

Physical Appearance Anxiety Impedes the Therapeutic Effects of Video Feedback in High Socially Anxious Individuals

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Background: Video feedback (VF) interventions effectively reduce social anxiety symptoms and negative self-perception, particularly when they are preceded by cognitive preparation (CP) and followed by cognitive review. **Aims:** In the current study, we re-examined data from a study on the efficacy of a novel VF intervention for individuals high in social anxiety to test the hypothesis that physical appearance anxiety would moderate the effects of VF. **Method:** Data were analyzed from 68 socially anxious participants who performed an initial public speech, and were randomly assigned to an Elaborated VF condition (VF plus cognitive preparation and cognitive review), a Standard VF condition (VF plus cognitive preparation) or a No VF condition (exposure alone), and then performed a second speech. **Results:** As hypothesized, when appearance concerns were low, both participants who received Elaborated and Standard VF were significantly less anxious during speech 2 than those in the No VF condition. However, when levels of appearance concern were high, neither Elaborated nor Standard VF reduced anxiety levels during speech 2 beyond the No VF condition. **Conclusions:** Results from our analog sample suggest the importance of tailoring treatment protocols to accommodate the idiosyncratic concerns of socially anxious patients.

Keywords: Social anxiety, self-perception, video feedback, physical appearance, cognitive behavioral therapy.

Introduction

A progression of empirical research over several decades has investigated the factors underlying social anxiety (SA) and social anxiety disorder (SAD). Central to these efforts have been varying conceptualizations of the role of social skills in the persistence of SA symptoms. In the late 1970s, proponents of the skills deficits model (Trower, Bryant and Argyle, 1978) hypothesized that SA arises from deficits in one's repertoire of social behaviors and advocated for the use of social skills training (SST) in the treatment of SA (see Herbert et al., 2005; Wlazlo, Schroeder-Hartwig, Hand, Kaiser and Munchau, 1990). In support of this model, some studies have demonstrated that individuals high in SA show impairments in specific social skills relative to low SA individuals (e.g. Baker and Edelman, 2002; Fydric, Chambless, Perry, Buergener and Beazley, 1998); however, others have found that high SA individuals perform as adequately in social situations as non-anxious controls (Rapee and Lim, 1992; Strahan and Conger, 1998). Accordingly, proponents of cognitive models have

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argued that high SA individuals perceive their social abilities to be deficient and that it is these negatively distorted self-relevant beliefs that drive anxiety symptoms (Clark and Wells, 1995; Hofmann, 2007; Rapee and Heimberg, 1997). In support of this viewpoint, individuals with high SA and SAD tend to underestimate their social skills relative to objective observers and rate themselves more negatively than do low SA controls despite being comparable on behavioral measures of actual social abilities (e.g. Rapee and Lim, 1992; Segrin and Kinney, 1995). Even studies that have found high SA individuals to be objectively impaired on observer-rated measures of social performance have also demonstrated that such participants' self-ratings significantly underestimate their actual performance (Norton and Hope, 2001; Rapee and Abbott, 2006).

In contrast to SST interventions that target actual skills deficits, video feedback (VF) has been examined in a number of studies as a potential remedy for perceived skills deficits in high SA individuals and those with a clinical diagnosis of SAD. In VF, individuals are provided with a video playback of their behavior following a social task and are directed to correct underestimations of perceived performance. When used with cognitive preparation (Harvey, Clark, Ehlers and Rapee, 2000), VF significantly reduces negative self-ratings of social performance amongst both non-treatment seeking high SA individuals (Harvey et al., 2000; Kim, Lundh and Harvey, 2002; Rodebaugh, 2004) and treatment seeking patients with SAD (Rodebaugh, Heimberg, Schultz and Blackmore, 2010). Some recent research suggests that significant reductions in subjective anxiety levels might require that VF is both preceded by cognitive preparation and followed by an elaborative cognitive review (Parr and Cartwright-Hatton, 2009; Orr and Moscovitch, 2010), while at least one study has reported such reductions in anticipatory anxiety with VF plus cognitive preparation alone (Rodebaugh et al., 2010).

Video feedback has been successfully integrated into cognitive behavioral treatment (CBT) protocols for patients with SAD (e.g. Clark et al., 2003; Mortberg, Clark, Sundin and Aberg Wistedt, 2007) and is thought to be a vital component of therapy. As such, it is now important to identify individual difference variables that may moderate the efficacy of VF on treatment outcomes. Identifying such moderators may help us understand how to tailor specific CBT interventions for particular patients based on a priori knowledge about who is likely to benefit from them and who is not. Ultimately, this process may lead to improved CBT outcomes and reductions in the proportion of socially anxious patients (currently about 25%-50%) who remain significantly symptomatic following CBT (e.g. Davidson et al., 2004; Otto et al., 2000).

Rodebaugh and his colleagues have reported that the discrepancy between self and observer ratings of performance during public speaking significantly moderates the relation between VF and changes in self-perception amongst both non-treatment seeking high SA individuals (Rodebaugh and Chambless, 2002; Rodebaugh and Rapee, 2006) and treatment seeking individuals with SAD (Rodebaugh et al., 2010). That is, individuals with higher underestimations of performance showed greater changes in self-perception following VF than those with lower underestimates. Further, Rodebaugh et al. (2010) demonstrated that individuals with SAD who reported higher underestimations of performance showed greater reductions in ratings of state anxiety in anticipation of their speech relative to those with lower underestimations of performance. These results imply that VF is a particularly useful intervention for individuals with large baseline discrepancies between their perceived and actual level of performance – an important finding that may help clinicians tailor

their interventions according to pretreatment differences between patients in negative self-perception. Apart from these studies, however, we know little about other individual difference variables that may moderate the effects of VF on treatment outcomes.

On the basis of clinical observation, Moscovitch (2009) suggested that VF outcomes may be less efficacious for high SA individuals who are specifically worried about aspects of their appearance rather than their social skills per se. Moscovitch (2009) proposed that socially anxious samples are heterogeneous with respect to each individual's primary focus of anxiety about negative self-portrayal, with individual differences in self-portrayal concerns potentially occurring across four non-orthogonal dimensions: (a) social skills; (b) personality; (c) signs of anxiety; and (d) physical appearance. Notably, Moscovitch's (2009) hypothesized link between SA and perceived flaws in physical appearance was based on research showing that individuals with SAD underestimate their level of physical attractiveness during social performances relative to ratings from objective observers, rate themselves more negatively than non-clinical controls on measures of physical attractiveness (Rapee and Abbott, 2006), and are also more likely to endorse distorted body image (Izgiç, Akyüz, Dogan and Kugu, 2004). Further, individuals high in SA are significantly more likely than individuals low in SA to report that their appearance is inherently flawed and socially unacceptable (Hart et al., 2008). Moscovitch (2009) proposed that perceived flaws in physical appearance combined with anxiety about revealing such flaws to others may drive symptoms of SA for a subset of individuals.

Subsequent empirical tests of Moscovitch's (2009) model supported a three-factor solution in which concerns about signs of anxiety and physical appearance each loaded onto their own respective factor, while concerns about social skills and personality loaded onto a single factor that was labeled "concerns about social competence" (Moscovitch and Huyder, 2011). At present, standardized VF interventions are well-suited to address anxiety about social competence and signs of anxiety; indeed, socially anxious participants are asked during VF to pay attention to various observable indicators, including the quality of their voice and body language (social competence) as well as the extent to which they stutter, fidget, and sweat (signs of anxiety), and to consider the objective discrepancy between how they appear on video and how they thought or felt they appeared while they were interacting or performing (Harvey et al., 2000; Rodebaugh, 2004; Orr and Moscovitch, 2010). Through this process, VF promotes significant changes in self-perception as socially anxious individuals begin viewing themselves as being more socially competent and less visibly anxious than they initially thought or felt (Harvey et al., 2000; Rodebaugh, 2004; Orr and Moscovitch, 2010).

However, VF may be less than efficacious in targeting the third dimension of Moscovitch's (2009) model: perceived flaws in physical appearance. That is, clinical observation suggests that during VF, socially anxious patients who are particularly anxious about their physical appearance may become especially focused on their own perceived untoward physical characteristics and experience increased rather than decreased symptoms of anxiety upon exposure to their self-image. Therefore, it is reasonable to expect that one's anxiety about physical appearance may moderate the efficacy of VF on treatment outcomes such that individuals with high appearance anxiety may benefit to a lesser extent from VF. This hypothesis has not yet been tested empirically in the context of SA. However, research on body dysmorphic disorder (BDD) has demonstrated that when individuals with BDD look in the mirror, they focus their attention on specific parts of their appearance (as opposed to the whole) or on an internal impression or feeling rather than the objective reality of their

appearance (Mulken and Jansen, 2009), and that mirror-gazing in such a manner is associated with increased distress and self-focus (Veale and Riley, 2001). It is therefore possible that, like individuals with BDD who mirror-gaze, socially anxious individuals who are particularly high in appearance anxiety might respond to VF interventions with increased anxiety.¹

The present study sought to examine the extent to which physical appearance anxiety might moderate the relationship between VF and therapeutic outcomes amongst non-treatment seeking high SA individuals. In conjunction with this primary aim, we examined self-observer discrepancy as an additional moderator variable. To address our questions of moderation, we re-examined data that were collected as part of a prior experimental study on VF in which high SA participants completed two public speaking tasks in the laboratory (Orr and Moscovitch, 2010). The purpose of the initial study was to examine whether the standard VF protocol (which involved administering VF with cognitive preparation) could be optimized to facilitate reductions in self-reported SA by adding a post-VF cognitive review session (Elaborative VF). In Elaborative VF, participants were asked to compare discrepancies between their perception of their performance and their actual performance and answer elaborative questions about what they learned from VF. Results revealed that relative to the Standard and No VF conditions, only Elaborative VF was associated with reductions in performance anxiety from speech 1 to speech 2, and that Elaborative but not Standard VF led to significant improvements in self-perception and self-efficacy relative to exposure alone. Here we hypothesized that high appearance anxiety among participants who received VF (relative to exposure alone) would be associated with significantly less reduction in state performance anxiety from speech 1 to speech 2. We also hypothesized that greater self-observer discrepancies in participants' initial speech performances would predict greater reductions in state performance anxiety from speech 1 to speech 2.

Method

Participants

As described in Orr and Moscovitch (2010), 68 high SA individuals completed the study based on cut-off scores of 19 or higher on the Social Phobia Inventory (SPIN; Connor et al., 2000), and 59 or higher on the Personal Report of Communication Apprehension (PRCA-24; McCroskey, 1982). Consistent with Rodebaugh's (2004) approach, the PRCA-24 was used to ensure that participants were not only socially anxious but also specifically fearful of verbal communication (as per the experimental task). Upon arrival at the laboratory, participants were

¹Though both individuals with SAD and those with BDD may perceive that problematic aspects of their appearance would have negative consequences for social evaluation, BDD and SAD are currently considered distinct disorders. In cases where a differential diagnosis is difficult to make, it may be useful to consider diagnosing BDD if the singularity and strength of focus on negative physical attributes are particularly high. Indeed, BDD tends to be associated with distorted, strongly-held beliefs that are specific to concerns about appearance (Veale, Kinderman, Riley and Lambrou, 2003) whereas SAD is characterized by anxiety about perceived flaws in several interrelated areas, which may also include appearance (Moscovitch, 2009). Further, BDD tends to be primarily associated with self-directed feelings of disgust (Neziroglu, Hickey and McKay, 2010) whereas SAD tends to be associated with excessive feelings of embarrassment and/or shame (American Psychiatric Association, 1994; Lutwak and Ferrari, 1997). Despite these differences, the two conditions are highly comorbid, share a similar age of onset and developmental trajectory, and show comparable cognitive biases for interpreting social information (see Fang and Hofmann, 2010).

randomly assigned to either Elaborated VF ($n = 22$; “CP + VF + CR” in Orr and Moscovitch, 2010); Standard VF ($n = 21$; “CP + VF” in the original paper) or No VF ($n = 25$; “Exposure Alone” in the original paper).

Measures

As reported above, all participants completed the SPIN and the PRCA-24 for pre-selection purposes. All participants also completed the Beck Depression Inventory-II (BDI-II; Beck, Steer and Brown, 1996), which allowed us to examine whether participants randomized across conditions may have unexpectedly differed in levels of depression. In the current study, these measures demonstrated strong internal consistency scores (all α 's = .83 to .91). See Orr and Moscovitch (2010) for a detailed description of these measures and their psychometric properties.

Physical Appearance State and Trait Anxiety Scale: state version (PASTAS; Reed, Thompson, Brannick and Sacco, 1991). The PASTAS is a 16-item measure that assesses anxiety about physical appearance. Respondents rate the extent to which they feel anxious, tense, or nervous “right now” about parts of their face and body on a 5-point Likert scale ranging from 0 (not at all) to 5 (exceptionally so). A principal components analysis of the scale performed by Reed et al. (1991) revealed two components, which were labelled “weight” (e.g. thighs, buttocks) and “non-weight” attributes (e.g. ears, lips). The PASTAS has shown good test-retest reliability and internal consistency for each of the separate and combined subscales (Reed et al., 1991). In the current study, comparable results were found for analyses pertaining to each of the separate subscale scores and the total score; therefore only the full scale PASTAS score was included ($\alpha = .91$).

Subjective Units of Distress Scale (SUDS). After each of their two speeches, participants rated the anxiety they experienced during the speech at minutes one, two, and three (0–100). We computed the average of the three ratings for each speech, thus creating two composite SUDS scores ($\alpha = .83$ and $.89$).

Perception of Speech Performance (PSP; Rapee and Lim, 1992). The PSP (also referred to as the Speech Performance Questionnaire; Rapee and Abbott, 2007) is a 17-item measure used to calculate self-observer discrepancies. Following their first speech, participants rated their performance across the items from 0 (not at all) to 4 (very much). Two objective observers blind to the purpose and design of the study also later rated participants on the same indicators. Scores across the PSP items were summed separately for participants' and observers' ratings, with higher scores representing more negative perceptions. The interrater reliability for observer ratings (a two-way, mixed intraclass correlation coefficient for the consistency of the average measure) was .84, and total PSP scores of each observer were therefore averaged together to create one observer rating. Self-observer discrepancy was calculated in the manner described by Rodebaugh et al. (2010), in which participants' ratings of their first speech were regressed onto averaged observer ratings. The standardized residual of this analysis (i.e. the degree to which participants' ratings could not be predicted by observers' ratings) was used as a measure of self-observer discrepancy, with higher scores denoting greater self-observer discrepancies.

Procedure

Participants selected one of six controversial speech topics (e.g. the death penalty), prepared to give a 3-minute speech, and then delivered their speech in the laboratory in front of the experimenter and a video camera. They were informed that objective observers would later view and rate their speech performance. After their speech, participants estimated the level of anxiety they experienced at minutes one, two, and three. Participants randomly assigned to the Elaborated VF and the Standard VF conditions completed Cognitive Preparation (CP; Harvey et al., 2000) prior to VF, while those in the Elaborated VF condition also completed the post-VF Cognitive Review (CR). All participants then chose a different speech topic from the 6-item list and performed a second speech under the same conditions as the first. Following their second speech, they estimated their anxiety levels at minutes one, two, and three; see Orr and Moscovitch (2010) for complete details.

Results

Preliminary analyses

Participants did not differ across conditions in trait social anxiety (SPIN), $F(2, 65) = 2.18$, $p = .12$, partial $\eta^2 = .063$, communication anxiety (PRCA-24), $F(2, 65) = 1.84$, $p = .17$, partial $\eta^2 = .053$, depressive symptoms (BDI-II), $F(2, 66) = 1.06$, $p = .35$, partial $\eta^2 = .054$, or anxiety about physical appearance (PASTAS), $F(2, 65) = 1.13$, $p = .33$, partial $\eta^2 = .034$. Anxiety about physical appearance (on the PASTAS full scale) was positively correlated with trait social anxiety (SPIN), $r = .27$, $p = .024$. Participants' demographic information is available in Orr and Moscovitch (2010).

Moderation: anxiety about physical appearance. A hierarchical multiple regression analysis was conducted in SPSS 19.0 with average anxiety (SUDS) ratings during speech 2 regressed onto average SUDS ratings during speech 1 (as a covariate), the two dummy coded predictor variables (Elaborated VF and Standard VF, with No VF as the reference point), and anxiety about physical appearance (on the PASTAS full scale) as the moderator. The dummy coded interaction terms of Elaborated VF x anxiety about appearance and Standard VF x anxiety about appearance were entered in step 2.

As shown in Table 1, results revealed a significant omnibus ANOVA, $F(6, 61) = 10.95$, $p < .001$, $R^2 = .52$, with a main effect of condition. After controlling for average anxiety during speech 1, participants in the Elaborated VF condition reported significantly less anxiety during speech 2 ($M = 43.23$, $SD = 25.44$) than participants in the No VF condition ($M = 57.31$, $SD = 19.15$), $B = -13.66$, $p = .012$, $R^2 = .053$. Participants in the Standard VF condition also showed an advantage over No VF in reported anxiety during speech 2 ($M = 45.33$, $SD = 26.30$), but the effect only trended toward significance, $B = -9.48$, $p = .076$, $R^2 = .026$. There was no difference in anxiety during speech 2 between participants who received Elaborated VF and those who received Standard VF, $B = 4.18$, $p = .45$, $R^2 = .005$.

As predicted, the effects of each of the VF manipulations relative to no VF on SA were, in fact, dependent on participants' levels of concern about physical appearance (Elaborated VF x Anxiety about Appearance: $B = .92$, $p = .036$, $R^2 = .036$; Standard VF x Anxiety about Appearance: $B = 1.01$, $p = .024$, $R^2 = .042$). Results showed a significant change in R^2 following

Table 1. Summary of hierarchical regression analysis predicting anxiety during speech 2 with anxiety about appearance as moderator ($N = 68$)

Variable	<i>B</i>	<i>SE B</i>	β	<i>p</i>	ΔR^2
Step 1:					.43**
Anxiety during Speech 1	.62	.10	.57	<.001	
Elaborated VF	-13.66	5.29	-.27	.012	
Standard VF	-9.48	5.25	-.18	.076	
Anxiety about physical appearance	-.39	.32	-.20	.22	
Step 2:					.052*
Elaborated VF x Anxiety about appearance	.92	.43	.28	.036	
Standard VF x Anxiety about appearance	1.005	.44	.30	.024	

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

the addition of the two dummy coded interaction terms from Step 1 to Step 2 ($\Delta R^2 = .052$, $p = .044$). The interaction terms were probed using the method proposed by Aiken and West (1991) and described by Holmbeck (2002). As shown in Figure 1, the Elaborated and the Standard VF showed a clear advantage over No VF in social anxiety reduction at low levels of concern about physical appearance (1 *SD* below the mean), ($B = -25.18$, $p = .002$, $R^2 = .084$ and $B = -22.01$, $p = .003$, $R^2 = .077$, respectively); moreover, there was no difference in anxiety reduction during speech 2 for participants who received Elaborated VF and those who received Standard VF ($B = 3.17$, $p = .69$, $R^2 = .001$). At high levels of concern about physical appearance (1 *SD* above the mean), VF (both Elaborated and Standard) showed no advantage over No VF in SA reduction; that is, there were no differences between any of the conditions in levels of reported anxiety during speech 2 at high levels of physical appearance concern (Elaborated VF vs. No VF: $B = -2.14$, $p = .77$, $R^2 = .001$; Standard VF vs. No VF: $B = 3.05$, $p = .71$, $R^2 = .001$; Elaborated VF vs. Standard VF: $B = 5.19$, $p = .48$, $R^2 = .004$). Differences in Figure 1 between the three conditions at low levels of concern about appearance appear to be due, in part, to an apparent heightening of anxiety from high to low appearance concerns amongst the No VF group. However, an examination of the within-condition simple slopes from high to low appearance concerns demonstrated that the slope for the No VF condition was non-significant, $B = -.39$, $p = .22$, $R^2 = .012$. The slope for the Standard VF condition from low to high appearance concerns was significant, $B = .62$, $p = .047$, $R^2 = .033$, while the slope for the Elaborated VF condition from low to high concerns about appearance trended toward significance, $B = .54$, $p = .087$, $R^2 = .024$.

Moderation: self-observer discrepancy. The hierarchical multiple regression analysis described above was repeated with self-observer discrepancy rather than appearance concerns entered as the moderator variable.² As displayed in Table 2, results revealed a significant omnibus ANOVA, $F(6, 61) = 10.61$, $p < .001$, $R^2 = .46$. However, the change in R^2 following the addition of the two dummy coded interaction terms from Step 1 to Step 2 was non-significant ($\Delta R^2 = .029$, $p = .17$), as were the effects of the two interaction

²Combining the two moderators into one analysis led to a significant reduction in power which, in turn, reduced the relative strength of our effects, making them more difficult to interpret. Thus, for the sake of enhanced power and increased clarity, we opted to analyze the two hypothesized moderators in separate analyses.

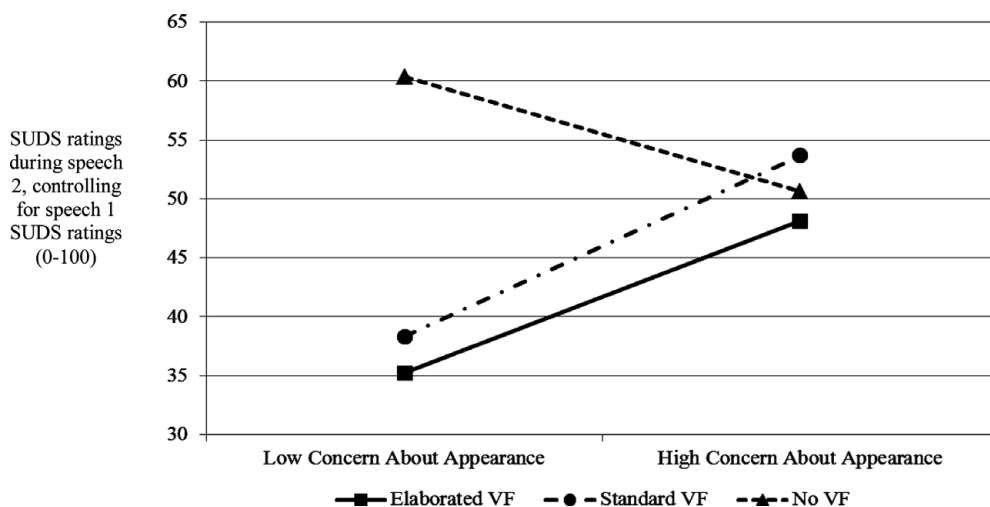


Figure 1. The moderating effect of anxiety about physical appearance on self-reported anxiety (SUDS) ratings during speech 2 (controlling for speech 1 SUDS ratings).

terms on self-reported anxiety, $B_{\text{Elaborated VF} \times \text{self-observer discrepancy}} = 9.53$, $p = .080$, $R^2 = .025$; $B_{\text{Standard VF} \times \text{self-observer discrepancy}} = 8.15$, $p = .15$, $R^2 = .017$. A post-hoc power analysis using the statistical program *G-power* demonstrated that there was relatively low power (.18) to detect the relatively small change in R^2 following the addition of the two dummy coded interaction variables. It is therefore plausible that significant moderation with the self-observer discrepancy variable may have occurred with a larger sample size.³

Discussion

The effect of VF on reductions in SA was dependent on the extent to which socially anxious participants were anxious about their physical appearance. When anxiety about physical appearance was low, participants who received either Elaborated or Standard VF reported significantly less anxiety following the intervention than those in the No VF condition. However, for those with high anxiety about physical appearance, neither Elaborated nor Standard VF led to significant reductions in SA above and beyond exposure

³Given that the moderating effect of self-observer discrepancy was non-significant, we were hesitant to probe the interaction terms further through post hoc tests. However, for the sake of comparing the current study's results with those from the literature (e.g. Rodebaugh et al., 2010), we have provided the following post hoc results: the Elaborated and the Standard VF conditions showed a clear advantage over No VF in social anxiety reduction for individuals with low self-observer discrepancies ($B = -24.77$, $p = .002$, $R^2 = .085$ and $B = -19.96$, $p = .010$, $R^2 = .057$, respectively); moreover, there was no difference in anxiety reduction during speech 2 for participants who received Elaborated VF and those who received Standard VF ($B = 4.81$, $p = .57$, $R^2 = .003$). For participants with high self-observer discrepancies, VF (both Elaborated and Standard) showed no advantage over No VF in SA reduction; that is, there were no differences between any of the conditions in levels of reported anxiety during speech 2 for individuals with high self-observer discrepancies (Elaborated VF vs. No VF: $B = -5.51$, $p = .48$, $R^2 = .004$; Standard VF vs. No VF: $B = 3.65$, $p = .65$, $R^2 = .002$; Elaborated VF vs. Standard VF: $B = 1.86$, $p = .79$, $R^2 = .001$).

Table 2. Summary of hierarchical regression analysis predicting anxiety during speech 2 with self-observer discrepancy as moderator ($N=68$)

Variable	<i>B</i>	<i>SE B</i>	β	<i>p</i>	ΔR^2
Step 1:					.45**
Anxiety during speech 1	.53	.12	.49	<.001	
Elaborated VF	-15.14	5.47	-.30	.008	
Standard VF	-11.80	5.44	-.23	.034	
Self-observer discrepancy	-.32	3.98	-.013	.94	
Step 2:					.029
Elaborated VF x Self-observer discrepancy	9.63	5.41	.23	.08	
Standard VF x Self-observer discrepancy	8.15	5.62	.18	.15	

** $p < .01$.

alone without VF. Within-condition differences in state anxiety during speech 2 among participants who received VF demonstrated that those whose anxiety about appearance was low experienced greater anxiety reduction than those whose appearance anxiety was high.

These findings provide tentative support for recent claims that idiosyncratic self-attribute concerns may represent an important moderator of treatment outcomes in SA (Moscovitch, 2009). Indeed, VF protocols in their current format may not be efficacious for socially anxious patients high in appearance anxiety. Because current VF protocols for SA are designed to target concerns about social competence and signs of anxiety, they may serve as a distraction and therefore fail to help patients who possess unique core negative self-representations pertaining specifically to physical appearance concerns. Modifications to VF that help individuals pay attention to corrective information about specific threat stimuli are likely to facilitate changes in the content of existing self-schemas (Foa and McNally, 1996; Brewin, 2006). With supporting evidence from future studies, it might therefore be fruitful to consider employing VF interventions typically used in the treatment of BDD (Neziroglu, McKay, Todaro and Yaryura-Tobias, 1996; Phillips, 2005) to augment the treatment of individuals with SAD who are identified as having high levels of anxiety or concern about their physical appearance. This might include helping patients operationalize their specific appearance concerns prior to VF and then using VF to direct patients to pay specific attention to and correct discrepancies between their predictions about how their physical features will appear in the video and how they actually appear when viewed more objectively (Veale and Neziroglu, 2010).

Further, unlike Rodebaugh et al. (2010) who found that individuals with SA with higher self-observer discrepancies demonstrated significantly greater reductions in anticipatory state SA than individuals with lower self-observer discrepancies, we found that self-observer discrepancy was not a significant moderator of the efficacy of VF on self-reported SA. However, the observed power for detecting the moderation effect was low – likely a result of both the small effect size of the interaction between VF and self-observer discrepancy and the limited sample size of the current study. Aside from low power, the null findings with respect to moderation may also have been due to differences between the current study and Rodebaugh et al.'s (2010) study in the time-points at which state anxiety was measured. That is, the current study assessed SA during participants' speeches while Rodebaugh et al. (2010)

measured participants' SA both in anticipation and after participants' speeches. More research is needed to examine the moderating effects of self-observer discrepancy on self-reported SA in both clinical and analog samples and at various time points following administration of VF. In this manner, it is possible that participants' concerns about physical appearance might also moderate the effect of VF on self-reported SA differently on the times at which SA is measured.

The present study was limited in a number of ways, including its use of post-hoc analyses, its relatively small sample size, and its focus on a convenient analog sample of non-treatment seeking participants. Further, although the PASTAS was useful for assessing state anxiety about physical appearance, it did not address the specific nature of participants' concerns about their appearance. For example, for participants who endorsed exceptional anxiety about their face, we were unable to determine the specific reasons for this anxiety and the idiosyncratic nature of their concern. In this respect, it is possible that certain PASTAS items may have actually measured participants' worries about revealing visible signs of anxiety rather than worries about their physical appearance per se. Indeed, Moscovitch (2009) acknowledged that there is often substantial overlap between the dimensions of physical appearance and signs of anxiety in individuals with SAD. It was also unclear to what extent the PASTAS captured variance in actual concerns participants may have had about their own physical attributes (e.g. "I hate my legs") versus anxiety about having such attributes evaluated negatively by others ("What if he/she criticizes my legs?"). Future research on VF could explicitly identify participants according to their primary self-related concerns (e.g. physical appearance, signs of anxiety, social competence, or a combination thereof) and in so doing, help to determine how to tailor VF protocols to target individuals' symptoms most effectively. To this end, the Negative Self-Portrayal Scale (Moscovitch and Huyder, 2011) may be used by researchers and clinicians to assess individuals' explicit a priori concerns across these specific dimensions.

In conclusion, the present study is one of only a few to examine the moderating effects of individual differences on VF outcomes in SA, and the first to demonstrate that anxiety about physical appearance moderates the therapeutic benefits of VF. As clinical researchers continue to emphasize the need for an idiographic approach to CBT case formulation and treatment (e.g. Kuyken, Padesky and Dudley, 2009), future experimental research on moderators of established CBT interventions will ultimately enable clinicians to tailor therapy to accommodate the specific presenting concerns and needs of individual patients.

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