Published in final edited form as:
J Anxiety Disord. 2010 October ; 24(7): 663–671. doi:10.1016/j.janxdis.2010.04.007.

The Moderated Effects of Video Feedback for Social Anxiety Disorder

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Abstract

Despite initially positive results, video feedback for social anxiety has never been shown to reduce social anxiety in a controlled experiment with diagnosed participants, and only once with undiagnosed participants. Previous studies arguably did not detect such an effect because of limited assessment of anxiety and potential moderators. We tested video feedback with cognitive preparation among treatment-seeking participants with a primary diagnosis of social anxiety disorder. In Session 1, participants gave an extemporaneous speech and either received the intervention or not. In Session 2, 6 to 14 days later, participants gave a second extemporaneous speech. The intervention improved self-perception of performance, particularly for those participants with the most unrealistically negative impressions of their performance (i.e., high self-observer discrepancy). In addition, the intervention reduced anticipatory anxiety for the second speech for participants with high self-observer discrepancy. These findings extend previous results regarding video feedback and suggest that the intervention may be useful for people with social anxiety disorder and higher self-observer discrepancies for a specific task.

Keywords

Social Phobia; Social Anxiety Disorder; Treatment; Video Feedback; Cognitive Behavioral Therapy

1. Introduction

Higher social anxiety is associated with interpersonal behaviors that are generally maladaptive and detectable in a variety of ways (e.g., Creed & Funder, 1998; Voncken,

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Alden, Bögels, & Roelofs, in press; Walters & Hope, 1998). People who have higher social anxiety are clearly more likely to display maladaptive interpersonal behaviors, yet it is also clear that they generally believe they come across worse than observers believe they do (Heimberg, Hope, Dodge, & Becker, 1990; Rapee & Lim, 1992; Stopa & Clark, 1993). Cognitive behavioral models of social anxiety disorder (Clark & Wells, 1995; Rapee & Heimberg, 1997) suggest that this discrepancy between perception of performance and actual performance helps to maintain social anxiety. *Video feedback* (VF) has therefore been suggested as a method to enhance the effects of exposure through having the person with social anxiety disorder view a videotape of his or her social performance (e.g., Clark & Wells, 1995).

Authors recommending the use of VF typically suggest preparing the recipient of the feedback, most notably with *cognitive preparation* (CP; Harvey, Clark, Ehlers, & Rapee, 2000). CP was designed to accomplish two goals: (a) help the participant clarify what he or she expected to see on the videotape (through a semi-structured interview using self-ratings of specific behaviors), maximizing the potential for participants to observe discrepancies between their beliefs and their videotaped performances and (b) encourage participants to watch the videotape in an objective fashion and avoid re-activating memories of the event that would interfere with attending to the videotape.

Promising results have been reported for cognitive therapy for social anxiety disorder, which contains VF with CP among many elements (Clark et al., 2006; Clark et al., 2003; McManus et al., 2009; although see Aderka, 2009). In contrast, controlled studies of VF and VF with CP have been somewhat less promising. VF alone is not necessarily sufficient to improve self-perception of performance in people who are socially anxious (compare Rapee & Hayman, 1996 with Rodebaugh & Chambless, 2002), but CP increases the effects of VF, producing a robust change in self-perception of performance (Harvey et al., 2000; Kim, Lundh, & Harvey, 2002; Rodebaugh, 2004). Despite the fact that this type of preparation increases the effects of VF, Rodebaugh (2004) reported that it failed to show an effect on anxiety, confidence, or willingness to approach a subsequent speaking task. Similarly, Smits, Powers, Buxkamper, and Telch (2006) found that adding VF with CP to an exposure therapy for social anxiety disorder failed to confer any added benefit for anxiety-related measures over exposure alone. In contrast, a recent study investigating VF with CP for socially anxious adolescents found evidence for reduction in *anticipatory* anxiety over exposure alone (Parr & Cartwright-Hatton, 2009). Neither Rodebaugh's (2004) study nor the study by Smits and colleagues was designed to assess for effects on anticipatory anxiety.

The VF with CP literature has several gaps that might explain such inconsistent results. Parr and Cartwright-Hatton's (2009) study may be the only controlled test of VF with CP that demonstrates reduction in anxiety because other studies failed to specifically assess anticipatory anxiety. A study that assesses both anticipatory anxiety and anxiety during speech performance would therefore be helpful. Further, only one controlled study assessed participants with social anxiety disorder (Smits et al., 2006), and participants in this study were largely recruited from a screened student sample and therefore not representative of a typical treatment-seeking sample. It would be useful to have available a test of VF with CP among treatment-seeking participants. Finally, relatively few studies have examined the possibility that VF with CP might reduce anxiety only among some individuals. Predictors of response to VF with CP would be useful to clinicians seeking to determine whether particular clients would be likely or unlikely to respond well to the intervention, which requires a nontrivial amount of time to conduct.

The most promising candidate for a predictor of response to VF with CP appears to be *self-observer discrepancy*, defined as the degree to which observer ratings fail to predict self-

ratings. Participants with higher self-observer discrepancies differ more strongly from observer predictions when rating themselves, indicating that their beliefs about their performances are particularly distorted. Although self-observer discrepancy can occur in either direction (i.e., a person can believe he or she looks much worse or much better than observers would predict), it seems likely that participants who believe they look far worse than they actually do should benefit the most from VF with CP. In this paper, we use the term *higher self-observer discrepancy* to refer to these participants.

Several studies have examined the possibility that self-observer discrepancy predicts response to VF (with and without CP). Rodebaugh and Chambless (2002) found that higher self-observer discrepancy predicted response to VF alone, such that only participants with higher self-observer discrepancy showed beneficial effects for VF in a second speech task. Similarly, upon re-analyzing the data from Rapee and Hayman (1996), Rodebaugh and Rapee (2005) found that self-observer discrepancy showed similar predictive power in that dataset. Finally, in a third, independent sample, Rodebaugh (2004) found additional evidence that self-observer discrepancy predicted response. However, in each of these examinations, the only outcome variable affected was self-perception of performance. No study has demonstrated that self-observer discrepancy moderates the effects of VF on anxiety in subsequent social tasks. However, none of these studies assessed anticipatory anxiety. Further, the only controlled experiment to examine the effects of VF on participants diagnosed with social anxiety disorder did not test the moderating effects of self-observer discrepancy (Smits et al., 2006).[1]

Our clinical experience suggests to us that VF is a useful intervention for anxiety, at least for some participants. Our impression is that most clinicians who are aware of the technique believe it is effective for reducing anxiety. It may therefore come as a surprise that the literature is not conclusive on this issue, with only one controlled experiment offering direct support and no controlled experiment offering support in regard to reducing anxiety in participants with social anxiety disorder. To take a step in the direction of resolving this issue, we conducted a study of VF with CP in treatment-seeking participants with social anxiety disorder.

We compared VF with CP to exposure alone to maximize the power of the intervention and because there was little reason to believe that either VF or CP alone would be particularly effective. Sessions were conducted 6 to 14 days apart to more closely mimic the usual course of psychotherapy and allow greater generalizeability to a therapy context. We also assessed anticipatory anxiety, as well as anxiety at the end of the social task, to test the possibility that the intervention might have an effect only on some aspects of the anxiety response. Finally, we tested for the moderating effects of self-observer discrepancy. Our hypotheses were that the intervention would produce changes in self-perception of performance and anticipatory anxiety (but not necessarily anxiety at the end of the speech) and that self-observer discrepancy would moderate these effects.

2. Method

2.1 Participants

All participants were seeking treatment at an urban anxiety treatment center in the northeastern United States. Participants took part in the study prior to any treatment at the

[1]The possibility that self-observer discrepancy might predict response to VF is inherent in early reports of the effects of therapeutic use of video, which we have not reviewed for the sake of concision. The interested reader may refer to the review by Hung and Rosenthal (1978) and specific studies by Blount and Pederson (1970), Braucht (1970), and Paredes, Ludwig, Hassenfeld, and Cornelison (1969), among others.

center. To be included in the study, participants had to have been assigned the primary diagnosis of social anxiety disorder. Any participants showing signs of the following during initial assessments were excluded from the study: psychosis, prominent risk of self-harm, alcohol or substance abuse in the last 6 months, an organic mental disorder, or a history of bipolar I disorder. A total of 26 participants completed at least the first session of the study, and 22 of these participants also completed the second session, 10 of whom received VF and CP in Session 1 (the VF with CP group) and 12 of whom received no VF in Session 1(the NVF group). To alleviate ethical concerns, participants in the NVF group were given the intervention after finishing their speeches in Session 2 (i.e., after all measures related to self-perception of performance and anxiety were taken for this study).[2]

In the full sample of 26 participants, most were male (n = 16, 61.5%). Participants reported a variety of ethnicities, including White (n = 12, 46%), Black (n = 6, 23%), Asian or Pacific Islander (n = 3, 12%), and Hispanic (n = 2, 8%); three participants (12%) reported other ethnicities. Participants had an average age of 31.50 (SD = 10.90). Most (n = 24) were judged by clinical interviewers to have the generalized subtype of social anxiety disorder. Severity of social anxiety disorder was judged to be *definitely disturbing/disabling* for 3 participants and *markedly disturbing/disabling* for 13 participants, with the remainder (10) falling between these anchors. For the 24 participants who completed the social interaction anxiety scale (see below), scores indicated moderate to severe social interaction anxiety for the sample (straightforward total: M = 41.62, SD = 12.98; original total: M = 50.58, SD = 14.71). Many participants were diagnosed by clinical interviewers with additional disorders. Data are available for the three most severe disorders (if any) that each participant was diagnosed with beyond social anxiety disorder. Participants met criteria for specific phobia (n = 10), generalized anxiety disorder (n = 3), obsessive compulsive disorder (n = 2), major depressive disorder recurrent (n = 2), and dysthmic disorder (n = 2). A signification minority of the sample (n = 7) were taking psychoactive medication; most (n = 6) reported use of an antidepressant (selective serotonin reuptake inhibitor or serotonin-norepinephrine reuptake inhibitor) and some reported benzodiazepine use (n = 2). No other class of medication was reported by more than one participant.

2.2 Experimenters

Experimenters were the first (n = 4), third (n = 14), and fourth (n = 8) authors. At the time of running the study, experimenters either had a Ph.D. in clinical psychology or were enrolled in a clinical psychology doctoral program. The first author trained the third author, who then ran several participants before training the fourth author with the first author's guidance.

2.3 Measures

Anxiety Disorders Interview Schedule for DSM-IV-Lifetime Version (ADIS-IV-L; DiNardo, Brown, & Barlow, 1994) is a semi-structured clinical interview for assessing the diagnostic criteria for anxiety, depressive, and substance use disorders set forth in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994). Training criteria for interviewers outlined by Brown, Di Nardo, Lehman, and Campbell (2001) were satisfied by all interviewers in the present study. Diagnostic reliability data were available for 14 participants (54%) who were later enrolled in a treatment study. These participants met with an independent assessor who was also trained in the use of the ADIS-IV-L and administered the social phobia section. Agreement

[2]Not considered in the 26 participants are two additional participants who refused to give the first speech due to anxiety and a third participant who received VF with CP with faulty audio in the first session. One of the 26 participants completed Session 2 39 days after Session 1, well outside of the range of days permitted by the design, and is thus considered a drop-out. Substantive results are identical if this participant is included in analyses.

for diagnosis of social anxiety disorder and the subtype of generalized social anxiety disorder was 100%. In addition to information regarding diagnosis, we used the clinician's severity rating (CSR) for descriptive purposes. The CSR is a rating from 0 (*absent*) to 8 (*very severe*) indicating severity of diagnosis; a rating of 4 indicates severity sufficient to warrant diagnosis; thus, all participants in this study had scores of 4 or higher.

Brief State Anxiety Measure (BSAM; Berg, Shapiro, Chambless, & Ahrens, 1998) is a brief version of the State-Trait Anxiety Inventory (STAI; Spielberger, 1983). It contains 6 of the original 20 items (*relaxed*, *steady*, *strained*, *comfortable*, *worried*, *tense*) rated on a 1 (*Not at all*) to 4 (*Very much so*) Likert-type scale. Berg et al. report that this measure showed good internal consistency and a high correlation with the full 20-item scale (r = .93) in unpublished pilot work. The BSAM also displayed good internal consistency in the study by Berg et al. (α = .83) and the current experiment (αs > .79).

Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) is a 20-item measure employing a 0 (*Not at all*) to 4 (*Extremely*) Likert-type scale. The items describe anxiety-related reactions to a variety of social situations (e.g., *I am tense if I am alone with more than one person*). Overall, research on the scale suggests good to excellent reliability and good construct and convergent validity (see Heimberg & Turk, 2002, for a review). Participants completed this measure as part of their standard clinic assessment; three participants from the overall sample, one of whom was from the sample of completers, failed to finish the measure. The SIAS was used primarily for descriptive purposes, and both the original and straightforward total are presented. Available evidence suggests that the reverse-scored items fail to load on the same factor as the other items (Rodebaugh, Woods, Heimberg, Liebowitz, & Schneier, 2006) and appear less related to social anxiety and more related to extraversion than is desirable (Rodebaugh, Woods, & Heimberg, 2007). In the current study, the SIAS displayed very good internal consistency for both the straightforward (i.e., total of items without the reverse-scored items) and original total (αs > .90).

Speech Performance Questionnaire (SPQ; Rapee & Lim, 1992) is a 17-item (5 global items, e.g., *Made a good impression*, and 12 specific items, e.g., *Stuttered*) measure that employs a 1 (*Not at all*) to 4 (*Very much*) Likert-type scale. This measure allows the rating of public-speaking performance by the speaker or by observers and was used by participants and undergraduate research assistants to rate the speeches. The SPQ has been shown to have adequate internal consistency (above .75; Rapee & Lim, 1992; above .88; Rodebaugh & Chambless, 2002), and to allow for adequate rates of agreement between untrained observers (also above .75, Rapee & Hayman, 1996). Internal consistency was very good at each administration in the current study (αs > .79). The measure was scored such that higher scores indicate greater perception of nervousness. Although the SPQ includes items referencing general performance, most of the items focus on nervousness of performance, making it questionable to refer to the measure as a measure of good speech performance per se.

The Expectancy Scale used the first three questions of Borkovec and Nau's (1972) treatment expectancy measure, asking about the logic of the intervention and its likelihood of helping the participant and other people. The scale displayed good internal consistency in the current sample (α = .75).

2.4 Procedure

Please see Figure 1 for a broad depiction of the procedure. Participants were first assessed with the ADIS-IV-L. If the principal diagnosis was social anxiety disorder, the client met no exclusion criteria, and the client expressed interest in treatment at the center, he or she was

given information about the current study. As a part of another study, participants then completed a self-report packet, including the SIAS, and an independent assessor met with the client to independently determine diagnostic status; some of the participants in this sample failed to attend that meeting or complete the SIAS.

The current experiment was conducted in compliance with the local institutional review board and took place in two sessions. Efforts were made to conduct the two sessions between 5 and 15 days apart; thus, time between sessions varied between participants (actual range: 6 to 14 days; median = 7 days). The two experimental sessions were identical in most respects, except as noted. The participant was seated across from a video recorder on a stand attached to a television cart that included a hard-disc recorder and television (the apparatus was present at each session). After giving informed consent (Session 1 only), participants completed a short packet of self-report measures that were mostly unrelated to the current study. These questionnaires differed between the two sessions and in Session 2 included a re-rating of their speech from Session 1 using the SPQ.

After filling out the self-report measures, participants were reminded that they would be giving a three-minute extemporaneous speech that would be videotaped and later rated on the basis of content and quality of presentation. Participants were asked to generate a topic for this speech; they were provided with a list of pre-prepared topics (e.g., “Have radio and TV become too explicit? Argue for or against”) in the event that they did not wish to generate their own. Although participants were not specifically instructed to pick different topics for the two speeches, it was the case that all participants did so. Participants were asked to write their topic down and then note any goals they had for the speech. Goals were collected for exploratory purposes and not analyzed here.

Participants were given three minutes to prepare their speech mentally (i.e., they were not permitted to make notes). This was done to limit the extent to which participants would look down during the course of the speech, because it was expected this would limit the effects of VF with CP. The experimenter left the room while the participant prepared. When the experimenter returned, participants rated their anxiety (using the BSAM) and were asked to begin the speech. If participants stopped the speech, they were encouraged to continue if possible. At the end of three minutes, participants were asked to stop speaking, rate their anxiety using the BSAM and their performance using the SPQ. Participants were then given 10 min alone in the room to relax; they were permitted to do what they pleased within the room. After this 10 min rest period, participants again rated their anxiety using the BSAM.

The session then differed based on whether participants had been randomly assigned to complete VF with CP during Session 1 or not. Participants were unaware of their condition until after the 10-minute rest period. Participants in the VF with CP group first received a detailed rationale for the intervention and rated their expectancy for the intervention. Cognitive preparation was then conducted using a revised and updated version of the manual used in Rodebaugh’s (2004) study, which itself was based directly on the manual used by Harvey et al. (2000). In brief, the experimenter reviewed participants’ ratings of their speech item by item, asking participants to specifically define what the rating meant to them and what they expected to see on the videotape in reference to that item. This process of definition included asking participants to demonstrate physical symptoms (e.g., by showing how much they expected to shake). At the end of this process, participants were asked to imagine their speech as best they could, from beginning to end, and were given two minutes for this task. Participants then completed an imagery rating to measure how vividly they could imagine the speech, as well as the BSAM to measure their level of anxiety at this point. Finally, participants were instructed to view the speech as if watching the videotape of a stranger, to avoid being caught up in remembering how they felt during the speech. The

experimenter then left the room while participants watched the speech. After watching the speech, participants re-rated the speech using the SPQ and completed the BSAM to rate their level of anxiety.

Participants who did not receive VF with CP in the first session (NVF group) were told that they would not receive an intervention during this session and should instead feel free to continue to relax. Participants' times during this session were yoked to another participant's times during VF with CP, such that the participants not receiving VF with CP filled out the BSAM twice and the SPQ once at the same time that a previous participant completed these measures during the course of the intervention. The exception was the first participant, who was assigned to a time of 8 minutes between the experimenter's explanation of the condition and the BSAM and 12 minutes between the experimenter's explanation of the condition and SPQ, which was expected a priori to be a reasonable amount of time for the intervention. Participants were yoked to participants of the same gender and within the same experimenter's group of participants when possible.

At the end of each session, participants received $10 for their time. At the end of the second session, participants were debriefed.

2.5 Coding

Three coders, blind to condition of participants, diagnosis of participants[3], order of speeches, and design of the study, coded overall speech performance using the SPQ. Coders met once to discuss with each other how they had interpreted the scale items during initial practice speeches given by undergraduate participants as a part of another study. They rated all speeches for this study independently. Reliability was computed using the two-way random intra-class correlation coefficient for the average of the coder ratings, using the absolute agreement definition. This is a very conservative estimate of reliability because it penalizes for departures from absolute agreement. The reliability for the average of the ratings of the three coders was excellent for each speech (Speech 1, ICC = .88; Speech 2, ICC = .85). Given the excellent reliability, three speeches (one for Speech 1, 2 for Speech 2) that did not retain audio due to equipment problems had their total score imputed. For speeches lacking audio, coders had been instructed to rate all possible items; 9 of the 17 SPQ items could be rated without audio because they make reference to visual aspects of the speech. Multiple regression was used to predict each observer's total rating of these speeches using the 9 existing ratings from all coders. In each regression, some items were not included because they were constants, did not add to prediction, or could not be accommodated given degrees of freedom. In regard to Session 1 speeches, these regressions predicted at least 82% of the variance in each coder's rating; in regard to Session 2 speeches, all variance was accounted for. The predicted values for the three speeches in question are used below.

3. Results

3.1 Initial Equivalence and Drop-Out by Condition

Participants completing the study (n = 22) were assessed for initial equivalence through a multivariate analysis of variance (MANOVA) in which condition (VF with CP or NVF) predicted initial speech rating, anticipatory anxiety, and post-speech anxiety. There was no indication of a multivariate effect (p = .947), nor any indication of any univariate effect (ps > .76). The largest difference was in regard to anxiety immediately after Speech 1 and was

[3]Post-rating interviews with the coders revealed that they suspected that some, but not all of the sample had social anxiety disorder; none of the coders suspected that all of the participants had social anxiety disorder.

small (d = 0.13). There was therefore no evidence of differences between conditions on pre-intervention measures. Participants completing the study also did not differ by condition in regard to gender, age, ethnicity, medication use, or days between sessions (all ps > .27). There was no association between condition and drop-out, $\chi^2(1) = 0.03$, n = 22, p = .867.

3.2 Intervention Time Equivalence and Manipulation Check for Cognitive Preparation

Focusing on participants who completed the study (n = 22), the intervention for VF with CP participants took an average of 1454.10 seconds (SD = 263.13), or about 24 minutes, from the point of the experimenter explaining the intervention to the rating of the speech after viewing the videotape. For participants in the NVF condition, who waited during this time, the interval was somewhat shorter (M = 1380.08, SD = 302.54). The difference between these times was neither statistically significant, $t(19.95) = 0.61$, p = .546, nor large (d = 0.26).

A manipulation check was conducted to determine whether participants were successful in creating a clear image of their speeches during CP. In contrast to the analyses reported below, here we focused on the session in which participants received VF with CP, whether they were in the VF with CP condition or the NVF condition (n = 24). Participants reported moderate vividness of the visual image in the preparation for VF with CP (M = 5.33, SD = 2.30) and slightly below moderate vividness of sounds (M = 4.50, SD = 1.82) and feelings that it was as if the event was actually happening (M = 4.79, SD = 2.23). These values are comparable, although slightly lower, than values reported by Rodebaugh (2004) for speech-anxious undergraduates undergoing the same intervention. The CP was thus about as successful in this sample as in Rodebaugh's analogue sample in producing a clear and compelling imagined image of the speech.

3.3 Effects on Self-Perception of Performance

The following analysis was conducted with participants who completed the study; analysis of full data by time-point or by carrying last observations forward yielded substantively identical results. To test whether VF with CP had an effect on perception of speech performance over time, a repeated-measures analysis of variance (ANOVA) was conducted with the dependent variables of SPQ ratings pre-intervention Speech 1, post-intervention Speech 1, re-rating of Speech 1 at Session 2, and initial rating of Speech 2. Thus, this ANOVA tested whether self-perception of speech performance changed across time from immediately after the speech in Session 1 to immediately after the speech in Session 2. Condition (VF with CP vs. NVF) and Time were the independent variables.

A Time × Condition interaction was expected and found: Wilk's Λ = .56, $F(3, 18) = 4.69$, partial η^2 = .44, p = .014. Follow-up t-tests were conducted on the simple change scores from Speech 1 ratings to later time-points. These tests demonstrated that the effect for Condition was strongest immediately after the intervention at Speech 1, $t(20) = 3.75$, p = .001, and weakened over time, with a smaller difference in regard to re-rating Speech 1 at Session 2, $t(11.81) = 2.58$, p = .024, and a trend for a difference in rating Speech 2, $t(20) = 1.73$, p = .099. The smallest effect, for Speech 2, remained relatively large (d = 0.73). Evidence thus suggested that VF with CP produced change in self-perception of performance, although less confidence can be placed in the generalization of these effects to a second speech. See Figure 2, which makes it clear that the general effect was for the VF with CP group to improve in their self-perception immediately after the intervention. Although the NVF group showed some tendency toward similar improvement, it was not sufficient to convincingly bridge the gap produced by the intervention.

3.4 Effects on Anxiety

A repeated-measures MANOVA was then conducted to test the effects of the intervention on anxiety. A repeated-measures MANOVA was used to model both time (Speech 1 and Speech 2) and assessment point (pre-speech and post-speech). Independent variables were Time and Condition. Based on previous studies, which are equivocal, a Time × Condition interaction might not be expected, although it would be hypothesized based on the intent of the intervention. Such an interaction was clearly not found here in regard to the multivariate effect, Wilk's $\Lambda = .95$, $F(2, 19) = 0.61$, partial $\eta^2 = .05$, $p = .607$, or univariate effects (ps >. 38). However, as would be expected, Time had a significant multivariate effect, Wilk's $\Lambda = .64$, $F(2, 19) = 5.35$, partial $\eta^2 = .36$, $p = .014$; examination of means made it clear that habituation occurred across sessions, with participants having generally lower anxiety ratings for Speech 2 than Speech 1. Examination of the simple differences in anxiety ratings across time by condition showed that mean change was in the direction of participants receiving VF with CP showing more reduction of anxiety, yet these effects were medium in size at best ($d = 0.38$ for pre-speech anxiety; $d = 0.23$ for post-speech anxiety). A total sample size of 220 participants would have been required to detect the effect for pre-speech (anticipatory) anxiety with power of .80 in an independent samples, two-tailed t-test (Faul & Erdfelder, 1992).

3.5 Moderation by Self-Observer Discrepancy

Consistent with previous studies (Rodebaugh, 2004; Rodebaugh & Chambless, 2002; Rodebaugh & Rapee, 2005), a self-observer discrepancy variable was computed as the standardized residual of self-ratings of Speech 1 with observer ratings partialled out. Observer ratings were averaged across the three raters. The observer ratings correlated moderately with self-ratings ($r = .43$, $p = .049$). The previous studies suggested that self-observer discrepancy had minimal relationships with trait social anxiety symptoms; this was also the case here: Self-observer discrepancy failed to show a significant relationship with either the straightforward score of the SIAS ($n = 20$) or clinician's severity rating (ps > .37 for correlations). Thus, this variable does not serve as a proxy for severity of social anxiety disorder in the analyses below. Self-observer discrepancy was highly correlated with self-rating ($r = .90$, $p < .001$), which has been true in other samples (e.g., Rodebaugh & Rapee, 2005) and would be expected if no participants show overly positive estimates of their own performance. As noted by Rodebaugh and Rapee, in most analyses regarding socially anxious individuals, it would be expected that initial self-rating, simple difference between self and observer rating, and the residualized variable used here should all yield very similar results. We use the residualized variable because it is most consistent with the theoretical understanding of self-observer discrepancy as the degree to which self-rating cannot be predicted by observer rating.

When outcomes investigated below involved change (e.g., change in anxiety), it was represented by simple change scores, but analyses were also conducted using residual gain scores; no substantive differences were found in effect sizes. We conducted these analyses using both methods because opinion is divided regarding the best way to investigate change. For all multiple regressions, we were careful to attend to the possibility that individual cases could have undue influence on the regression line. This problem is always of concern in multiple regression, but is of particular concern in smaller samples, such as the sample used here. We therefore consulted the statistic SDBETA for all cases in each analysis, using the recommended cut-off of 1.0 to identify cases that had undue influence on the regression line (Neter, Kutner, Nachtsheim, & Wasserman, 1996). There was no evidence of undue influence in any regression, indicating that it the following results were not due to individual cases.

Perception of speech performance—In previous studies, self-observer discrepancy predicted strength of response to VF with CP in terms of self-perception of performance. Multiple regression was used to predict change in self-perception of performance (a) at the end of Session 1, (b) at the re-rating of the Session 1 speech at the beginning of Session 2, and (c) initial rating of Session 2 speech. For each regression, self-observer discrepancy, condition (VF with CP vs. NVF), and their interaction were used to predict the simple change score from pre-intervention phase of Session 1 to the later speech rating.

As expected, the interaction between self-observer discrepancy and condition was statistically significant in predicting change in self-perception from pre- to post-intervention in Session 1 and from initial rating of Speech 1 to the re-rating of Speech 1 in Session 2 (|part *r*s| > .40, *p*s < .03). These interactions were probed at one standard deviation above and below the mean as recommended by (Aiken & West, 1991). In each case, VF with CP had a stronger effect for improving self-perception of performance for participants with higher self-observer discrepancies (|part *r*s| > .63, *p*s < .003) than for participants with lower self-observer discrepancies (|part *r*s| < .05, *p*s > .77). These findings are consistent with all other studies. However, for change from Speech 1 to Speech 2, effects were not as hypothesized. Here, self-observer discrepancy was a significant predictor in the expected direction, with higher self-observer discrepancy predicting more of a reduction in ratings of negative aspects of performance (part $r = -.51$, $p = .014$), but the interaction between self-observer discrepancy and condition was not significant (part $r = .21$, $p = .28$). Thus, higher self-observer discrepancy did not promote the generalization of the effects of VF with CP on self-perception of performance to a second speech.

Speech anxiety—Two regression equations were used to predict change in anticipatory and post-speech anxiety with the independent variables of condition, self-observer discrepancy, and their interaction. For post-speech anxiety, there was no effect for the interaction (part $r = .05$, $p = .814$). For anticipatory anxiety, however, there was a statistically significant interaction (part $r = .52$, $p = .012$).

This interaction was probed at one standard deviation above and below the mean as recommended by (Aiken & West, 1991). Probing revealed that VF with CP reduced anticipatory anxiety for those participants with higher self-observer discrepancy (part $r = .54$, $p = .010$) but not for those with lower self-observer discrepancy (part $r = -.27$, $p = .172$). In fact, the tendency for participants with lower self-observer discrepancy was to show *less* of a decrease in anticipatory anxiety after VF with CP. These effects are illustrated in Figure 3, which displays effects on anticipatory anxiety by the intervention and self-observer discrepancy (above or below zero). In interpreting Figure 3, it is important to note that participants with higher self-observer discrepancy experienced more anticipatory anxiety for the first speech. Those participants with higher self-observer discrepancy who received VF with CP were more similar to participants with lower self-observer discrepancy at Speech 2, due to a clear reduction in their anticipatory anxiety. Participants with higher self-observer discrepancy who did not receive VF with CP, on the other hand, had elevated anticipatory anxiety that persisted for the second speech. In contrast, participants with lower self-observer discrepancy showed no beneficial effects for VF with CP.

Post-hoc test for anxiety confound—In our experience, clients are often more anxious during exposures if they are keeping in mind that they will see the video of their performance. Recall that participants in the NVF condition received VF with CP at the end of Session 2 due to ethical concerns that they would otherwise be denied a potentially beneficial intervention. Participants were told in Session 1 that they would receive VF with CP in one of the sessions, although they were not reminded about this fact at the beginning of Session 2. It might therefore appear that effects for VF with CP might be due to some

participants in the NVF group becoming more anxious because of anticipation that they would receive VF with CP in Session 2. If this were the case, (a) any putative effects for VF with CP would be as strong or stronger in regard to anxiety immediately before the intervention or (b) change in anxiety immediately before the intervention would account for any putative effects caused by the intervention. These hypotheses were tested and neither was found to be the case in these data (n = 21 due to one participant not completing the anxiety measure prior to intervention). Condition, self-observer discrepancy, and their interaction all failed to predict change in pre-intervention anxiety (part rs < .07, ps > .79), and the addition of change in pre-intervention anxiety to the regression predicting change in anticipatory anxiety showed no substantive changes, with the interaction term remaining statistically significant (p < .03). The effects found for anticipatory anxiety are therefore not due to NVF participants being more anxious about the intervention. These findings confirm our general impression that participants did not necessarily clearly recall, by the time of Session 2, under what conditions they would receive VF with CP.[4]

4. Discussion

This is the first controlled experiment to demonstrate any effects on anxiety in people with social anxiety disorder for the commonly-used intervention of VF with CP. VF with CP was associated with changes in self-perception of speech performance, particularly for those participants with higher self-observer discrepancies. This effect did not fully generalize to a second speech, although a moderate effect was found for VF with CP at that time point. A reduction in anxiety due to VF with CP was limited to anticipatory anxiety for those participants with higher self-observer discrepancy.

Most previous studies included analogue samples (Harvey et al., 2000; Kim et al., 2002; Parr & Cartwright-Hatton, 2009; Rapee & Hayman, 1996; Rodebaugh, 2004; Rodebaugh & Chambless, 2002). One of these studies (Parr & Cartwright-Hatton) demonstrated an effect for VF with CP on anticipatory anxiety; this was also the only previous study to assess anticipatory anxiety. The lack of effects in the other studies might therefore be due primarily to failure to assess anticipatory anxiety; our results suggest that the moderating effects of self-observer discrepancy might also limit the ability to detect an effect unless that moderating variable is measured and accounted for.

However, it must be noted that the findings provide only moderate support for the rationale that was originally developed for VF (Clark & Wells, 1995; Rapee & Hayman, 1996) and the addition of CP (Harvey et al., 2000). VF with CP was tested against exposure alone; thus, it is not possible to determine which of the many features of the intervention was responsible for the effect. This study has no ability to confirm whether one component alone might produce similar effects, or whether both VF and CP are needed. However, previous results suggest that both components would be needed (e.g., Harvey et al., 2000; Kim et al., 2002; Rodebaugh, 2004; Rodebaugh & Chambless, 2002). Finally, even those participants helped by VF with CP had their level of anticipatory anxiety reduced to the level of participants who had a somewhat more realistic impression of their performance but nevertheless had social anxiety disorder. It might be that VF with CP would increase willingness to engage in exposures, but not produce strong effects on overall disorder severity on its own.

[4]For the sake of brevity, we do not present the full results of further tests examining whether days between sessions or participant expectancy (measured by Borkovec and Nau's 1972 instrument) might explain the current results. In brief, there was no evidence that either of these factors explained or moderated the effects of the intervention. In particular, expectancy had no significant correlation with change on any outcome variable (all ps > .20). Because expectancy had no correlation with change, there is little reason to believe that expectancy could account for differences between conditions. Full results are available from the first author.

This study has limitations that must be taken into account. Most of these limitations are minor and appeared to have no effect on the results. For example, the design left the possibility that anxiety about the intervention, rather than anxiety about the speech, might have been the variable that was actually affected by the intervention. Our analyses provide no support for this alternative hypothesis, given that the variables that predicted change in anticipatory anxiety for the speech showed no tendency to predict change in anticipatory anxiety for the intervention. Nevertheless, an ideal version of this study would have left participants uncertain whether they would receive VF with CP in each session. Although participants were diagnosed using a reliable, structured clinical interview, full reliability for the entire sample was not available, and not all participants met with an independent assessor (because they did not return for this meeting). It is also reasonable to question whether the independent assessor would provide a completely independent assessment due to the nature of the study site alone. Thus, assessment might conceivably have been improved; yet we believe our methods yield strong certainty that our sample was diagnosed appropriately. An additional concern could be that our protocol would not allow clinicians the same freedom they would have in an actual therapy session to direct the focus of VF with CP to the client's particular concerns. Our protocol allowed some flexibility in this area, but this flexibility was limited to the items of the SPQ. This limitation appeared necessary to allow a controlled exploration of a standardized protocol. Similarly, discussing the videotape after feedback would likely be included by most therapists, but methodological considerations ruled out the use of this method. It remains possible that the intervention would have a stronger effect if it could be further individualized to the concerns of particular clients or included additional opportunities for the VF with CP recipient to process the video with the assistance of a clinician.

The primary limitation was that the sample size was relatively small. We believe that our sample size is adequate for testing whether VF with CP can be clinically useful. The intervention is technically difficult, requiring the availability of video recording and playback equipment; it is also time-consuming, often taking at least as long as an (additional) exposure plus a cognitive intervention (e.g., cognitive restructuring). Using the intervention requires significant time and effort for clinician and client. We therefore believe that VF with CP must show medium-large to large, robust effects to be worthy of clinical adoption. It seems unwise to obtain a small or small-to-medium sized effect on anxiety with VF with CP when another exposure would be technically easier, as well as less time-consuming, and would be expected to yield at least a medium-sized effect under most circumstances. Our small sample size limited the effects we could find to large and near-large effects, but our position is that the intervention must show effects of that size to be worth continued effort on the part of researchers and clinicians.

There was also a smaller, not statistically significant effect found here for the intervention: a medium-sized effect for the full sample in regard to anticipatory anxiety. However, it would have required a much larger sample (i.e., over 200 participants) to reliably detect this effect. It thus seems unlikely that even a much larger sample than our own would have detected this effect reliably, which may explain why such effects are so rarely reported in the literature. An alternative hypothesis is that our estimate of the effect is incorrect; we cannot rule this possibility out and must therefore leave this question to future studies. It should also be noted that we took pains to examine our data for excessive influence of individual cases, particularly in regard to the multiple regression results. We found no evidence of such overly influential cases.

The current results extend previous findings that the participants who are most likely to benefit from VF interventions are those who believe, erroneously, that they look the worst (Rodebaugh, 2004; Rodebaugh & Chambless, 2002; Rodebaugh & Rapee, 2005). The

moderating effects of self-observer discrepancy extended to anticipatory anxiety for a subsequent speech. As with self-observer discrepancy's effects on self-perception of performance, the effect on anxiety largely results in participants with higher self-observer discrepancy becoming more similar to those participants with lower discrepancy, even though the participants with lower self-observer discrepancy show similar levels of psychopathology. It thus seems unlikely that VF with CP would produce remission in social anxiety disorder, but as a component of standard treatment it appears to be useful for those participants who possess the most grossly distorted impressions of their performance. We also find it plausible that the combination of VF with CP with other interventions might be particularly effective. For example, in Clark's cognitive therapy (e.g., McManus et al., 2009), VF with CP is typically used in combination with experiments concerning safety behaviors and self-focus. It would be useful for future studies to determine whether the commonly-used components of therapy for social anxiety disorder produce interactive, rather than merely additive effects on symptoms.

Acknowledgments

This project was supported, in part, by grant number 1 R01 MH064481-01A1, "CBT Augmentation of Paroxetine for Social Anxiety," R. G. Heimberg, Principal Investigator, funded by the National Institute of Mental Health. Thomas L. Rodebaugh completed a portion of this study at Temple University.

We would like to thank Alison Cohn, Catherine Horky, Alison Kraus, Hee-Sang Lyu, and Michelle Wilson for assistance in research and/or editing, as well as Katya C. Fernandez, Julia Langer, Cheri A. Levinson, Erik A. Shumaker, and Tess Thompson for helpful reviews of previous drafts. Finally, Sheila R. Woody and four anonymous reviewers provided helpful feedback on a previous version of this manuscript.

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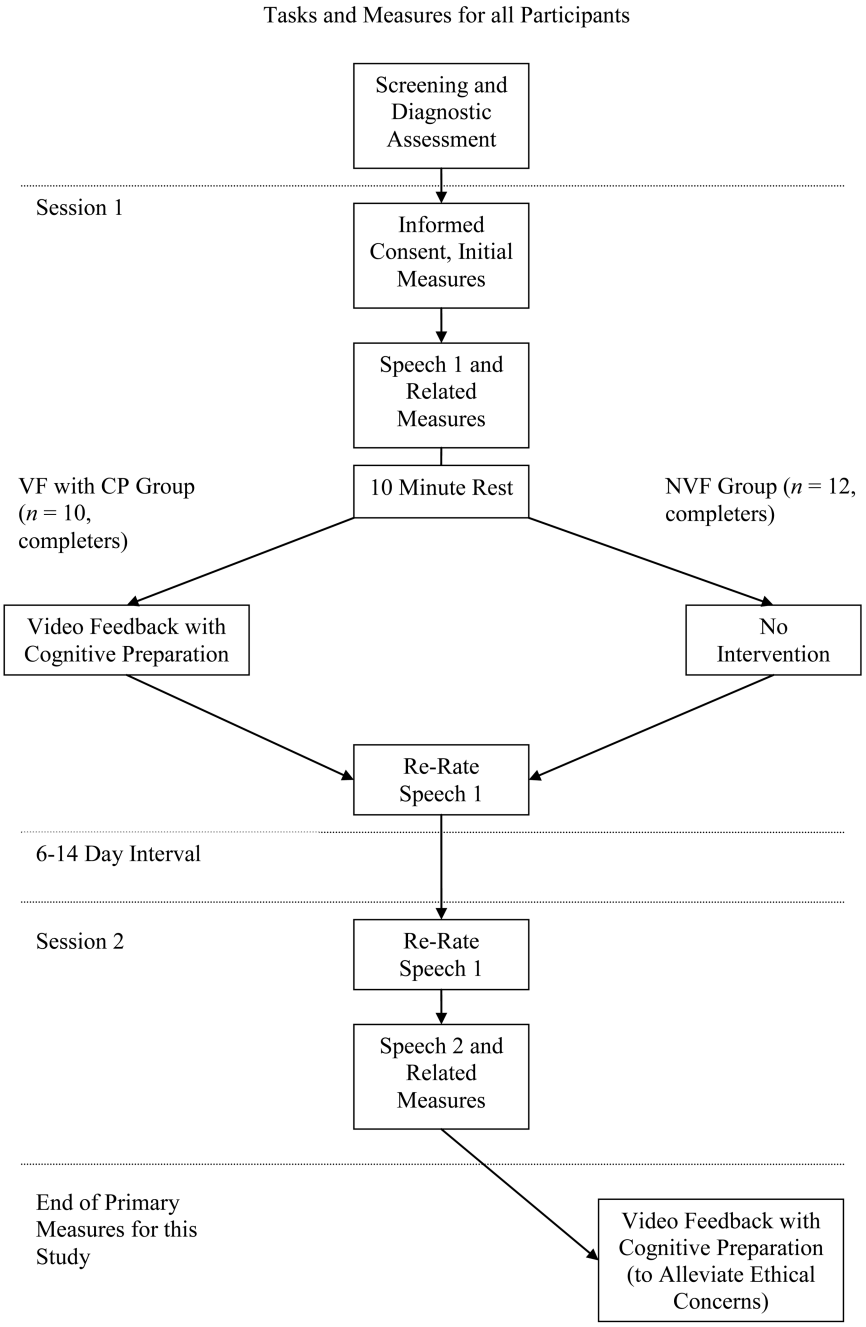

Figure 1.
Outline of Experimental Procedure.

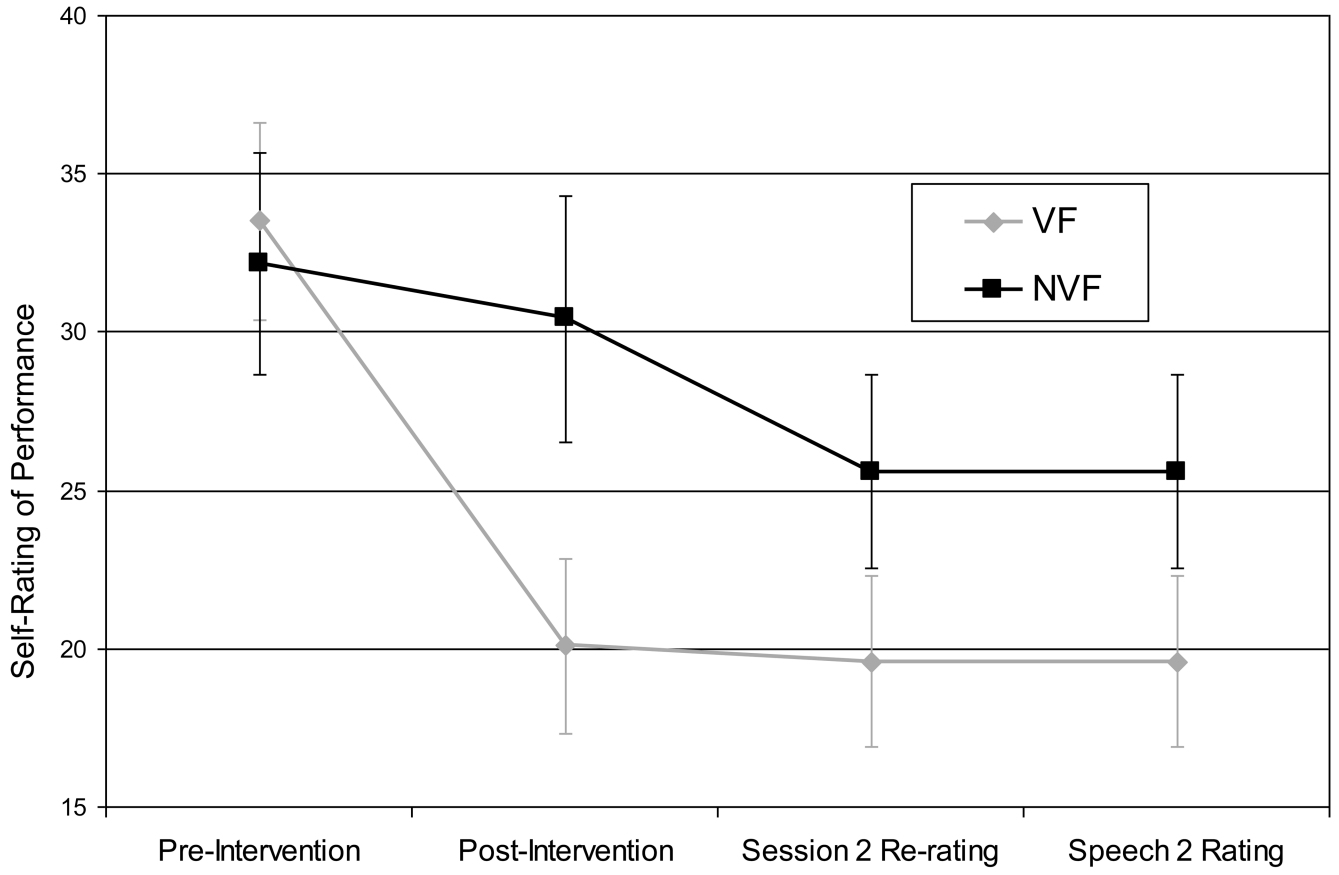

Figure 2.

Self-Rating of Performance Across Experiment. VF = Self-rating of performance for group of participants who received video feedback and cognitive preparation in Session 1. NVF = Self-rating of performance for group of participants who did not receive video feedback in Session 1; Pre-Intervention = Self-rating of Speech 1 performance prior to intervention phase; Post-Intervention = Self-rating of Speech 1 performance after the intervention phase; Session 2 Re-rating = Self-rating of Speech 1 at the beginning of Session 2; Speech 2 Rating = Self-rating of performance for Speech 2. Error bars show standard errors. Note that self-perception of performance is scored such that higher scores are worse (e.g., more nervous appearance).

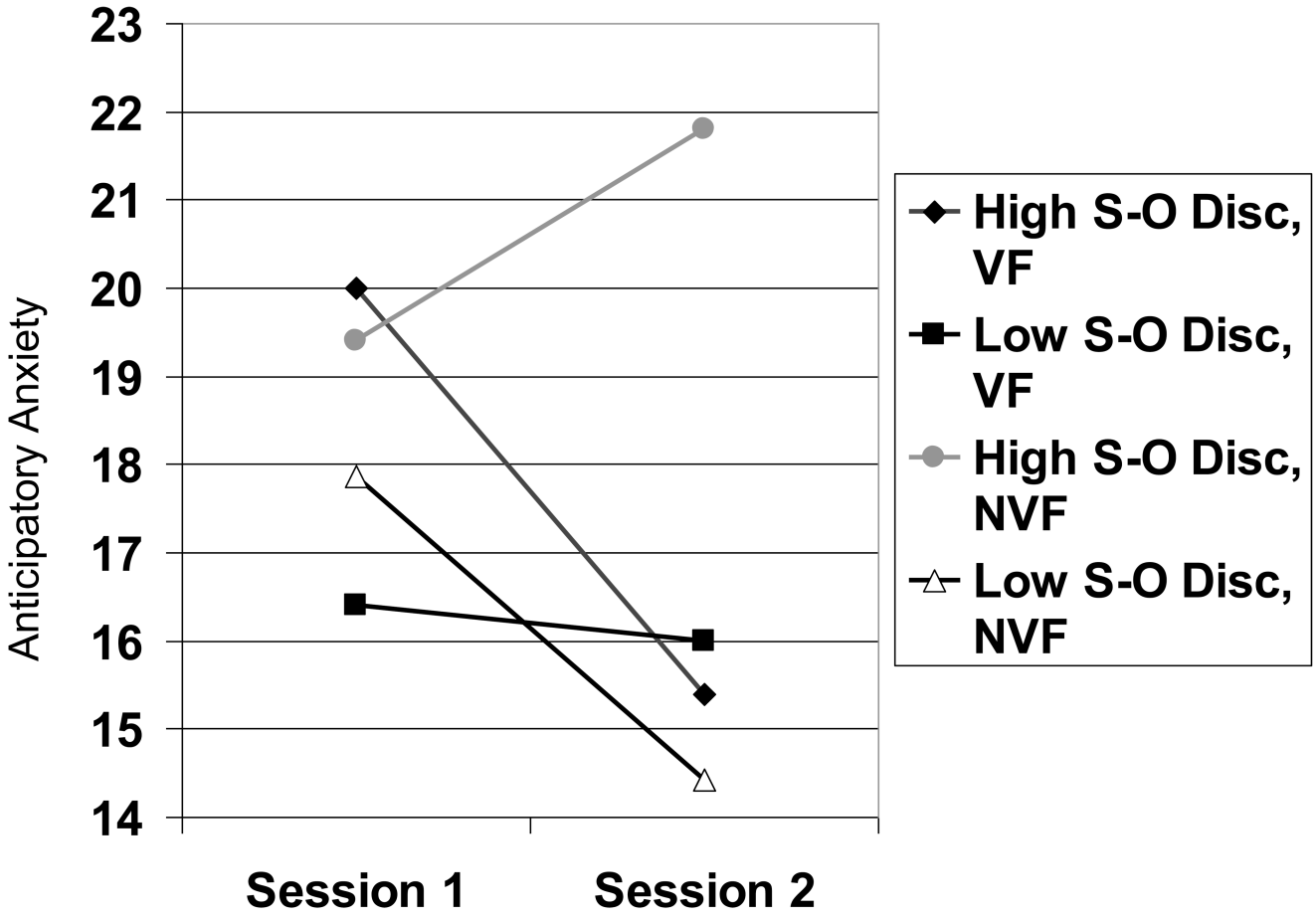

Figure 3.

Anticipatory Anxiety Across Sessions by Condition (Video Feedback with Cognitive Preparation or No Video Feedback in Session 1) and Self-Observer Discrepancy (Above or Below Zero). Note: S-O Disc = Self-Observer Discrepancy; VF = Video Feedback and cognitive preparation during Session 1; NVF = No Video Feedback during Session 1. Because the self-observer discrepancy variable is standardized, dividing the sample according to scores above or below 0 is equivalent to a mean split (or a median split without discarding the participant with the median value). Effects are displayed in this way because the number of participants available at one standard deviation above and below the mean would be very small for samples of $n < 13$ for each condition.