anxiety in situations when they are the center of attention, and (b) did not have panic disorder that had an age of onset preceding their social fears (see Means-Christensen et al., 2003). With respect to independence of social phobia, participants meeting criteria for panic disorder we reclassified as having social phobia, if they reported that their panic attacks only occurred in social situations. Participants who reported having panic attacks in non-social situations were not reclassified as having social phobia, since we were not able to confidently determine independence of social phobia (see Means-Christensen et al., 2003).

Social anxiety

Liebowitz Social Anxiety Scale—self-report version (LSAS-SR). Originally developed as a clinician administered interview, the LSAS (Liebowitz, 1987) is a widely used instrument for the assessment of social phobia. The LSAS-SR has sound psychometric properties (Baker, Heinrichs, Kim, & Hofmann, 2002).

Clinically significant change—general social anxiety (CSC-General). Consistent with previously employed definitions of treatment response (van Vliet, den Boer, & Westenberg, 1994; van Ameringen, Mancini, Pipe, & Bennett, 2004), a clinically significant reduction in social anxiety symptoms was defined by a 50% drop in the LSAS.

Speech fear. At each of the assessment occasions, participants completed a 3-min speech in front of a video camera and four audience members (2 males and 2 females). The mean audience member age was 22.87 (SD = 3.71), and the ethnic breakdown was similar to that of the study sample. Possible topics were similar to those used in previous studies (e.g., nuclear power, the American health system, seatbelt laws). Participants were given 5 min to prepare a general outline, although the use of notes was not allowed during the actual speech. Immediately following the speech, participants provided a *peak fear* (0–100) SUDS rating.

Clinically significant change—speech fear (CSC-Speech). Consistent with guidelines put forth by Jacobson and Truax (1991), participants were classified as showing CSC in speech fear if: (a) they showed reliable change[1]; and (b) their level of functioning at posttreatment/follow-up as measured by peak fear SUDS fell outside the range of the social phobic population, as defined by a fear level of less than 50 (i.e., 2 SDs below pretreatment mean). This latter criterion was selected due to the unavailability of normative data for a non-social phobic population (see Jacobson & Truax, 1991).

Procedure

Screening

Enrollment of study participants took place between January 2002 and April 2004. The screening consisted of two stages. During Stage 1, potential student participants ($n = 6819$) completed an online version of the LSAS-SR. Those endorsing significant fear and avoidance associated with public speaking ($n = 979$) were invited via email for an individual assessment (Stage 2). Of these potential student participants, 71 expressed interest and agreed to take part in Stage 2 of screening. At the start of Stage 2, community participants ($n = 26$), who were self-referred to the anxiety research clinic, and student participants ($n = 71$) completed the CIDI. Those who met DSM-IV criteria for social phobia ($n = 84$; 87%) were administered the speech task. Individuals who reported only mild fear (i.e., less than 50) during the pretreatment speech were deemed insufficiently phobic and excluded from the study ($n = 3$; 4%). Of 81 participants who were found eligible, 4 decided against participation (i.e., no interest in participation), thus leaving 77 participants who were randomized to one of the four conditions.

Conditions

Procedures common to the three exposure conditions. Eligible participants started treatment immediately following eligibility assessment. They received a rationale emphasizing that fear of public speaking is often fueled by exaggerated beliefs about being negatively evaluated by others. More specifically, social phobia was described as an anxiety disorder that is maintained by several cognitive or behavioral processes such as the tendency to make negative inferences about one's appearance or performance and the increase in self-focused attention and reduction in observation of other people and their responses. Further, the role of avoidance in the maintenance of pathological fear was explained along with instructions emphasizing the importance of repeated confrontations as a method for overcoming fears. To enhance credibility of the treatment and to maintain experimental control, participants received videotaped instructions delivered by MJT.

[1]The reliable change index (RCI; $x_2 - x_1/S_{diff}$) was computed for the peak fear SUDS rating (test–retest $r = 0.80$) obtained during the speech task. Those participants with RCIs greater than 1.96 on this outcome measure were defined as showing reliable change (see Jacobson & Truax, 1991).

Participants assigned to each of the three exposure conditions received a 1-week treatment program consisting of three 75 min-sessions. At the beginning of each session, participants selected a topic and spent 10 min preparing a general outline for their speech. Following this preparation period, participants completed five 3-min speeches in front of a video camera and a four-member audience, without the use of the outline or notes. The exposure trials were interspersed with periods during which participants completed post-exposure ratings and received additional instructions (see below).

Exposure–videotape feedback of performance (PER). Along with the standard rationale, participants assigned to the PER condition received specific instructions outlining the potential benefits of videotape feedback, where the camera is focused on the speaker. More specifically, participants were told that this feedback was designed to help examine the discrepancy between their distorted self-images and the actual displayed image. Videotape feedback was provided following each speech exposure (i.e., 5 times per session, totaling 15 across the three sessions). Commensurate with suggestions outlined by Harvey et al. (2000), videotape feedback was preceded by cognitive preparation. More specifically, after they completed a speech, participants were asked to predict how they appeared during the speech. They were asked to read typical anticipated negative outcomes (e.g., blushing, poor voice quality, being ignored by the audience), taken from the Appraisal of Social Concerns Scale (ASC; Telch et al., 2004) and rate the extent to which they believed these outcomes actually occurred during their speech. Participants were then shown the videotape and specifically instructed to pay attention to how they *appeared* rather than to how they felt during the speech (e.g., as if they were watching someone else). This procedure was repeated for each of the 15 speeches.

Exposure–videotape feedback of audience (AUD). Along with the standard rationale, participants in the AUD condition received specific instructions outlining the utility of videotape feedback, where the camera is focused on the audience. The videotape feedback procedures were identical to those of the PER condition with the exception that while viewing the tape, participants were instructed to focus on the *specific reactions of the audience* to their speech rather than on how they felt during the speech.

Exposure only (EXP). Participants in the EXP condition did not receive videotape feedback. Similar to the videotape feedback conditions, participants in the EXP condition answered questions tapping self-perception of performance and subjective anxiety following each speech. In order to maintain experimental control, each speech trial was interspersed with 3-min video segments (i.e., a documentary titled "Living in Alaska"). Participants were told that these segments served as a break between speeches.

Placebo condition (PLA). Procedures for the PLA condition were modeled after those employed in a previous study (see Powers et al., 2004). Instead of emphasizing the importance of repeated confrontation to the feared situation, participants in the PLA condition received the following specific instructions: "An effective strategy for reducing fear is to induce heightened beta wave brain activity with a device called the Digital Audio Visual Integration Device or DAVID. Beta waves are high frequency, low amplitude brain waves seen while people are awake and relaxed immediately prior to the α wave activity of Stage 1 of sleep. The DAVID induces these brain waves by delivering pulsed audio and visual stimuli. These goggles will deliver flashing lights at 10 Hz (cycles per second) and these headphones will deliver audible ticks (like a metronome) also at 10 Hz (cycles per second) to induce the beta wave relaxation. Prior research has shown that the delivery of pulsed audio and visual stimuli is an effective strategy for enhancing beta wave activity associated with relaxation. The enhanced relaxation brought on by the enhanced beta wave activity will allow you to feel less anxious."

The pulsed audio-photic stimulation was delivered using the DAVID developed by Mind Alive Inc. (9008–51 Avenue Edmonton, Alberta, Canada is used by health care professionals and researchers for inducing relaxation and dissociation (see Leonard, Telch, & Harrington, 1999; Leonard, Telch, & Owen, 2000). It is a small soundboard about the size of a stereo receiver, which includes a headset and plastic mask. The headset emits controllable ticking sounds, similar to those made by a metronome. The plastic mask resembles ski goggles, and delivers pulsed orange lights at controllable rates. In this study, the audio and video stimulus frequency was set at 10 Hz (cycles per second), which is the rate at which the device is suggested to maximally produce relaxation and meditative states. To control for frequency and duration of treatment with the three exposure conditions, participants in the PLA condition received three 75 min sessions, each consisting of five 3-min trials of pulsed audio/photic stimulation.

Steps for enhancing treatment integrity

In order to assure the greatest possible treatment integrity, assessments and treatments were manualized and administered by trained staff. Described in a 60-page manual, training of staff included; (a) didactic orientation to the project provided by the first author (JAJS); (b) observation of assessment and treatment procedures; and (c) role-plays of procedures with trained experimenters. Experimenters were observed and monitored, and provided with feedback regarding adherence to the study protocol by the first author (JAJS). Only those who achieved 100% adherence to the protocol under observation by the first author (JAJS) were allowed to administer assessments or treatments.

Analytic strategy

To examine equivalency of the four groups at baseline, analyses of variance (ANOVAs) were performed for each of the baseline continuous measures and χ^2 analyses were performed for all categorical variables.

Within-group changes across the three assessment periods (pre, post, follow-up) were examined using repeated measures ANOVAs. Three a priori contrasts: (1) EXP vs. PLA; (2) PER vs. EXP; and (3) AUD vs. EXP were examined separately at posttreatment and follow-up to test the major study hypotheses. For continuous measures, these contrasts were tested using repeated measures ANOVAs with assessment period (Time 1 vs. Time 2) or (Time 1 vs. Time 3) as the within-subject factor and the treatment contrasts listed above as the between-subjects factor. Between-group differences in the proportion of participants achieving CSC status at posttreatment and follow-up were examined using χ^2 analyses.

Results

Characteristics of participants

Most participants met criteria for generalized social phobia[2] (GSP; 71%). The sample consisted primarily of students (78%). Fifty-seven percent of the sample was female, and ages ranged from 18 to 51 ($M = 21.73$; $SD = 6.23$). The ethnic breakdown of the sample was 77% Caucasians, 10% Asian-American, 9% Mexican-American, 3% African-American, and 1% Indian-American.

Attrition and attendance

Nine participants (12%) withdrew before the end of treatment (5 (22%) in EXP, 3 (15%) in AUD, and 1 (5%) in PER), and did not complete posttreatment or follow-up assessments (i.e., dropouts). Of completers, 13 (19%) failed to return for follow-up assessment (2 (13%) in PLA, 5 (28%) in EXP, 3 (18%) in AUD, and 3 (17%) in PER).

Among completers, 13 participants attended only 2 sessions (3 (21%) in PLA, 3 (23%) in EXP, 4 (25%) in AUD, and 3 (16%) in PER). Among dropouts, 1 attended only two sessions (1 in AUD). χ^2 analyses revealed that the conditions did not differ significantly in attrition rates or the number of sessions attended. Moreover, those who dropped out did not differ significantly on baseline measures from completers (see Table 1). Subsequent analyses included data from participants who had pre- and posttreatment data on the outcome measures.

[2]Clark et al. (2003) observed a pretreatment LSAS-SR mean of 75.01 ($SD = 23.29$) in a clinical trial with generalized social phobia (GSP) patients. Based on a traditional standard ($M-1$ SD), one could argue that participants with a score below 51 (75–24) can be classified as non-GSP. Mennin et al. (2002) recommended using a cut-off score of 60 for the LSAS clinician administered version. In order to minimize the number of false positives, we decided to use 60 as the cut-off score for GSP.

Table 1
Baseline characteristics of completers and dropouts

Variable	Completers					Dropouts					Completer/DO
	PLA ($n = 15$)	EXP ($n = 18$)	PER ($n = 18$)	AUD ($n = 17$)	p	PLA ($n = 0$)	EXP ($n = 5$)	PER ($n = 1$)	AUD ($n = 3$)	p	p
LSAS											
M	75.93	71.56	73.44	72.00	0.95	—	59.40	70.00	82.00	0.34	0.51
SD	15.07	24.91	22.67	24.23		—	13.18	—	27.40		
Speech fear											
M	81.33	82.78	79.44	78.82	0.84	—	76.00	80.00	76.67	0.97	0.43
SD	14.57	14.06	14.32	13.17		—	11.40	—	20.82		
Social phobia status (%)											
Generalized	86.70	77.80	72.20	76.50	0.79	—	60.00	0.00	100.00	0.36	0.99
Non-generalized	12.30	22.20	27.80	23.50		—	40.00	100.00	0.00		
Age											
M	20.53	20.33	24.94	20.94	0.10	—	25.00	19.00	22.00	0.81	0.50
SD	5.26	3.76	9.12	4.90		—	10.39	—	6.08		
Gender (%)											
Male	40.00	27.80	66.70	29.40	0.07	—	60.00	0.00	66.70	0.49	0.41
Female	60.00	72.20	33.30	70.60		—	40.00	100.00	33.30		
Ethnicity (%)											
African-American	7.10	0.00	0.00	5.90	0.27	—	0.00	0.00	0.00	—	0.60
Caucasian	57.10	70.60	76.50	88.20		—	100.00	100.00	100.00		
Mexican-American	21.40	5.90	5.90	5.90		—	0.00	0.00	0.00		
Asian-American	14.30	11.80	17.60	0.00		—	0.00	0.00	0.00		
Other	0.00	11.80	0.00	0.00		—	0.00	0.00	0.00		
Community status (%)											
Community	20.00	22.20	44.00	17.60	0.25	—	80.00	0.00	0.00	0.10	0.17
Student	80.00	77.80	56.00	82.40		—	20.00	100.00	100.00		

Baseline equivalence

The groups did not differ on any of the demographic or outcome measures at baseline (see Table 1). Further, the conditions did not differ on treatment expectancy and credibility as measured by the Reaction to Treatment Questionnaire (Borkovec & Nau, 1972).

Effects at posttreatment

Within-group effects

Table 2 presents means and SDs for each of the four conditions at each assessment. All conditions showed significant pre- to posttreatment improvement on the LSAS (all p's < 0.05), and speech fear (all p's < 0.01). The percentage of participants reaching CSC on the LSAS was 0%, 28%, 11%, and 6% for the PLA, EXP, PER, and AUD conditions, respectively (see Fig. 1). CSC rates for speech fear were 20%, 61%, 50%, and 35% for the PLA, EXP, PER, and AUD conditions, respectively (see Fig. 1).

Between-group effects at posttreatment

Contrast 1 (EXP vs. PLA) was significant for CSC-General, χ^2 (1) = 4.91, $p < 0.05$, and CSC-Speech, $\chi^2(1) = 5.66$, $p < 0.05$, indicating that a significantly higher proportion of participants in the EXP condition achieved CSC status relative to those in the placebo condition,. The superiority of EXP over PLA was also

Table 2
Means and SDs for the two primary outcome measures at baseline, posttreatment, and follow-up by condition

Variable	PLA			EXP			PER			AUD		
	Pre ($n = 15$)	Post ($n = 15$)	FU ($n = 13$)	Pre ($n = 18$)	Post ($n = 18$)	FU ($n = 13$)	Pre ($n = 18$)	Post ($n = 18$)	FU ($n = 14$)	Pre ($n = 17$)	Post ($n = 17$)	FU ($n = 14$)
LSAS												
M	75.93	66.73	62.23	71.56	52.50	51.69	73.44	55.22	55.14	72.00	61.94	63.71
SD	15.08	15.10	14.88	24.91	26.68	23.40	22.68	21.59	20.85	24.23	27.16	23.44
Speech fear												
M	81.33	58.67	50.00	82.78	43.89	48.46	79.44	43.33	42.86	78.82	50.59	39.29
SD	14.57	19.22	20.00	14.06	29.53	27.03	14.74	20.29	25.25	13.17	21.93	22.00

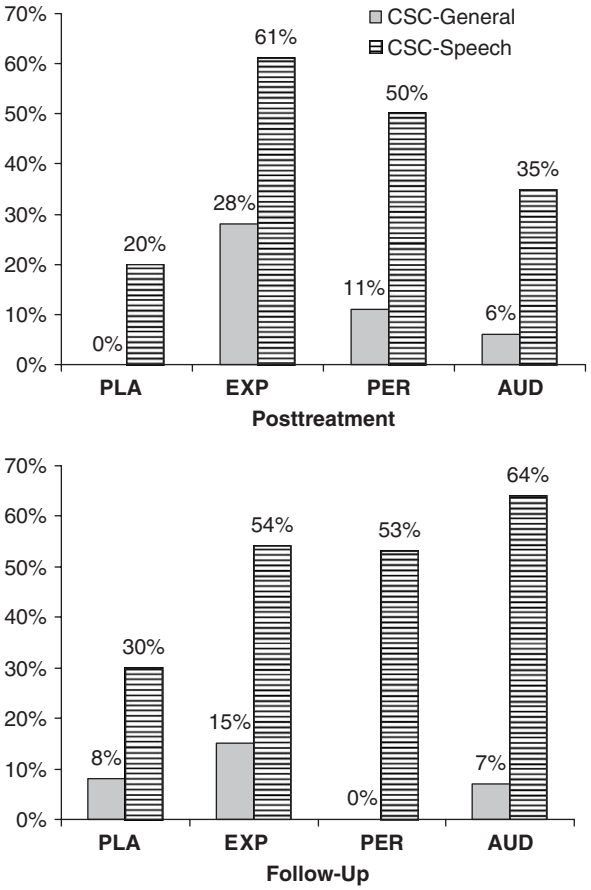

Fig. 1. Clinically significant change rates at posttreatment and follow-up. PLA = placebo treatment, EXP = exposure only, PER = exposure + performance feedback, AUD = exposure + audience feedback, CSC-General = clinically significant change on the LSAS, CSC-Speech = clinically significant change on the speech fear measure.

observed for speech fear $F(1, 64) = 3.32$, $p < 0.04$ (one-tailed) and LSAS scores $F(1, 64) = 2.80$, $p = 0.05$ (one-tailed).

None of the analyses comparing PER vs. EXP (Contrast 2) or AUD vs. EXP (Contrast 3) were significant. Recognizing that a lack of statistical differences may merely reflect inadequate sample size, we computed

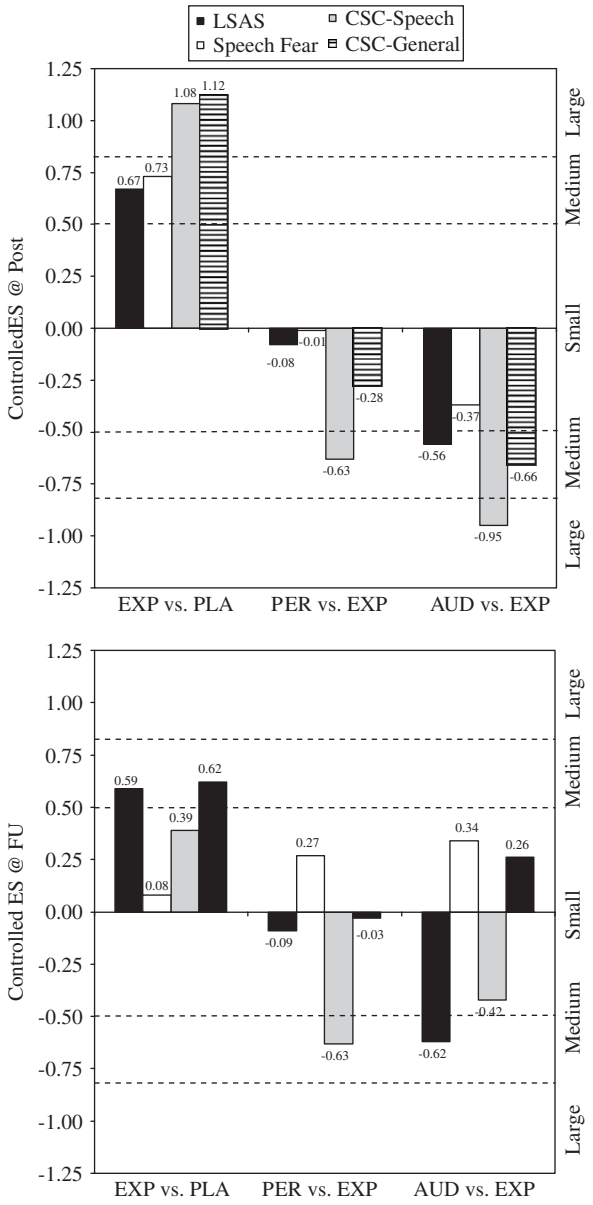

Fig. 2. Effect sizes for the a priori contrasts at posttreatment and follow-up. PLA = placebo treatment, EXP = exposure only, PER = exposure + performance feedback, AUD = exposure + audience feedback, CSC-General = clinically significant change on the LSAS, CSC-Speech = clinically significant change on the speech fear measure.

controlled effect sizes (*d*) to assess the magnitude of differential treatment effects.[3] As can be seen in Fig. 2, which depicts effect sizes for each outcome measure by contrast and assessment period, there was no evidence for an advantage of videotape feedback. Based on Cohen's (1988) classification of effect sizes, the differences between PER vs. EXP were small to medium (see Fig. 2). It should be noted that based on our findings, a *cell*

[3]Controlled effect sizes (*d*) were computed using the following formula = (posttreatment covariance adjusted mean of condition *X*−posttreatment covariance adjusted mean of condition *Y*)/pooled SD. Effect sizes for differences between proportions (i.e., percentage achieving clinically significant change) were computed using probit transformations (Glass, McGaw, & Smith, 1981; Sanchez-Meca, Marin-Martinez, & Chacon-Moscoso, 2003).

size of 786 would be required to detect the largest observed difference on our continuous measures, while a cell size of 50 would be required to detect the largest differences on the dichotomous measures. The magnitude of the differences between EXP vs. AUD was in the small to large range. Minimum cell sizes of 28 and 21 would be required to detect the largest differences on continuous and dichotomous measures, respectively.

We conducted exploratory analyses to examine differences between the PLA and AUD and PER, respectively. To control for Type 1 error, we set the α level at 0.025 for these post hoc comparisons. Results revealed no statistically significant differences for AUD vs. PLA on any of the outcome measures (all p's >0.5). The differences between PER and PLA did not reach statistical significance either (all p's >0.07).

Effects at follow-up

Within-group effects

All conditions showed significant pretreatment to follow-up changes on the LSAS (all p's <0.05), and speech fear (all p's <0.01). The percentage of participants reaching CSC status on the LSAS was 8%, 15%, 0%, and 7% for the PLA, EXP, PER, and AUD conditions, respectively (see Fig. 1). CSC rates for speech fear were 30%, 54%, 53%, and 64% for the PLA, EXP, PER, and AUD conditions, respectively (see Fig. 1).

Between-group effects

In contrast to the findings observed at posttreatment, EXP no longer significantly outperformed PLA on any of the outcome measures. As can be seen in Fig. 2, the effect sizes for the differential changes were in the small to medium range. A minimum cell size of 23 would be required to have sufficient power to detect the largest difference on continuous measures (i.e., LSAS), whereas a cell size of 47 would be required to have sufficient power to detect the largest difference on dichotomous measures (i.e., CSC-Speech).

Consistent with the findings observed at posttreatment, none of the analyses comparing PER vs. EXP (Contrast 2) or AUD vs. EXP (Contrast 3) yielded statistically significant results. Examination of effect sizes revealed that the direction of differential change for each of the two contrasts varied as a function of outcome measure (see Fig. 2). Minimum *cell* sizes of 88 would be required to have sufficient power to detect the largest observed positive differences (i.e., speech fear).

Exploratory analyses revealed no statistically significant differences for the AUD vs. PLA and PER vs. PLA between-group comparisons at follow-up (all p's >0.16).

Discussion

The quest to increase the potency of CBT for social anxiety disorder has led to the development of several innovative techniques. Typical CBT packages now include the provision of videotape feedback of performance following exposure exercises (Clark et al., 2003; Hofmann, 2004; Lincoln et al., 2003). This technique was developed to target the distorted self-perceptions of performance that are ubiquitous among social anxiety disorder sufferers. While associated with significant improvements in self-perceptions of performance (Harvey et al., 2000; Rapee & Hayman, 1996), videotape feedback of performance has not established efficacy in facilitating social anxiety reduction. In fact, one study showed that facilitating improvements in self-perception of performance did not lead to enhanced clinical benefits (Rodebaugh, 2004).

Using a social phobia sample, we compared the efficacy of a three-session exposure-based treatment protocol *with* videotape feedback of performance to the efficacy of a three-session exposure-based treatment protocol *without* any feedback. Performance videotape feedback was delivered commensurate with guidelines put forth by Harvey et al. (2000) (i.e., cognitive preparation; see also Rodebaugh, 2004), and provided following each of the 15 speech exposure exercises. Our results are consistent with the findings from the Rodebaugh (2004) study. Although those who received performance feedback reported a significant reduction in social anxiety, their rate of improvement was no different from those who did not receive feedback following their exposure exercises.

At first glance, these results seem to contradict findings reported by Clark and colleagues (Clark et al., 2003), as they found high efficacy rates for a treatment package that included videotape feedback procedures. However, as mentioned earlier, it is not possible to determine the specific effects of the videotape feedback

procedures in this study, since the treatment protocol included other novel techniques such as the fading of safety behaviors and maladaptive anticipatory and post-event processing.

Why does the provision of performance videotape feedback following in-session exposure exercises fail to augment the efficacy of exposure-based treatment? The study of the mechanism of action of CBT for social anxiety disorder provides a possible explanation. It has been suggested that (durable) social anxiety reduction warrants the modification of the tendency to overestimate disastrous consequences of a negative outcome (i.e., cost bias), rather than a modification of the tendency to overestimate the probability of a negative outcome (i.e., probability bias). More specifically, two studies (Foa, Franklin, Perry, & Herbert, 1996; Hofmann, 2004) have found that the reduction in cost bias accounted for the observed improvement in social anxiety. It can be argued that the provision of performance feedback targets the probability bias, and, in fact, may prohibit a reduction in the cost bias. When instructed to view and compare the actual performance to the imagined performance, a socially anxious individual will likely observe a discrepancy (e.g., ''I appear better than I thought'') and thus change future probability estimates. However, the technique forces the patient to examine his performance, and thereby may implicitly convey the message that it is imperative to perform well. Such confirmation may interfere with the necessary reappraisal of cost (e.g., ''It is okay if I perform poorly'') to experience effective anxiety reduction.

Perhaps it is the lack of explicit focus on the cost bias in our exposure-based treatment protocol that accounts for its limited advantage over placebo. Exposure outperformed placebo on all outcome measures at posttreatment, but the magnitude of the advantage was considerably reduced at 1-month follow-up. Meta-analytic studies have consistently shown that exposure treatments outperform waitlist-control conditions, and that they do not significantly differ from cognitive treatments (Gould et al., 1997; Taylor, 1996). However, Taylor (1996) reported that the advantage of active CBT treatments over placebo was only evident for those interventions that included a cognitive restructuring component. In all fairness, we cannot make any conclusions with respect to the efficacy of exposure-based treatments for social anxiety disorder. The participants in the present trial received substantially less therapist contact compared to participants who participate in clinical trials examining the efficacy of CBT packages for social anxiety disorder. It should be noted that examining the efficacy of a 1-week protocol was *not* an objective of this study. Instead, we designed a short exposure-based treatment protocol to *specifically* investigate the relative efficacy of videotape feedback procedures. Our findings do underscore the importance of including psychological placebo and waitlist control conditions in studies examining treatment mechanisms or the efficacy of novel treatment techniques.

The results of the present study indicate that providing participants with videotape feedback of audience responses following exposure exercises does not enhance fear reduction. In fact, there was some evidence of a delay in improvement on speech fear measures among participants in audience videotape feedback condition compared to participants in the exposure only condition (i.e., CSC-Fear rates were 35% vs. 61% and 64% vs. 54% at posttreatment and follow-up, respectively; see Fig. 1). Our findings regarding the efficacy of audience videotape feedback procedures may seem inconsistent with results reported by Wells and Papageorgiou (1998). They found that instructing patients to focus on external stimuli rather than on the self enhances the effects of exposure. It is possible that the degree of self-focused attention remained unchanged among participants in the audience feedback condition, because they were not specifically instructed to focus on external stimuli *during* exposure. We did not measure this construct, and therefore cannot ascertain that this necessary change occurred. In addition, the information made available on videotape may have been somewhat ambiguous, given that the audience responses were mostly non-verbal in nature and that there was no provision of direct verbal feedback. Ambiguity in the context of feedback may be problematic because socially anxious individuals have a tendency to interpret ambiguous scenarios as negative, even when positive interpretations are available (Amir, Foa, & Coles, 1998; Stopa & Clark, 2000).

Several limitations deserve comment. First, as mentioned above, the sample size was small. Therefore, commensurate with guidelines put forth by Kraemer and colleagues (Kraemer, Wilson, Fairburn, & Agras, 2002), we decided to base our conclusions on controlled effect sizes rather than on p-values. Second, the lack of a waitlist-control condition is a shortcoming of the present study. Although the course of social phobia is typically chronic when untreated (Gould et al., 1997), we cannot rule out that the changes observed over time simply reflect regression to the mean. Further, inclusion of a waitlist condition would potentially allow us to clarify the effects observed for the placebo condition. It should be noted that the lack of a waitlist control

condition does not impair the main objective of the study, which was to examine whether videotape feedback procedures facilitate the efficacy of exposure-based treatments in treating social anxiety.

Taken together, our findings suggest that the provision of videotape feedback of *performance* or *audience responses* following in-session exposure exercises do not facilitate the effects of exposure-based treatment on social anxiety reduction. It is possible that videotape feedback is efficacious when it increases the salience of disconfirmatory evidence relevant to the cost bias. For example, a therapist could instruct a patient to purposely perform poorly during an exposure exercise. The provision of feedback of this type of performance may help the patient to recognize that a poor performance is not a catastrophe. This hypothesis awaits examination.

Acknowledgment

This research was partially funded by Dissertation Grant Award from the Society for a Science of Clinical Psychology.

The authors wish to thank Drs. James Pennebaker, Eric Stice, Patrick Randall, Stephanie Rude, and David Rosenfield for their valuable input with respect to the manuscript.

We would also like to thank Dave Siever, President of Mind Alive Inc., Alberta, Canada for donating the Digital Audio Integration Device (DAVID).

References

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

van Ameringen, M., Mancini, C., Pipe, B., & Bennett, M. (2004). Optimizing treatment in social phobia: A review of treatment resistance. *CNS Spectrums*, *9*, 753–762.

Andrews, G., & Peters, L. (1998). The psychometric properties of the Composite International Diagnostic Interview. *Social Psychiatry and Psychiatric Epidemiology*, *33*, 80–88.

Amir, N., Foa, E. B., & Coles, M. E. (1998). Negative interpretation bias in social phobia. *Behaviour Research and Therapy*, *36*, 945–957.

Baker, S. L., Heinrichs, N., Kim, H. J., & Hofmann, S. G. (2002). The liebowitz social anxiety scale as a self-report instrument: A preliminary psychometric analysis. *Behaviour Research and Therapy*, *40*, 701–715.

Borkovec, T. D., & Nau, S. D. (1972). Credibility of analogue therapy rationales. *Journal of Behavior Therapy and Experimental Psychiatry*, *3*, 257–260.

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

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

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Foa, E. B., Franklin, M. E., Perry, K. J., & Herbert, J. D. (1996). Cognitive biases in generalized social phobia. *Journal of Abnormal Psychology*, *105*, 433–439.

Davidson, J. R., Foa, E. B., Huppert, J. D., Keefe, F. J., Franklin, M. E., Compton, J. S., et al. (2004). Fluoxetine, comprehensive cognitive behavioral therapy, and placebo in generalized social phobia. *Archives of General Psychiatry*, *61*, 1005–1013.

Glass, G. V., McGaw, B., & Smith, M. L. (1981). *Meta-analysis in social research*. Beverly Hills, CA: Sage.

Gould, R. A., Buckminster, S., Pollack, M. H., Otto, M. W., & Liang, Y. (1997). Cognitive–behavioral and pharmacological treatment for social phobia; a meta-analysis. *Clinical Psychology: Science and 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.

Hazlett-Stevens, H., Craske, M. G., Roy-Byrne, P. P., Sherbourne, C. D., Stein, M. B., & Bystritsky, A. (2002). Predictors of willingness to consider medication and psychosocial treatment for panic disorder in primary care patients. *General Hospital Psychiatry*, *24*, 316–321.

Heimberg, R. G., Liebowitz, M. R., Hope, D. A., Schneier, F. R., Holt, C. S., Welkowitz, L. A., et al. (1998). Cognitive behavioral group therapy vs phenelzine therapy for social phobia: 12-week outcome. *Archives of General Psychiatry*, *55*, 1133–1141.

Hofmann, S. G. (2004). Cognitive mediation of treatment change in social phobia. *Journal of Consulting and Clinical Psychology*, *72*, 393–399.

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, *59*, 12–19.

Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshleman, S., Wittchen, H. U., & Kendler, K. S. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. *Archives of General Psychiatry*, *51*, 8–19.

Kraemer, H. C., Wilson, G. T., Fairburn, C. G., & Agras, W. S. (2002). Mediators and moderators of treatment effects in randomized clinical trials. *Archives of General Psychiatry*, *59*, 877–883.

Leonard, K. N., Telch, M. J., & Harrington, P. J. (1999). Dissociation in the laboratory: A comparison of strategies. *Behaviour Research and Therapy*, *37*, 49–61.

Leonard, K. N., Telch, M. J., & Owen, K. K. (2000). Fear response to dissociation challenge. *Anxiety, Stress, and Coping*, *13*, 355–369.

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

Lincoln, T. M., Rief, W., Hahlweg, K., Frank, M., von Witzleben, I., Schroeder, B., et al. (2003). Effectiveness of an empirically supported treatment for social phobia in the field. *Behaviour Research and Therapy*, *41*, 1251–1269.

Means-Christensen, A., Sherbourne, C. D., Roy-Byrne, P., Craske, M. G., Bystritsky, A., & Stein, M. B. (2003). The Composite International Diagnostic Interview (CIDI-Auto): Problems and remedies for diagnosing panic disorder and social phobia. *International Journal of Methods in Psychiatric Research*, *12*(4), 167–181.

Mennin, D. S., Fresco, D. M., Heimberg, R. G., Schneier, F. R., Davies, S. O., & Liebowitz, M. R. (2002). Screening for social anxiety disorder in the clinical setting: Using the Liebowitz Social Anxiety Scale. *Journal of Anxiety Disorders*, *16*, 661–673.

Powers, M. B., Smits, J. A. J., & Telch, M. J. (2004). Disentangling the effects of safety-behavior utilization and safety-behavior availability during exposure-based treatment: A placebo-controlled trial. *Journal of Consulting and Clinical Psychology*, *72*, 448–454.

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–behavioral model of anxiety in social phobia. *Behaviour Research and Therapy*, *35*, 741–756.

Rodebaugh, T. L. (2004). I might look OK, but I'm still doubtful, anxious, and avoidant: The mixed effects of enhanced video feedback on social anxiety symptoms. *Behaviour Research and Therapy*, *42*, 1435–1451.

Roy-Byrne, P. P., Craske, M. G., Stein, M. B., Sullivan, G., Bystritsky, A., Katon, W., et al. (2005). A randomized effectiveness trial of cognitive–behavioral therapy and medication for primary care panic disorder. *Archives of General Psychiatry*, *62*, 290–298.

Roy-Byrne, P. P., Katon, W., Cowley, D. S., & Russo, J. (2001). A randomized effectiveness trial of collaborative care for patients with panic disorder in primary care. *Archives of General Psychiatry*, *58*, 869–876.

Salkovskis, P. M., Clark, D. M., Hackmann, A., Wells, A., & Gelder, M. G. (1999). An experimental investigation of the role of safety-seeking behaviours in the maintenance of panic disorder with agoraphobia. *Behaviour Research and Therapy*, *37*, 559–574.

Sanchez-Meca, J., Marin-Martinez, F., & Chacon-Moscoso, S. (2003). Effect-size indices for dichotomized outcomes in meta-analysis. *Psychological Methods*, *8*, 448–467.

Sloan, T., & Telch, M. J. (2002). The effects of safety-seeking behavior and guided threat reappraisal on fear reduction during exposure: An experimental investigation. *Behaviour Research and Therapy*, *40*, 235–251.

Stopa, L., & Clark, D. M. (2000). Social phobia and interpretation of social events. *Behaviour Research and Therapy*, *38*, 273–283.

Taylor, S. (1996). Meta-analysis of cognitive–behavioral treatments for social phobia. *Journal of Behavior Therapy and Experimental Psychiatry*, *27*, 1–9.

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

van Vliet, I. M., den Boer, J. A., & Westenberg, H. G. M. (1994). Psychopharmacological treatment of social phobia: A double blind placebo controlled study with fluvoxamine. *Psychopharmacology*, *115*, 128–134.

Wells, A., & Papageorgiou, C. (1998). Social phobia: Effects of external attention on anxiety, negative beliefs, and perspective taking. *Behavior Therapy*, *29*, 357–370.

Wittchen, H.-U. (1994). Reliability and validity studies of the WHO-Composite International Diagnostic Interview (CIDI): A critical review. *Journal of Psychiatric Research*, *28*, 57–84.

Wittchen, H.-U., Zhao, S., Abelson, J. M., Abelson, J. L., & Kessler, R. C. (1996). Reliability and procedural validity of UM-CIDI DSM-III-R phobic disorders. *Psychological Medicine*, *26*, 1169–1177.

World Health Organization. (1997). *Composite International Diagnostic Interview (CIDI) researcher's manual*. Washington, DC: American Psychiatric Press Inc.

Further Reading

Peters, L., Clark, D., & Carroll, F. (1998). Are computerized interviews equivalent to human interviews? CIDI-Auto vs. CIDI. *Psychological Medicine*, *28*, 893–901.