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Analysis of Social Behavior in Individuals with Social Phobia and Nonanxious Participants Using a Psychobiological Model

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Abstract

This study sought to test hypotheses derived from Trower and Gilbert's (1989) psychobiological/ethological model of social anxiety. This model purports that social anxiety should be characterized by less social cooperation and dominance and greater submission and escape/avoidance. Individuals with social phobia and nonanxious participants completed a structured social interaction. Behavioral measures related to cooperativeness, dominance, submissiveness, and escape/avoidance were coded by independent observers. Those with social phobia exhibited fewer behaviors of social cooperativeness and dominance than did nonanxious participants. The groups did not differ with regard to submissive and escape/avoidance behaviors. Two dominance behaviors correlated with a self-report measure of social anxiety. Implications for the Trower and Gilbert model and for social anxiety theory and treatment are discussed.

Social phobia is an excessive fear of social situations in which the person anticipates scrutiny from others, resulting in irrational expectations of humiliation and embarrassment. People with social phobia fear various situations, including conversing, drinking, eating, public speaking, and being observed by others (American Psychiatric Association, 1994). It has become generally accepted that social phobia affects a significant portion of the population—approximately 13% at some time during the lifespan (Kessler et al., 1994). Onset

usually occurs during adolescence and continues to affect functioning into adulthood (Amies, Gelder, & Shaw, 1983).

Trower and Gilbert's (1989; Trower, Gilbert, & Sherling, 1990) ethological/psychobiological model of social anxiety provides a tentative framework for understanding the behavior associated with social phobia (see also Gilbert, 1993; Gilbert & Allan, 1994). According to the model, humans constantly appraise internal and external environmental cues, comparing them to internal standards. When discrepancies are not perceived, no further action is taken. Yet, when a discrepancy is perceived, this appraisal system activates a coping system in which responses are selected to reduce the discrepancy. The selection of responses is based on the probable efficacy of various behaviors (behavior-outcome expectancies) and the probability of successfully executing such behaviors (efficacy-outcome expectancies). Once behavioral responses (or nonresponses) are enacted, the situation is reevaluated under the appraisal system in a continuous feedback loop.

The model posits that the appraisal and coping systems of socially anxious individuals are guided by a competitive social schema, while nonanxious people operate under a schema of cooperativeness. These schema derive from two separate psychobiological systems—the defense system and the safety system—which ensure survival in either competitive/hierarchical or cooperative social environments, respectively.

Social anxiety is posited to occur in the context of the defense system, which includes dominance hierarchies and associated strategies evolved to handle intraspecies conflict and facilitate the functioning of complex social groups. Access to resources is associated with higher positions in the hierarchy, and group members have a primary goal of competing for higher rank or at least maintaining their current rank. Interactions are focused on attention to the dominant member; subordinate members' anxiety toward the dominant member and willingness to signal submission prevents conflict. Within this defense system, socially anxious individuals continuously appraise situations, monitoring their behavior and checking for potential threat. Submissive behaviors serve as coping responses that inhibit aggression from the dominant member and allow the subordinate to remain part of the social group and in the proximity of the dominant.

A hierarchy of goals is proposed within the defense system. The primary goal is to achieve the dominant position in social interactions, an internal standard of the appraisal system. This includes strategies of social competition and dominance behavior. Trower and Gilbert (1989) postulated that socially anxious people have low expectancies for achieving this goal and cope by adjusting the internal standard to a second-level goal—to avoid harm/rejection from the dominant and remain in the social interaction. The associated strategy is one of submission and appeasement. This leads to further reevaluation of the situation. If the socially anxious person perceives that even submissive behavior is unlikely to be successful, further adjustment is made to the third-level goal of avoiding perceived threat from the dominant, with a strategy of escape/avoidance behavior. Also included is a fourth-level state, not qualifying as a goal, which includes resignation and despair, with depression as the predominant mood. The associated strategy is one of helplessness.

In contrast to the primitive defense system, the safety system is the more recently evolved alternative organization of social behavior found in humans and some primates. In the safety system, conflict is inhibited, not by dominance and submission, but by the

dominant individual sending signals of reassurance, which increase approach behavior. Defensive arousal then remains low and competition is replaced by cooperation, with appreciation and social attention replacing dominance and submission as the primary reinforcers of social behavior. It is theorized that social anxiety is not a primary product of the safety system.

With regard to the interaction between the defense and safety systems, Trower and Gilbert (1989) have suggested most people, socially anxious and nonanxious, utilize both the safety and defense systems at certain times. Activation of a particular system depends upon an individual's construal of the situation. Socially anxious individuals are more likely to construe social situations as dangerous, and nonanxious are more likely to construe social situations as nonthreatening. However, given that the two systems are interactive and phylogenetically founded, it is also unlikely that nonanxious people have entirely transcended the patterns of the defense system. Yet, even when nonanxious people employ the defense system, their lesser expectancies of threat and harm will cause them to evaluate their own social behavior with greater expectancies of success. Hence, it is expected that, to the extent that nonanxious people do behave within the defense system, social behavior is largely characterized by dominance rather than submission and escape/avoidance.

Trower and Gilbert's (1989) model is consistent with the empirically supported self-presentation theory of social anxiety (Leary & Kowalski, 1995), which proposes that social anxiety results from individuals desiring to make a certain impression on others and doubting their ability to do so. However, Trower and Gilbert go beyond the self-presentation theory in some ways. First, the model proposes a more specific mechanism by which the individual appraises social situations and adjusts his/her behavior to reduce discrepancies between goals and expectancies. Second, Trower and Gilbert propose a more specific pattern of behavior for social anxiety and place this pattern within a larger context of psychological social development.

Some research provides indirect support for the Trower and Gilbert (1989) model. The information processing style of socially anxious people is consistent with the defense system, involving selective attention and excessive processing of environmental cues perceived as socially threatening. Specifically, social anxiety is associated with more attention to how one presents to others (Hope & Heimberg, 1988), selective attention to negative feedback in social situations (O'Banion & Arkowitz, 1977), and excessive processing of social threat cues (Hope, Rapee, Heimberg, & Dombeck, 1990; McNeil et al., 1995).

Several studies also suggest that socially anxious behavior is consistent with the defense system of the Trower and Gilbert (1989) model. Socially anxious participants tend to behave innocuously in social interactions (Leary, 1983; Leary, Knight, & Johnson, 1987) and make greater use of excuses and apologies (Edelman, 1987; Schlenker, 1987). Socially anxious participants also speak less and with longer pauses than nonanxious subjects (Dow, Biglan, & Glaser, 1985; Fischetti, Curran, & Wessberg, 1977). This suggests that socially anxious people tend to operate under Trower and Gilbert's second-level goal of the defense system, characterized by submission. Escape and avoidance of feared situations is a common behavioral feature of social anxiety (Arkowitz, Lichtenstein, McGovern, & Hines, 1975; Leary), consistent with the third-level goal of the defense system. Though these behaviors of social anxiety have been interpreted as social skill deficits, Trower and Gilbert

have argued that anxious people use submissive behavior as intentional strategies suited to their cognitive appraisal of the situation.

More specifically, a number of the behaviors measured in the present study have been used in prior social phobia research. For nonverbal behaviors, some studies show a positive relation between social anxiety and gaze aversion (e.g., Arkowitz et al., 1975; Daley, 1978; Modigliani, 1971), while others find this only for males (e.g., Beidel, Turner, & Dancu, 1985; Pilkonis, 1977) or not at all (Segrin & Kinney, 1995). Frequency of head nods is positively related to social anxiety in women (Pilkonis). Body orientation (e.g., eye-contact and facing the partner) and gesturing (e.g., head nods) are also related to social anxiety (Monti et al., 1984). Anxious participants have also been shown to spend less time (i.e., escape) in a forced social interaction than nonanxious participants (Twentyman & McFall, 1975). For verbal behaviors, social anxiety has been related to fewer interruptions (Natale, Entin, & Jaffe, 1979). Leary et al. (1987) found social anxiety to be related to fewer instances of providing information and verbal agreements but unrelated to commands and asking questions.

As seen in this brief review, previous findings have supported Trower and Gilbert's (1989) theory. However, most of that support is indirect, and only one study, described below, has been designed to directly test their predictions. Furthermore, cooperation and dominance have been largely excluded from the study of socially anxious behavior.

Hope, Sigler, Penn, and Meier (1997) is the only known study to directly test hypotheses from the Trower and Gilbert (1989) model. That study used the Impact Message Inventory (IMI; Kiesler, 1987) to measure the subjective experiences of participants during a social interaction. Using an analogue sample of high and low social anxiety groups, same-sex pairs were formed. For each pair, one participant held a 5-minute conversation with a confederate, while the other participant observed the interaction. Following the interaction, both participant and observer completed the IMI with regard to the impact the participant had on the confederate.

Results indicated that socially anxious participants rated themselves higher in competitiveness, submissiveness, and succorance-seeking than did nonanxious participants, as predicted by the Trower and Gilbert (1989) model, while observer ratings revealed no differences on those subscales. Anxious and nonanxious participants did not differ on the dominance and deference subscales, either by self or observer ratings. This suggests that anxious participants viewed the interaction as competitive, without attempting to compete with the confederate through observable dominance strategies. Rather, participants interpreted their own experience of the interaction as submissive and in need of help and relief, relative to nonanxious participants. However, this submissive strategy was not discerned by those observing the interaction.

While supporting the model, this study was not without limitations. First, the study used an analogue sample to test hypotheses better explored using clinical participants with social phobia and nonanxious controls. This would provide a more powerful and naturalistic test of the model, and increase the clinical generalizability of the findings. Second, the study used primarily measures of the defense system, with no assessment of the safety system. Third, the study relied upon self-report and global observation measures. Given that this is a theory of social behavior, it is important to test the utility of the Trower and Gilbert (1989) model by measuring specific observable behaviors representing the relevant

constructs. The observable behavior of persons with social phobia has not yet been investigated as conceptualized under this model.

Though the Trower and Gilbert (1989) model has implications for etiological factors, the major emphasis is on maintaining factors in social anxiety. The correlational design of the present study limits testing the model in terms of maintaining factors, rather than etiological causes of social phobia. The behaviors assessed were those indicative of the safety system and the first three levels of the defense system. It was hypothesized that during a social interaction, nonanxious participants would exhibit more behavior indicating cooperativeness and dominance than would those with social phobia. It was also hypothesized that those with social phobia would behave more submissively and evidence greater escape/avoidance behavior than would nonanxious participants. Finally, we expected that a self-report measure of social anxiety would be negatively related to both cooperative and dominance behaviors but positively related to submissive and escape/avoidant behaviors.

Method

Participants

Fifty-three individuals diagnosed with social phobia (21 men and 32 women) and 28 non-anxious participants (10 men and 18 women) were solicited through community media announcements for participation in a larger study on anxiety and depression. Two announcements were used. The first described a free psychosocial treatment for social phobia in exchange for research participation. The second was typical of university announcements offering payment for research participation. Those with social phobia were offered treatment instead of payment to preclude the exaggeration of symptoms for monetary compensation.

Participants were first screened with a telephone interview to ensure they had met the inclusion criteria described below. Participants were then interviewed using the *Anxiety Disorders Interview Schedule-Revised* (ADIS-R; DiNardo & Barlow, 1988) and the mood disorders section of the *Structured Clinical Interview for the DSM-III-R* (SCID; Spitzer, Williams, Gibbon, & First, 1989). Those who received a primary *Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R; American Psychiatric Association, 1987)* diagnosis of social phobia, or had never met criteria for any Axis I disorder (nonanxious group), and did not meet the exclusion criteria described below, were invited to participate in the remainder of the study. A primary diagnosis is defined in the ADIS-R as that with the highest clinician's severity rating (CSR). The CSR is a global 0-to-8 rating of symptom severity and interference in functioning made by the interviewer. A CSR of 4 or greater indicates a disorder of clinical severity. For those with social phobia, only participants achieving this criterion were included in the sample (CSR $M = 5.45$, $SD = .99$). This mean is similar to previous samples of persons with social phobia seeking treatment in anxiety specialty clinics (e.g., Heimberg et al., 1990). Exclusion criteria included (a) current drug/alcohol abuse; (b) psychotic or thought disorder; (c) mental retardation; and (d) repeated arrests/convictions, hospitalizations, and/or suicide attempts that indicated probable antisocial or borderline personality disorder. Nonanxious participants were also excluded if they had ever received mental health services.

Diagnostic interviews were conducted by a licensed clinical psychologist or advanced doctoral students. Although diagnostic reliability was not directly assessed, all ADIS-R interviewers were trained to rigorous standards specified by the authors of the instrument.¹ This included exact diagnostic agreement with a trained interviewer on five consecutive administrations prior to conducting independent interviews. All ADIS-R interviews and diagnostic decisions were presented and reviewed at weekly staff meetings. Previous reports have indicated acceptable reliability ($kappa = .79$) for a diagnosis of social phobia using the ADIS-R (DiNardo, Moras, Barlow, Rapee, & Brown, 1993).

Twenty-two of those in the social phobia sample experienced clinically significant depression as indicated by a secondary diagnosis of a depressive disorder ($n = 5$) or a Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) score greater than or equal to 20 ($n = 17$). Because Trower and Gilbert (1989) hypothesized that depression indicates resignation and hopelessness rather than one of the goal states thought to be associated with social anxiety, these 22 subjects were excluded from the analyses. Additionally, 16 participants (9 with social phobia and 7 nonanxious participants) were excluded due to technical problems with the videotaped role-play. The final sample included 22 participants with social phobia (9 men and 13 women) and 21 nonanxious participants (9 men and 12 women). Included and excluded participants with social phobia did not significantly differ in either age or global severity (CSR). Included and excluded nonanxious participants also did not differ in age.

The ADIS-R interviewer also interviewed all potential participants using the avoidant personality disorder section of Loranger's *Personality Disorders Examination* (Loranger, 1988). Nine of the 53 participants with social phobia in the initial sample and none of the nonanxious controls met *DSM-III-R* criteria for avoidant personality disorder (AVPD). Only 4 of the final sample of 22 people with social phobia used in this study, as described below, met criteria for AVPD. Given the small number of individuals in the final sample with AVPD, this diagnostic category was not used as an independent variable.

Using the criteria outlined by Heimberg, Holt, Schneier, Spitzer, and Liebowitz (1993), the social phobia group included 7 participants with nongeneralized social phobia (fears in multiple situational domains, but at least one domain unaffected) and 15 with generalized social phobias (fears across all situational domains). No participants with discrete social phobia (most often public speaking phobia) sought participation in the study. All of those with social phobia identified conversations as one of their fears during the ADIS-R interview. Of the total sample, 52.4% were married and 47.6% were single; 85.7% were employed full-time, while 14.3% were either unemployed or worked part-time. In terms of education level, 23.8% had graduate/professional degrees, 23.8% had an undergraduate degree, and 52.3% had completed high school only. Chi-square analyses revealed no significant differences between those with social phobia and nonanxious participants on these demographic characteristics. The socially phobic group ($M = 39.57$, $SD = 11.47$) and the nonanxious group ($M = 38.71$, $SD = 11.88$) also did not significantly differ in age. The sample was over 94% Caucasian.

Behavioral Measures

Social interaction role-play

Data reported here are from one of three role-plays (two conversations and a brief speech) completed by participants in the larger study. This social interaction role-play required participants to hold a 4-minute conversation with a stranger and was selected from a larger set developed by Bellack, Morrison, Mueser, Wade, and Sayers (1990) and modified for use with a population with social phobia. The scenario of a conversation with a stranger has been used extensively with social phobia (e.g., Herbert, Hope, & Bellack, 1992) and was considered appropriate for this sample, who all reported fears of conversations. Participants were taken to the laboratory and placed facing the confederate before a video camera with a table situated behind them. The experimenter then explained the scenario: The participant has just noticed the other person moving into their neighborhood. They were asked to start a conversation to get acquainted. Participants could discuss anything they wished, with the exception of the experiment itself.

Undergraduates served as role-play confederates. All 11 confederates were female, Caucasian, and blind to the participants' group membership. Confederates were trained on a series of practice role-plays to present as consistently warm, though not overly friendly, within and across role-plays. For example, if a pause occurred during the conversation, confederates were trained to wait for the participant to break the pause until it was apparent that he or she would not do so (after silently counting to 10). To control the effects of varying confederate behavior/characteristics, confederates were distributed randomly between and within participant groups. The experimenter was present during the role-play and provided corrective feedback to the confederate after the role-play when they deviated from established procedure.

Nonverbal behavioral measures

Several behavioral measures were selected to assess each of the following constructs: cooperativeness, dominance, submissiveness, and escape/avoidance. Cooperativeness was assessed by head-nodding and facing the other person. Dominance was measured by standing with an erect posture, while the converse of leaning back against foreign objects (e.g., table, wall) was indicative of escape/avoidance. Submissiveness was represented by gaze aversion (i.e., looking away from the other person). Finally, escape/avoidance behavior was assessed as leaning against a supporting object (i.e., the absence of standing erect), clutching or holding onto the table, looking to the experimenter, and actually attempting to terminate the role-play (i.e., escape). These behavioral measures were derived from previous work on social behavior. It should be noted that although facing the other person and gaze aversion are conceptually similar, the two differ in the areas of the body involved. That is, gaze aversion is concerned with eye contact, while facing the other person has to do with the angular position of the entire body relative to the other person.

Kalbaugh and Haviland (1994) demonstrated reliable coding for head nods and facing other people as indicators of social approach behavior. During intrafamilial interactions, these behaviors of affiliation and acceptance differed predictably, depending upon the particular family members interacting, and are thought to indicate cooperation and invitation

for continued interaction. Ohman (1986) has suggested that an erect stance is the typical posture of humans and other primates assuming dominant social roles. Further, it was suggested that gaze aversion is a hallmark behavior of social submission and functions in preventing conspecific conflict. The escape/avoidance behaviors of backward leaning and clutching were derived from the primate work of Cook and Mineka (1989, 1990), in which fear reactions were observationally conditioned in rhesus monkeys. Resultant of conditioned fear, primates consistently moved away from feared stimuli and displayed greater levels of leaning back against and clutching the cage. Finally, the behaviors of actual escape and looking to the experimenter were selected on the basis of apparent face validity and ease of coding.

All nonverbal behaviors were independently coded by the primary author and four undergraduate assistants. The coders were blind to the research hypotheses and participants' group membership. Escape and looking at the experimenter were coded with frequency counts, tallying the number of times they occurred. Facing the other person, head-nodding, gaze aversion, clutching, and standing versus leaning were coded using instantaneous sampling. Under this procedure, coders viewed the role-plays marked at 10-second intervals. At the end of each interval, coders made a forced-choice decision of whether each behavior had occurred at that very instant. Instantaneous sampling was used in light of arguments made favoring the procedure over interval time-sampling procedures in which behaviors are coded as either present or absent during defined intervals of time. Leger (1977) and Ary (1984) have argued that instantaneous sampling more accurately estimates the duration of behavior in real time than does interval time-sampling. For this study, nonverbal behaviors not coded by frequency counts were coded using both procedures. Codes from the two procedures were highly correlated (r s from .74 to .94). To prevent redundancy, only the instantaneous data were used in further analyses. Using practice tapes, coders were trained to a criterion of 90% agreement with the primary author on all nonverbal behaviors before coding behaviors independently.

Verbal behavior

Cooperation was represented by verbal explanations and praise. Dominance was assessed with commands, providing information, bragging, arguing/refuting, and interruptions. Submission was assessed by verbal agreement and requests for information. Definitions for the verbal behaviors were adapted for the present study from previous work providing construct validity for those verbal responses as indicators of the appropriate constructs. Small, Zeldin, and Savin-Williams (1983) provided evidence for explanations and praise as prosocial behaviors, with reliable coding and temporal stability. Multitrait-multimethod analysis revealed that both behaviors were consistent with peer perceptions of prosocial activity. Commands and providing information have been supported as expressions of social dominance (Moskowitz, 1990; Moskowitz & Schwartz, 1982; Small et al., 1983). Convergent validity for these behaviors was provided by correlations with global ratings of dominance in social interactions. In addition, Small et al. supported the utility of argument/refutation and interruptions as indicators of dominance. Multitrait-multimethod evidence for their validity included systematic relationships between those behaviors and peer ratings of

dominance. This research also provided evidence for agreements and requests for information as representing submission by their inverse relation to dominance (Small et al.).

As with the nonverbal behaviors, all verbal behaviors were coded by the primary author and four additional observers who were blind to hypotheses and group membership. Verbal behaviors were coded using frequency counts. Coders viewed the role-plays and coded each participant utterance for all applicable verbal behaviors. With utterances defined as complete turns taken during the conversation, a single utterance could qualify for more than one verbal code. Using practice tapes, coders were trained to a criterion of 90% agreement with the primary author on all verbal behaviors, before coding tapes independently.

Coding and interrater reliability

Interrater reliability (IRR) coefficients were calculated for all coders on all behavioral measures as the number of agreements divided by agreements plus disagreements. Participants' scores were then calculated by averaging the codes from the three most reliable of the four additional coders. The codes from the primary author were used only in assessing reliability and not in calculating participants' scores. Following the recommendations of Rosenthal and Rosnow (1991), Spearman-Brown aggregate reliability coefficients were also calculated to determine the "effective" reliability among the total set of three coders and the primary author. The Spearman-Brown effective reliability coefficient guards against specific patterns of ratings that produce artificially high IRR coefficients. The range and average IRR coefficients as well as Spearman-Brown coefficients are presented in Table 1. Only the behavioral measure of escape produced an average IRR coefficient below 80%. Similarly, only the verbal behavior of interruptions (.73) produced an effective reliability below .80. Specific standards of reliability have not been recommended for use with Spearman-Brown coefficients, but these coefficients will normally be higher than simple correlations (Rosenthal & Rosnow). Both the IRR and Spearman-Brown coefficients indicate that the ratings were acceptably reliable.

Self-Report Social Anxiety

Social Phobia and Anxiety Inventory (SPAI; Turner, Beidel, Dancu, & Stanley, 1989). The SPAI is a 45-item self-report scale that assesses phobic symptoms, with both social phobia and agoraphobia subscales. A social phobia index (SPAI-SP) is calculated as the difference between the Social Phobia and Agoraphobia subscales. The SPAI has been used extensively with clinical samples of persons with social phobia and is useful in distinguishing among diagnostic groups (Turner et al., 1989). Internal consistency has been reported at .96 and .85 for the Social Phobia and Agoraphobia subscales, respectively. Two-week test-retest reliability has been reported at .86 (Turner et al.). For the purposes of this study, only the Social Phobia difference score (SPAI-SP) was used as a measure of social anxiety.

Table 1. Interrater Reliability and Spearman-Brown Aggregate Reliability Coefficients for Behavioral Measures

Behavioral Measure	Interrater Reliability		Spearman-Brown Aggregate R
	Range	Mean	
Explanations	91.89–97.10	94.92	.98
Praise	78.94–84.48	81.26	.93
Faces other person	97.40–99.78	98.91	.99
Head nods	90.32–94.73	93.15	.96
Commands	78.00–87.71	83.97	.93
Provides information	95.43–98.48	96.83	.94
Bragging	80.00–93.33	85.55	.85
Argue/refute	53.33–100.0	80.27	.93
Interrupts	80.00–86.66	84.44	.73
Standing erect vs. leaning back	92.70–98.90	95.83	.91
Agreement	90.76–97.00	93.86	.90
Requests information	94.84–99.47	96.58	.99
Gaze aversion	92.15–94.40	93.65	.95
Clutching	89.24–97.74	92.29	.82
Looks to experimenter	84.70–93.80	87.73	.98
Escape	50.00–88.80	70.33	.91

Subjective anxiety

Participants rated their subjective anxiety before, during, and after the role-play using the Subjective Units of Discomfort Scale (SUDS; Wolpe & Lazarus, 1966). Participants made the first SUDS rating just prior to the role-play. Following the role-play, participants rated their peak subjective anxiety during the role-play and their current anxiety. Participants also rated their performance quality during the role-play on a 0-to-100 scale, with higher scores indicating better performance.

Results*Manipulation Check*

To ensure the role-play was anxiety-provoking for socially phobic participants but not for the nonanxious group, a 2 (*group*: social phobia vs. nonanxious) \times 2 (*gender*: male vs. female) \times 3 (*time*: before social interaction, peak, and after social interaction) mixed factorial ANOVA was conducted with SUDS rating as the dependent variable. One participant was excluded due to missing SUDS data. As shown in Figure 1, those with social phobia ($M = 60.23$, $SD = 20.14$) reported significantly more anxiety overall than did nonanxious participants ($M = 23.35$, $SD = 18.17$), $F(1, 38) = 56.28$, $p < .001$. There was also a significant effect for time of SUDS rating, $F(2, 76) = 26.99$, $p < .001$. Follow-up analyses indicated that peak SUDS ratings ($M = 53.45$, $SD = 29.23$) were higher than ratings before ($M = 39.88$, $SD = 26.26$), $t(41) = 4.36$, $p < .0001$, or after ($M = 33.05$, $SD = 24.07$), $t(41) = 8.53$, $p < .0001$, the role-play. SUDS ratings before and after the role play also differed significantly, $t(41) = 2.50$, $p < .05$. The main effect of gender and the group \times time, gender \times time, and group \times gender

× time interactions were not significant. A between-groups ANOVA was conducted with group as the independent variable and subjects' ratings of their own performance quality as the dependent variable. Nonanxious participants ($M = 63.57$, $SD = 19.95$) judged their own performance to be of higher quality than did those with social phobia ($M = 36.19$, $SD = 20.12$), $F(1, 40) = 19.62$, $p < .001$.

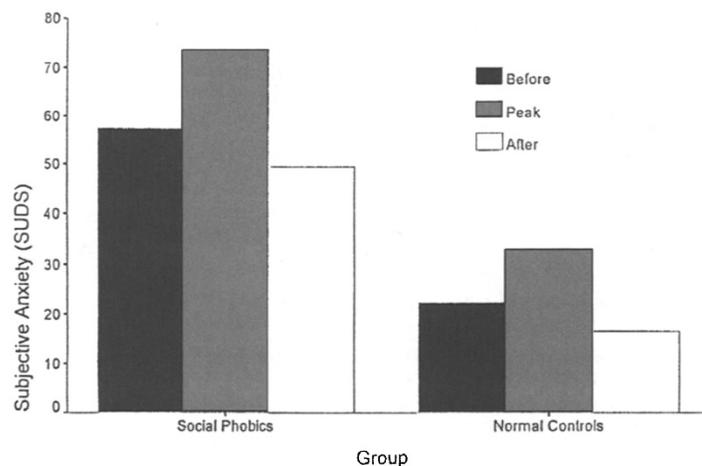


Figure 1. Subjective anxiety ratings before, peak, and after role-play by group.

Group Differences

To reduce the risk of Type I errors, analyses of individual variables were conducted only after significant multivariate effects were found on groups of conceptually related variables. Four 2 (*group*: social phobia vs. nonanxious) × 2 (*gender*: male vs. female) between-groups MANOVAs were conducted with dependent measures grouped by construct-cooperativeness, dominance, submissiveness, and escape/avoidance. To prevent redundancy, the behavior of standing versus leaning (representing dominance or escape/avoidance, respectively) was used only in the analysis for dominance. Means and standard deviations by group and gender for all behaviors are presented in Table 2. Table 2 also indicates which individual behaviors evidenced significant between-group differences.

The MANOVA for cooperativeness revealed a significant main effect for group, $F(4, 36) = 3.54$, $p < .015$, Wilks' lambda = .72. Neither the main effect of gender nor the group × gender interaction were significant. Univariate analyses indicated that nonanxious participants exhibited more verbal praise, $F(1, 39) = 5.36$, $p < .026$, and faced the other person more often, $F(1, 39) = 6.53$, $p < .015$, than those with social phobia. The two groups did not differ on either head nods or verbal explanations.

Table 2. Means and Standard Deviations by Group and Gender for Verbal and Nonverbal Behaviors

Behavior	Group		Gender	
	Nonanxious (<i>N</i> = 21)	Social Phobia (<i>N</i> = 22)	Men (<i>N</i> = 18)	Women (<i>N</i> = 25)
Cooperation				
Explanations	2.57 (2.11)	4.10 (3.37)	3.51 (3.54)	3.36 (2.84)
Praise	1.60 (1.52) _a	.69 (.68) _b	1.18 (.89)	1.10 (1.46)
Faces other person	.98 (.04) _a	.74 (.41) _b	.86 (.31)	.85 (.33)
Head nods	.26 (.17)	.19 (.16)	.18 (.18)	.26 (.15)
Dominance				
Commands	1.71 (1.56) _a	.69 (.75) _b	.83 (.68)	1.45 (1.58)
Provides information	9.57 (3.17)	8.78 (3.55)	8.55 (3.37)	6.69 (3.31)
Bragging	.57 (.49) _a	.09 (.23) _b	.31 (.33)	.33 (.52)
Argue/refute	.36 (.69)	.10 (.21)	.12 (.20)	.30 (.65)
Interrupts	.73 (.63)	.45 (.68)	.75 (.79)	.46 (.55)
Stands erect vs. leans back	.82 (.29)	.94 (.14)	.84 (.23)	.92 (.22)
Submissiveness				
Agreement	1.65 (1.78)	1.22 (1.24)	1.09 (1.25)	1.68 (1.68)
Requests information	14.17 (6.18)	12.07 (5.86)	12.46 (6.58)	13.56 (5.71)
Gaze aversion	.17 (.14)	.20 (.18)	.24 (.18)	.15 (.13)
Escape/avoidance				
Clutching	.06 (.21)	.08 (.14)	.05 (.11)	.08 (.21)
Looks to experimenter	1.09 (1.65)	1.98 (2.68)	1.35 (1.83)	1.69 (2.55)
Escape	.25 (.64)	.46 (1.09)	.40 (.99)	.33 (.84)

Note: Means with different subscripts differ at $p < .05$. Standard deviations are in parentheses. Total $N = 43$.

Similarly, the MANOVA for dominance indicated a significant main effect for group, $F(6, 34) = 4.12$, $p < .003$, Wilks' lambda = .58. The gender and group \times gender effects were not significant. Univariate tests revealed that nonanxious participants used more commands, $F(1, 39) = 6.64$, $p < .014$, and bragged more often, $F(1, 39) = 14.54$, $p < .0001$, than did those with social phobia. The two groups did not differ on interruptions, providing unsolicited information, argument/refutation, or standing erect/leaning back.

The MANOVA for submissiveness indicated neither a main effect for group nor gender. There was a significant group \times gender interaction, $F(3, 37) = 3.01$, $p < .042$, Wilks' lambda = .80. Though no single univariate follow-up test was significant, there was a univariate trend for the interaction on requests for information, $F(1, 39) = 3.86$, $p < .057$. This suggests a tendency for nonanxious males ($M = 15.59$, $SD = 7.06$) to ask more questions than males with social phobia ($M = 9.33$, $SD = 4.49$), while nonanxious females ($M = 13.11$, $SD = 5.51$) asked fewer questions than females with social phobia ($M = 13.97$, $SD = 6.10$).

The MANOVA for escape/avoidance revealed neither a main effect for group nor gender. The group \times gender interaction was also not significant. None of the univariate follow-up tests for individual escape/avoidance behaviors were significant.

Correlations

Inspection of bivariate scatterplots suggested nonnormal relationships between scores on the SPAI-SP and the following variables: facing the other person, argue/refute, interruptions, standing vs. leaning, and escape. For these variables, the Spearman rank-order correlation coefficient was calculated to determine the degree of relation with SPAI-SP scores. For the remaining variables, Pearson correlations were used. One participant did not provide a SPAI-SP score. Correlations used 42 of the 43 participants and are presented in Table 3. A Bonferroni correction was applied to correlations within each family of variables, yielding the following cutoffs for significance: cooperativeness ($p < .012$), dominance, ($p < .008$), and both submission and escape/avoidance ($p < .016$). Social anxiety was negatively related to the dominance behaviors of commands, bragging, and interruptions. No other dominance behaviors reached significance. Additionally, the single cooperative behavior of facing the other person was negatively related to social anxiety. None of the submissive or escape/avoidance behaviors were significantly related to the SPAI-SP. Yet, it should be noted that some of the nonsignificant correlations appear to show nonsignificant trends and may have failed to reach significance for lack of statistical power. This is particularly relevant for the dominance behavior of providing information, and the cooperativeness behavior of verbal praise.

Table 3. Correlations between SPAI-SP and All Verbal and Nonverbal Behaviors	
Behavior	SPAI-SP ($N = 42$)
Cooperativeness	
Explanations	.35
Praise	-.37
Faces other person (r_s)	-.39*
Head nods	-.21
Dominance	
Commands	-.49*
Provides information	-.33
Bragging	-.44*
Argue/refute (r_s)	-.20
Interrupts (r_s)	-.48*
Stands erect vs. leans back (r_s)	.16
Submissiveness	
Agreement	-.09
Requests information	-.11
Gaze aversion	.13
Escape/avoidance	
Clutching	.10
Looks to experimenter	.24
Escape (r_s)	.22

Note: SPAI-SP = Social Phobia and Anxiety Inventory—Social Phobia subscale. Different N s are because of missing data for some participants. A Bonferroni correction was applied within each family of variables. Spearman correlations are indicated by (r_s).

* $p < .0125$, ** $p < .008$

Discussion

This study investigated hypotheses derived from Trower and Gilbert's (1989; Trower et al. 1990) model of social anxiety. Individuals with social phobia were compared to nonanxious participants on a battery of verbal and nonverbal behaviors derived from that model. We also tested the relationship between those behaviors and a continuous measure of social anxiety (SPAISP). It was hypothesized that those with social phobia would exhibit fewer cooperativeness and dominance behaviors than nonanxious participants. These hypotheses were partially supported. For cooperativeness, two out of four behaviors evidenced significant between-group differences: Those with social phobia used less praise and faced the other person less than did nonanxious participants. The groups did not differ on the cooperative behaviors of head nods and verbal explanations. Correlations between cooperative behaviors and self-reported social anxiety demonstrated a negative relationship with facing the other person and a nonsignificant negative trend for verbal praise. In the case of dominance, only two behaviors demonstrated significant between-group differences: Those with social phobia used fewer commands and bragging than did nonanxious participants. The groups did not differ on the dominance behaviors of providing information, argument/refutation, interruptions, or standing erect. Self-report social anxiety was negatively related to three dominance behaviors: commands, bragging, and interruptions. We also hypothesized that participants with social phobia would evidence greater submissive and escape/avoidance behaviors than nonanxious participants. Neither hypothesis was supported. Individuals with social phobia and nonanxious participants did not differ on any submissive or escape/avoidance behavior, nor were these behaviors related to self-report social anxiety.

Although these results provide some support for the model, that support is limited. Both cooperativeness and dominance evidenced multivariate between-group differences, but these were limited to a minority of all the behaviors measured. Only four behaviors were significantly correlated with the SPAI-SP. The focus of this study was on behaviors that reliably distinguish between socially phobic and nonanxious individuals. In that regard, the current findings are promising but limited.

Before further discussion of the results, several limitations of the present study should be acknowledged. First, the negative results for submissiveness and escape/avoidance may have been partially due to less than comprehensive measurement of those constructs. The literature on human social behavior yielded few potential measures appropriate for the situation in this study. Hence, a number of submissive and escape/avoidance behaviors were derived from the primate literature. A less than direct relationship between the social behavior of humans and nonhuman primates may have limited the utility of those behaviors in testing the model. Particularly relevant are the behaviors of standing erect vs. leaning back as indicators of dominance and escape/avoidance, respectively. Although standing erect seems to represent taking a dominant position in social interactions, this may not be sufficiently distinct from standing with a rigid, intense posture that could indicate anxiety. Likewise, leaning back against foreign objects was construed as to indicate escape, but may not have been distinct from a relaxed posture, indicative of a lack of anxiety. Hence, a lack

of specificity in the coding procedures may have limited the utility of these two behaviors in the present study.

Second, confederates in the social interactions were trained to present themselves as a consistent stimulus. This increased internal validity but limited the breadth of the social situation. This raises the question of whether similar results would be obtained with a less structured conversation that allowed more ad-lib behavior by confederates. Additionally, this study used all female confederates for the role-plays. Gender of the interaction partner is not central in the Trower and Gilbert (1989) model, but individuals may behave differently in heterosocial versus same-sex interactions. However, there is little evidence that this occurred in the present study. Gender was generally unrelated to the behaviors in this study (with the exception of the MANOVA on submissiveness). Men and women also did not differ on subjective anxiety during the role-play. However, it should be noted that the lack of significant group \times gender interactions may have been due to low statistical power. Also, only one type of social interaction was used. Future research should explore whether these findings generalize to other social situations commonly feared by persons with social phobia, such as public speaking, unstructured conversations, and group interactions.

The most important limitation of this study concerns the lack of a formal assessment of diagnostic reliability. This is especially important since those with social phobia were solicited from the community, rather than self-referred for psychological services. The question remains that some individuals may have been included in the study who did not qualify for a diagnosis of social phobia, though this seems unlikely. First, the training criteria for the ADIS-R (and as used in this study) include rigorous standards of diagnostic agreement. The ADIS-R has also been shown to produce good diagnostic reliability for anxiety disorders in general, and social phobia specifically. Finally, extensive measures were taken in the execution of this study to ensure acceptable agreement (see endnote 1). Though unlikely, diagnostic errors could partially account for some of the nonsignificant findings in this study. Hence, future investigations of this model using clinical subjects should include the appropriate assessment of diagnostic agreement.

These results provide partial support for the Trower and Gilbert (1989) model of social anxiety (see also Gilbert, 1993; Gilbert & Allan, 1994; Trower et al., 1990). Specifically, the model posits that nonanxious people exhibit social behavior based largely upon cooperativeness (safety system). To the extent that they do behave within the defense system, given lower expectancies of threat and harm, nonanxious people should exhibit greater dominance rather than submission or escape/avoidance. Consistent with this, the nonanxious group showed some evidence of greater social cooperation than did those with social phobia. This suggests that socially phobic participants may have viewed this encounter as a competitive interaction, despite social cues to the contrary. Certainly, meeting a new neighbor calls for cooperative behavior (i.e., welcoming the new person) rather than competing with an intruder for limited resources. Surprisingly, those with social phobia did not display greater submissive or escape/avoidance behavior than nonanxious participants. It appears that the socially phobic participants dealt with the threat of the interaction by not cooperating with the other person and by clearly not attempting to achieve the dominant position in the interaction (i.e., passivity) rather than by active submission.

These findings are also somewhat consistent with previous research on social anxiety. The failure of socially phobic participants to display cooperative or dominant behaviors is consistent with previous work suggesting innocuous social behavior (Leary, 1983; Leary et al., 1987), while inconsistent with suggestions of marked submissive behavior (Dow et al., 1985; Edelman, 1987; Fischetti et al., 1977; Schlenker, 1987). Hence, socially phobic behavior may be defined more by a lack of cooperative and dominant behaviors (i.e., passivity) than by an active attempt to be submissive. Participants with social phobia faced the other person less than did nonanxious participants, consistent with previous findings (Monti et al., 1984). Our findings of fewer interruptions and providing information are also consistent with earlier work (Leary et al.). However, our findings indicated social anxiety to be negatively related to the use of commands, while Leary et al. found no such relationship.

Escape and avoidance of anxiety-provoking situations is well-documented for social phobia. The lack of association between escape/avoidance and social anxiety in the present study may reflect situational demands, such as the presence of an experimenter. Arkowitz and colleagues (1975) have suggested that, when unable to escape, anxious people participate only minimally in social interactions. These findings are largely consistent with this suggestion. Inconsistent with previous work, participants with social phobia did not differ in gaze aversion (e.g., Arkowitz et al.; Daley, 1978) or agreements (Leary et al., 1987).

The self-presentation model of social anxiety (Leary & Kowalski, 1995) provides further interpretation of these findings. According to that model, social anxiety occurs when one desires to make a certain impression on others and doubts his or her ability to do so. It has been argued that socially anxious people adopt a "protective" style (i.e., avoiding loss), rather than an "acquisitive" style (i.e., gaining approval), with behavior marked by reticence and withdrawal (Arkin, 1981; Leary & Kowalski). In this study, those with social phobia were distinguished by a pattern of passivity rather than active submission. Leary & Kowalski suggest that social anxiety produces "safe" behaviors such as smiling, nodding, and asking questions, while making fewer statements of fact. In this study, social anxiety was negatively related to the presumably "unsafe" behaviors of commands, bragging, and interruptions though unrelated to "safe" behaviors such as head nods and verbal agreement.

These results have implications for further understanding social anxiety. First, it appears that individuals with social phobia can be differentiated from nonanxious persons on the basis of observable social behavior. This is important given the paucity of social phobia research that has focused on behavioral observation in clinical samples. Second, these findings suggest that verbal behavior may be more important than nonverbal behavior in distinguishing those with social phobia. For the most part, differences between those with and without social phobia were better detected using verbal rather than nonverbal behavioral measures. Third, these findings offer some description of what it may be like to interact with someone suffering from social phobia. They may be expected to behave in a way that is more passive—less cooperative and less dominant—while not overtly submissive or escapist. This includes a failure to directly face people with whom they interact. In addition, it is atypical for persons with social phobia to make normal use of verbal dominance behaviors like commands and bragging.

Future research on social phobia should make greater use of measures of verbal behavior. Given that cognitive conceptualizations of social anxiety may be lacking in this regard, verbal behavior could help bridge the gap between the behavior and the cognitions of social phobia. It is also recommended that future research on the behavior of social phobia include a greater breadth of social situations to facilitate understanding of how situational cues impact behavior. Finally, it may also be important to more closely study the behavior of the people who interact with people with social phobia. Given that any social interaction involves the behavior of at least two people, important information may be gained by studying the behavior associated with social phobia in the full context in which it occurs, namely, the behavior of the people with whom they choose to interact.

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Note

1. Unfortunately, diagnostic reliability data are unavailable. However, extensive measures were taken to ensure reliability, including careful training of ADIS-R interviewers and weekly reviews of each case by the project staff with all interviewers present. Any diagnostic questions were resolved by an additional telephone interview until a consensus diagnosis was reached. As part of a related project, ADIS-R interviewers were also interviewing individuals with possible dysthymia during the same period, which helped prevent a bias to assign a diagnosis of social phobia to anyone with psychopathology (as opposed to nonanxious controls). Finally, the second author supervised treatment for all of the social phobics. This extensive contact certainly would have revealed diagnostic errors, and none appeared.

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