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Differential Effect of Mirror Manipulation on Self-Perception in Social Phobia Subtypes

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Abstract

This study employed mirror manipulation to examine differences in self-perception between the DSM-IV subtypes of social phobia (social anxiety disorder). We asked 82 consecutively admitted patients with social phobia to record three positive and three negative characteristics about themselves. Sixty-three percent of them met criteria for a generalized subtype of social phobia (GSP). A random half of the total sample sat in front of a mirror before and during this task. Participants' responses were classified into either positive or negative self-statements concerning their bodily appearance, competence, and socially relevant or non-socially relevant personality characteristics. The mirror manipulation had a differential effect on self-perception in social phobia subtypes. The presence of a mirror led to more positive and negative self-statements about bodily appearance, and to fewer negative self-statements about socially-relevant personality characteristics in participants with GSP. In contrast, participants not meeting criteria for GSP responded to mirror exposure only with fewer negative self-statements about non-socially relevant personality characteristics. These results suggest that mirror exposure leads to fewer negative self-statements about private aspects of the self, concerning social situations, while it enhances public self-consciousness in individuals with GSP.

Keywords

Social phobia; social phobia subtypes; self-focused attention; self-perception; self-evaluation; self-description

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Self-related processes occupy an important role in many contemporary models of social phobia (Alden, Mellings, & Ryder, 2001; Clark & Wells, 1995; Leary, 2001; Rapee & Heimberg, 1997). According to these models, individuals with social phobia assume that other people are inherently critical and likely to evaluate them negatively in social situations. Consistent with this notion are the results from treatment outcome studies suggesting that effective psychotherapy leads to a modification of self-perception (Hofmann, 2000; Woody, Chambless, & Glass, 1997; Wells & Papageorgiou, 1998).

However, there is considerable heterogeneity among individuals with social phobia, and current models of social phobia have not been able to sufficiently address these inter-individual differences. The DSM-IV criteria include a subtype specifier to account for some of this heterogeneity. Accordingly, clinicians are instructed to assign a “generalized subtype” of social

phobia (GSP) if the individual fears “most social situations.” Individuals not meeting criteria for GSP are often classified into the “nongeneralized subtype” category.

Previous studies showed that GSP is associated with a high level of social anxiety, poor overall psychosocial functioning, greater overall psychopathology, high trait anxiety, and depression (e.g., Boone, McNeil, Masia, Turk, Carter, Ries, & Lewin, 1999; Brown et al., 1995; Herbert et al., 1992; Holt et al., 1992; Tran & Chambless, 1995; Turner et al., 1992). Individuals with GSP further report an earlier age of onset (Brown et al., 1995; Mannuzza et al., 1995; Stemberger et al., 1995), show more cognitive interferences (Hofmann, Gerlach, Wender, & Roth, 1997; McNeil et al., 1995), and less psychophysiological reactivity during exposure to social threat (Boone et al., 1999; Heimberg, Hope, Dodge, & Becker, 1990; Hofmann, Newman, Ehlers, & Roth, 1995; Levin et al., 1993) than individuals with nongeneralized social phobia.

Similarly personality psychologists have observed a considerable degree of heterogeneity among shy individuals. Specifically, Buss (1986) distinguished between a “self-conscious” and a “fearful” subtype of shyness. The self-conscious subtype has been characterized by excessive self-awareness of public aspects of one’s self, whereas the characteristic feature of the fearful type is autonomic reactivity. Based on Buss’ (1986) model, Hofmann and Barlow (2002) distinguished between a fearful and an anxious/self-conscious subtype of social phobia and hypothesized that relatively more individuals with nongeneralized social phobia are fearful, and relatively more individuals with GSP are anxious/self-conscious.

The “self” is difficult to study. Experimental and social psychologists conceptualize the self as a multidimensional construct consisting of global and domain-specific self-evaluations (Hattie & Marsh, 1996), which are represented as hierarchical (Kihlstrom & Cantor, 1984) and dynamic schemas and memory structures (Markus & Wurf, 1987). Harter (1999) emphasized the importance of distinguishing self-description from self-evaluation when studying self-perception. Self-evaluations are judgments that typically refer to competence and personal or social adequacy (Harter, 1999). Such self-statements can either relate to private characteristics of a person (which are related to private self-consciousness), or to public aspects of the self (which are related to public self-consciousness). For example, self-statements about personal competence or personality aspects may reflect the private aspect of self-consciousness, whereas statements about one’s bodily appearance are associated with public self-consciousness (e.g., Fenigstein, Scheier, & Buss, 1975). It has been suggested that the perceptions of the opinions of others toward the self are important determinants of self-perception (Cooley, 1902; Leary, Haupt, Strausser, & Chokel, 1998; Mead, 1925), and that individuals base their self-worth partly on their social roles and relationships with other people (Markus & Kitayama, 1991). Thus, self-perception includes, at a minimum, judgments about one’s competence, bodily appearance, and personality characteristics that can be either socially relevant or non-socially relevant.

Conventional assessment techniques that focus on self-evaluation have primarily employed self-report measures that require individuals to indicate whether they view themselves positively or negatively in various domains of self-perception (e.g., Carver & Scheier, 1978; Fenigstein et al., 1975; Scheier & Carver, 1985). Methodologies that focus on self-description ask respondents to define themselves to the question “Who am I?” (Gorden, 1968; Harter, 1999; McGuire & McGuire, 1980; Rentsch & Heffner, 1992). This technique lends itself to a content analysis of spontaneously generated self-statements that are coded into a number of different categories to provide a portrait of the dimensions that are most salient to the individual’s self-representation. However, the reliability and validity of this procedure is questionable (Rentsch & Heffner, 1992). Furthermore, the distinction between self-evaluation and self-description is often blurry and arbitrary when using this assessment technique. For

example, it has been shown that individuals typically organize concepts, whether about themselves or others, in terms of judgments that are either positive or negative (Osgood, Suci, & Tannenbaum, 1971). In addition, self-perception can vary from situation to situation (Leary et al., 1998), although self-esteem, self-consciousness, and related constructs are typically conceptualized as dispositional (trait) variables (Fenigstein, 1997; Harter, 1999).

Previous experiments on self-perception have used the presence of a mirror to manipulate self-focused attention (Buss & Scheier, 1976; Carver, 1976; Carver & Scheier, 1978; Duval & Wicklund, 1972, 1973; Scheier, Carver, & Gibbons, 1979; Wicklund & Duval, 1971). In a recent experiment, we have employed mirror manipulation in combination with a forced-choice self-statement technique to investigate the differential effect of heightened self-focused attention on self-perception and self-evaluation in a group of undergraduate students (Hofmann & Heinrichs, 2002). In this study, we asked participants to write down three positive and three negative aspects about themselves. Before completing this task, half of the subjects sat in front of a large mirror for five minutes. The participants' self-statements were classified by two independent and blind raters into one of the following categories: (1) bodily appearance; (2) competence; (3) socially relevant personality characteristics (e.g., "I am competitive" or "I am a good friend"); (4) non-socially relevant personality characteristics (e.g., "I am a procrastinator" or "I am creative"); and (5) "other" (for statements that did not fit into any of the other categories). The results suggested that the presence of a mirror has a moderating effect on self-evaluation, and leads to more statements about public aspects and to less self-critical statements about private aspects of the self. These findings have encouraged us to employ the same technique to study self-perception in social phobia and its subtypes.

We predicted that GSP is similar to the self-conscious subtype of Buss (1986) classification system. Because the presence of a mirror raises the level of self-focused attention (Fenigstein, 1997; Fenigstein et al., 1975; Hofmann & Heinrichs, 2002; Thornton, & Moore, 1993), we expected that GSP is associated with more self-criticism and greater self-awareness, especially about public aspects of the self, than the nongeneralized subtype.

Method

Participants

Eighty-two outpatients who presented at the Center for Anxiety and Related Disorders at Boston University with a principal DSM-IV diagnosis of social phobia participated in this study. All individuals were either self-referred or referred by a clinician for social phobia from the Boston area. On the average, participants were 31 years old (range: 19-67; *SD*: 9.1). The majority were Caucasian (84.1%) and male (56.1%). Over half of them were single (61%), and 24% were married. Furthermore, more than half (63.4%) of the participants met the DSM-IV criteria for the "generalized" subtype of social phobia. The rest of the patients were assigned to a "nongeneralized" subtype category.

The social phobia subtype was determined on the basis of the patient's subjective anxiety ratings on the 24 social situations from the Liebowitz Social Anxiety Scale (LSAS, Liebowitz, 1987). In an attempt to examine the prevalence and overlap of social anxiety across different classes of situations, Holt, Heimberg, Hope, and Liebowitz (1992) classified the items of the LSAS into four different domains - formal speaking/interaction, informal speaking/interaction, assertive interaction, and observation by others. Patients of the present study were classified into the "generalized subtype" if they rated one or more social situations from each domain as at least moderately fear provoking (rating of 2 or greater on a 0 - 3 point scale). Otherwise, patients were classified as "nongeneralized." Previous studies indicate that a similar procedure can reliably distinguish individuals with high and low social anxiety and other psychopathology (Hofmann, et al., 1999; Hofmann & DiBartolo, 2000; Hofmann & Roth, 1996).

Among individuals who did not meet criteria for the generalized subtype, 23 participants (26.8%) met the threshold on three domains, 5 participants (6.1%) met the threshold on two domains, and only three individuals (3.7%) met the threshold on only one domain. This suggests that the “specific” or “circumscribed” subtype of phobic individuals was uncommon in the present sample.

DSM-IV diagnoses were assessed with the lifetime version of the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV-L; DiNardo, Brown, & Barlow, 1994). This interview shows high inter-rater reliability of diagnosing social phobia ($Kappa = .77$; Brown, DiNardo, Lehman, & Campbell, 2001). This kappa coefficient was based on 80 patients with a principal diagnosis of social phobia. Ten randomly selected subjects of the present study were also part of the reliability study by Brown et al. (8 of them received mirror exposure and 7 met criteria for GSP). These individuals received the same interview assessment twice by two independent interviewers using the same instrument. In most cases (79%), the second interview occurred within 2 weeks of the first interview. After both interviews had been completed, cases were presented in weekly meetings with senior clinicians in order to establish consensus diagnoses. The five most common co-morbid diagnoses included major depression (21.8%), generalized anxiety disorder (12.9%), dysthymia (10.0%), specific phobia (7.6%), and depressive disorder not otherwise specified (6.5%). For unknown reasons, the comorbidity rate in this sample was relatively low as compared to other published studies.

All subjects were randomly assigned to the two experimental conditions (with vs. without mirror exposure). The two groups did not differ on any diagnostic or demographic variables (all p s $> .3$). The determination whether or not subjects met criteria for GSP was made based on the results of the LSAS after the experimental manipulation. Therefore, the diagnostic subtype status was unknown at the time of the experimental manipulation.

Procedure

After participants arrived at the laboratory, informed consent was obtained. All individuals were part of a treatment outcome study, the results of which will be reported elsewhere. As part of a pre-treatment assessment, half of the participants were asked to sit in front of a mirror for 5 minutes with no further instructions. The mirror was 1.44 meters long and 40 cm wide and was placed approximately 2 meters in front of the person. After the 5 minutes were over, participants were given a sheet of paper with the written instructions to record 3 positive and 3 negative characteristics to describe themselves (the mirror was still present during this task). The other half of the participants were given the same instructions without the presence of a mirror.

All subjects were further asked to complete the Social Phobia and Anxiety Inventory (SPAI; Turner, Beidel, Dancu, & Stanley, 1989), a widely used and psychometrically sound self-report instrument to measure the severity of social anxiety, in order to ensure equality between groups in the level of social anxiety. A comparison of the SPAI social subscale scores between individuals with (M : 132.0; SD : 30.1) and without mirror exposure (M : 130.7; SD : 30.2) suggested that both groups were similar in the level of social anxiety ($p > .8$). As expected, participants with GSP showed a higher score on the social phobia subscale of the SPAI, (M : 141.6; SD : 22.7) than individuals with a nongeneralized subtype (M : 113; SD : 32.9; $p < .0001$).

Classification of Self-Statements

Each participant was instructed to name 3 positive and 3 negative self-statements. Each of these statements were classified by two independent raters into one of 10 categories (5 positive and 5 negative categories). A self-statement could not be classified into more than one category.

The two raters showed high inter-rater agreement (Cohen's Kappa: .88). Disagreements were resolved through consensus ratings.

Participants reported a total of 492 self-statements (82 individuals reported 3 positive statements and 3 negative statements about themselves). Two independent and blind raters classified each statement into one of the following categories (an example is given with each category): (1) bodily appearance (positive: "I have nice hair," negative: "I am short"); (2) competence (positive: "I am intelligent," negative: "I am not very bright"); (3) socially relevant personality characteristics (positive: "I am a nice person," negative: "I am selfish"); (4) non-socially relevant personality characteristics (positive: "I am ambitious," negative: "I am lazy"); and (5) "other" (positive and negative statements that did not fit into any other category). In order to distinguish socially relevant personality characteristics and non-socially relevant personality characteristics, the raters were instructed to imagine whether the person could exhibit the personality characteristic if he/she was living alone on an island (e.g., on a deserted island, one can be lazy but not selfish).

Depending on the number of self-statements per category, subjects received a value between 0 and 3 for each of the 5 positive and 5 negative self-statement categories. The data matrix for the analysis therefore consisted of 82 subjects and 10 dependent variables per subject (5 negative and 5 positive self-statement categories) with values of each dependent variable ranging from 0 to 3.

Results

Multivariate Tests

In order to determine whether the presence of a mirror had an effect on self-perception in individuals with generalized and non-generalized social phobia, we conducted a multivariate test employing the general linear model approach for multivariate comparisons (SPSS, release 9.0.0). The analysis included the 10 dependent variables (the self-statement categories) and two between-subjects factors: (1) the presence vs. absence of a mirror and (2) the generalized vs. nongeneralized subtype of social phobia. There was no within-subject factor. A power analysis (Faul & Erdfelder, 1992) indicated that the power of this test was sufficient (.85) for detecting a medium to large-sized effect ($f^2 = .25$) at $p < .05$.

Normality was examined by visual inspection and by calculating the ratio of skewness and kurtosis to their respective standard errors (normality can be rejected if this ratio is less than -2 or greater than +2). The ratio values were similar in the experimental groups. The positive and negative self-statements about socially-relevant and non-socially relevant personality characteristics were normally distributed in the two samples. However, positive and negative self-statements about bodily appearance, competence, and other aspects were not normally distributed. Furthermore, the data collection procedure may have violated the assumption of independence for the MANOVA procedure because, once the six thoughts were assigned to one of the 10 categories, the remaining four categories were necessarily zero. Therefore, we conducted a series of nonparametric Mann-Whitney U-tests in addition to the MANOVA.

The results of the MANOVA test showed a significant interaction between subtype and mirror exposure, $F(10, 67) = 2.11, p < .04$, and a trend for the main effect of the mirror condition, $F(10, 67) = 1.94, p < .055$. The main effect of the social phobia subtype was not significant, $F(10, 67) = 1.18, p > .3$. The same pattern of results was also found when gender was included as a covariate in this model. The results showed again a significant interaction between subtype and mirror exposure, $F(10, 65) = 2.04, p < .05$, and again a trend for the effect of mirror exposure, $F(10, 65) = 1.83, p < .072$. The main effects of social phobia subtype remained non-significant, $F(10, 65) = 1.1, p > .3$.

Univariate follow-up analyses (ANOVAs) showed that individuals with GSP reported fewer negative self-statements about socially relevant personality characteristics when exposed to a mirror ($p < .004$). In addition, mirror exposure was associated with more positive ($p < .03$) and negative statements ($p < .02$) about bodily appearance in this subgroup. In contrast, individuals with nongeneralized social phobia responded to the presence of a mirror with only fewer negative self-statements about non-socially relevant personality characteristics, $p < .001$.

Nonparametric Tests

Consistent with the results of the MANOVA and MANCOVA analyses, Mann-Whitney U-tests suggest that the presence of a mirror had a differential effect on self-perception in the two social phobia subtypes. As shown in Table 1, individuals with GSP who were exposed to a mirror reported fewer negative self-statements about socially relevant personality characteristics than individuals with GSP who did not sit in front of a mirror ($p < .005$). In addition, they reported more positive ($p < .05$) and negative self-statements ($p < .01$) about their bodily appearance as a result of the mirror exposure. In contrast, participants with nongeneralized social phobia (Table 2) only reported fewer negative self-statements about non-socially relevant personality characteristics when they sat in front of a mirror compared to those who did not sit in front of a mirror ($p < .005$).

Discussion

The goal of this study was to investigate the effects of mirror manipulation on self-perception in social phobia subtypes. For this purpose, we asked 82 individuals with social phobia to record three positive and three negative characteristics to describe themselves. Half of the participants were asked to sit in front of a mirror before and during this task, whereas the other half received no mirror exposure. Each statement was classified as either a positive or negative self-description concerning bodily appearance, competence, or a personality characteristic that is either socially relevant or non-socially relevant. This classification system was theoretically derived (Cooley, 1902; Leary et al., 1998; Markus & Kitayama, 1991; Mead, 1925) and showed good reliability as indicated by high agreement between two independent and blind judges.

Mirror exposure led to more positive and negative self-statements about bodily appearance in participants with GSP, but not in individuals with nongeneralized social phobia. This finding is in line with the notion that mirror exposure enhances public self-awareness (Fenigstein, 1997; Fenigstein et al., 1975; Thornton, & Moore, 1993), but only in individuals with GSP. This result is consistent with our hypothesis that the presence of a mirror only raises public self-awareness in individuals with GSP, who are assumed to be similar to Buss' (1986) "self-conscious" subtype of shyness.

The results further showed that the presence of a mirror led to fewer negative self-statements regarding socially-relevant personality characteristics in individuals with GSP. In contrast, individuals with nongeneralized social phobia responded to the presence of a mirror with fewer negative self-statements about non-socially relevant personality characteristics. In this respect, participants with nongeneralized social phobia responded to the mirror manipulation much like non-anxious undergraduate students (Hofmann & Heinrichs, 2002). For both groups (normals and nongeneralized social phobic individuals), the presence of a mirror seems to have a moderating effect on negative non-socially relevant personality characteristics. In contrast, individuals with GSP responded to the presence of a mirror primarily with fewer negative self-statements about socially relevant personality characteristics. These findings suggest that the presence of a mirror forces individuals with GSP, at least temporarily, to correct their negative perception bias about private aspects of the self, concerning social situations, while it enhances public self-consciousness.

Changes in public self-awareness have also been observed when presenting social phobic patients with their videotaped performances of social tasks (Rapee & Hayman, 1996). These findings are consistent with the cognitive model of social phobia. However, our results are inconsistent with the notion that heightened self-focused attention automatically leads to negative self-perception in individuals with social phobia (e.g., Clark & Wells, 1996). In fact, the presence of a mirror led to fewer and not more negative self-statements about socially-relevant personality characteristics in individuals with GSP.

This study is limited by the reliance on only one technique to measure self-perception. Furthermore, it is certainly possible that the mirror-induced changes in self-perceptions are not specific to social phobia, and a number of uncontrolled variables could have affected the results. However, the procedure was identical for both social phobia subtypes. Furthermore, a comparison with our previous study (Hofmann & Heinrichs, 2002) suggests that individuals with nongeneralized social phobia are similar to a normal student sample in their response to the mirror manipulation. Finally, we were able to rule out the effects of gender differences, which could be an important variable in an experiment involving mirror manipulation (e.g., Gutierrez, Kenrick, & Partch, 1999; Schmitt & Buss, 2000).

Despite these limitations, our findings provide further evidence for a psychopathological difference between the two social phobia subtypes. Moreover, these results raise important questions about the treatment of this disorder. Specifically, one could hypothesize that interventions specifically tailored towards improving negative self-perceptions (via the use of video-feedback and mirror exposure) might be particularly helpful for individuals with GSP.

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Table 1
Comparison Between Participants with (N = 27) and without (N = 25) Mirror Exposure in Self-Statements
(Generalized Social Phobia Subtype Only).

Category	Without Mirror			With Mirror			Mann-Whitney U - Test
	U	M	SD	U	M	SD	
Appearance							
Positive	23.46	0.04	0.20	29.31	0.56	1.09	261.50*
Negative	23.00	0.00	0.00	29.74	0.56	1.09	250.00**
Competence							
Positive	29.78	.44	0.58	23.46	1.19	0.48	255.50
Negative	25.54	0.04	0.20	27.39	0.11	0.32	313.50
Social PC							
Positive	27.14	1.36	0.81	25.91	1.30	1.06	321.50
Negative	32.06	1.44	0.96	21.35	0.74	0.66	198.50***
Non-social PC							
Positive	26.60	0.92	0.81	26.41	0.96	1.01	335.00
Negative	25.58	1.48	0.96	27.35	1.59	0.40	314.50
“other”							
Positive	27.04	0.04	0.20	26.00	0.00	1.04	324.00
Negative	27.04	0.04	0.20	26.00	0.00	1.04	324.00

* Note: p < .05;

** p < .01;

*** p < .005 (all two-tailed). Social- PC: Socially relevant personality characteristics; Non-social PC: Non-socially relevant personality characteristics. The Table shows mean rank values (U), means (M), and standard deviations (SD) of self-statements and the results of Mann-Whitney U-tests comparing individuals with and without mirror exposure.

Table 2

Comparison Between Participants with (N = 14) and without (N = 16) Mirror Exposure in Self-Statements (Non-generalized Social Phobia Subtype Only).

Category	Without Mirror			With Mirror			Mann-Whitney U - Test
	<u>U</u>	<u>M</u>	<u>SD</u>	<u>U</u>	<u>M</u>	<u>SD</u>	
Appearance							
Positive	14.81	0.13	0.34	16.29	0.36	0.84	101.00
Negative	14.00	0.00	0.00	17.21	0.36	0.00	88.00
Competence							
Positive	15.31	.50	0.73	15.71	0.50	0.65	109.00
Negative	14.44	0.06	0.25	16.71	0.21	0.43	95.00
Social PC							
Positive	15.22	1.00	1.10	15.82	1.00	1.11	107.50
Negative	15.00	1.00	0.73	16.07	1.14	0.95	104.00
Non-social PC							
Positive	15.50	1.00	1.10	15.50	1.00	1.11	112.00
Negative	20.00	1.88	0.62	10.36	0.93	0.83	40.00***
“other”							
Positive	15.00	0.00	0.00	16.07	0.02	0.27	109.00
Negative	14.91	0.02	0.25	16.18	0.21	0.58	90.00

*** Note: $p < .005$ (two-tailed). Social-PC: Socially relevant personality characteristics; Non-social PC: Non-socially relevant personality characteristics. The Table shows mean rank values (U), means (M), and standard deviations (SD) of self-statements and the results of Mann-Whitney U-tests comparing individuals with and without mirror exposure.