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Differentiating Social Phobia from Shyness

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Abstract

To clarify the relationship between social phobia and shyness, this study examined the characteristics of highly shy persons with social phobia, highly shy persons without social phobia, and non-shy persons. Those with social phobia reported more symptomatology, more functional impairment, and a lower quality of life than those without social phobia. About one-third of the highly shy without social phobia reported no social fears, highlighting heterogeneity of the shy. The social phobia group reported similar levels of anxiety as the shy without social phobia during analogue conversation tasks, but they reported more anxiety during a speech task. The social phobia group performed less effectively across tasks than those without social phobia. All groups' perceptions of anxiety and effectiveness during behavioral tasks were consistent with ratings of independent observers. None of the groups differed on psychophysiological measures. Results are discussed in the context of theoretical models of social phobia.

Keywords

social phobia; social anxiety disorder; shyness; anxiety

1. Introduction

From the time social phobia was introduced as a psychiatric disorder in the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition* in 1980 (DSM-III; APA, 1980), researchers and clinicians have theorized about the relationship between social phobia and shyness. Social phobia is a well-defined clinical disorder in the DSM-IV (APA, 1994), whereas shyness is a less well-defined lay term (Harris, 1984). The defining features of both are strikingly similar, however, and include somatic symptoms (e.g., trembling, sweating, blushing), cognitive symptoms (e.g., fear of negative evaluation), and behavioral symptoms (e.g., avoidance of social situations). Despite these shared features, the relationship between social phobia and shyness remains unclear. Furthermore, shyness is a condition many view as

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¹This paper is dedicated to Samuel M. Turner, Ph.D. whose untimely death cut short his dedication to understanding the etiology and treatment of anxiety disorders to improve the lives of so many.

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a normal personality trait that should not be confused with social phobia (see Carducci, 1999; Stein, 1996).

One hypothesis about the relationship between shyness and social phobia places both conditions on a continuum or spectrum with social phobia conceptualized as “extreme shyness” (Marshall & Lipsett, 1994; McNeil, 2001; Stein, 1999). Accordingly, those with social phobia have more severe symptoms and are more impaired by their discomfort in social situations than shy persons. This conceptualization is consistent with the notion that shyness is a subclinical condition or a normal facet of personality that is not pathological (Carducci, 1999). The second hypothesis is that shyness and social phobia are partly overlapping conditions, with shyness being a broader construct than social phobia (Beidel & Turner, 1999; Heckelman & Schneier, 1995; Heiser, Turner, & Beidel, 2003). According to this hypothesis, shyness and social phobia may be qualitatively different in some regards, rather than varying only in degree.

Some empirical investigations have begun to define the boundary between shyness and social phobia. In one study (Chavira, Stein, & Malcarne, 2002), rate of social phobia was significantly higher among a highly shy sample compared to a normative shy sample, providing partial support for the continuum hypothesis. However, only half of the highly shy persons in the study had generalized social phobia, lower than would be expected based on a continuum model. Similarly, when rates of social phobia and other psychiatric disorders were examined among a population who self-identified as shy (Heiser, Turner, & Beidel, 2003), shyness was associated with psychopathology in general and not solely with social phobia. In addition, a significant proportion of shy persons had no psychiatric diagnoses.

Both prior studies suggest that higher levels of shyness are associated with increasing rates of social phobia, but that the conditions are not the same. Both studies also suggest that the relationship between shyness and social phobia is limited to those with generalized social phobia, with little to no association between shyness and specific social phobia. This finding is consistent with clinical observations of persons with speech anxiety, for example, who do not appear to be shy or report being shy and of persons with generalized social phobia who typically report that they “have always been shy” (Beidel & Turner, 1998; Turner, Beidel, & Townsley, 1990).

In summary, past research indicates that, although shyness and social phobia are related, most shy persons do not meet criteria for social phobia. The pertinent question becomes: are there dimensions that distinguish the subset of highly shy persons with generalized social phobia from other highly shy persons who do not meet criteria for social phobia? The purpose of this study was to determine what factors, if any, discriminate generalized social phobia from shyness, restricting the analysis to highly shy individuals. Because shyness has been shown to be associated with multiple psychological problems, the shy group in this study consisted of those without psychiatric diagnoses so that comparisons between a “purely” shy group and those with social phobia could be made.

2. Methods

2.1 Participants

The sample for this study consisted of 78 individuals. Most of the participants ($n = 61$; 78.2%) were students at the University of Maryland, College Park who were enrolled in introductory psychology courses. The other 17 participants were recruited from persons seeking participation in a social phobia treatment study being conducted at the Maryland Center for Anxiety Disorders at the University of Maryland, College Park. Ten of these treatment seeking participants were also students at the University of Maryland, College Park. The other seven

were members of the general community. The sample consisted of 34 women (43.6%) and 44 men (56.4%). Their ages ranged from 18 to 41, with a mean age of 20.7 years ($SD = 4.3$ years). Of the 78 participants, 64.1% were Caucasian, 14.1% were Asian, 14.1% were African American, 5.1% were Hispanic, and 2.6% were of other racial and ethnic groups.

The sample included highly shy persons with generalized social phobia ($n = 25$), highly shy persons without generalized social phobia or other psychiatric diagnoses ($n = 26$), and non-shy persons without psychiatric diagnoses ($n = 27$). For ease of presentation, these groups are referred to hereafter as the social phobia group, the shy group, and the non-shy group, respectively. Shyness was assessed using the 13-item Revised Cheek and Buss Shyness scale, where scores can range from 13 to 65 (RCBS; Cheek, 1983; Hopko, Stowell, Jones, Armento, & Cheek, 2005). Psychiatric diagnoses were determined through use of a structured or semi-structured interview schedule. Specifically, participants recruited from introductory psychology courses were assessed with the Composite International Diagnostic Interview-Automated, Version 2.1 (CIDI-Auto; World Health Organization, 1993), a fully structured diagnostic interview that was self-administered on a computer. Adequate psychometric properties of the CIDI have been established (Andrews & Peters, 1998; Blanchard & Brown, 1998; Peters & Andrews, 1995; Peters, Clark, & Carroll, 1998; Wittchen, 1994). In addition, validity of the CIDI with a similar study sample was established in a prior study on shyness and social phobia (Heiser, Turner, & Beidel, 2003). Participants recruited from the social phobia treatment study at the Maryland Center for Anxiety Disorders were assessed with the Anxiety Disorders Interview Schedule for DSM-IV, a clinician-administered, semi-structured interview (ADIS-IV; Di Nardo, Brown, & Barlow, 1995). Information on social fears, social avoidance, and physical symptoms was gathered via these interview schedules.

Participants were included in the social phobia group if they met DSM-IV criteria for generalized social phobia. Seven of the individuals with social phobia (28.0%) had additional psychiatric diagnoses. Specifically, one participant had a comorbid diagnosis of Major Depressive Disorder (MDD); three participants had a comorbid diagnosis of Generalized Anxiety Disorder (GAD); one participant had a diagnosis of GAD and Substance Abuse; one participant had a diagnosis of MDD and Substance Abuse; and one participant had comorbid diagnoses of GAD, Dysthymia, and Substance Abuse. Participants in the other two groups were only included if they did not have psychiatric disorders.

2.2 Self-Report Measures

To assess negative social cognitions, the participants completed the Social Thoughts and Beliefs Scale, an empirically derived, 21-item, self-report inventory of maladaptive social cognitions (STABS; Turner, Johnson, Beidel, Heiser, & Lydiard, 2003). The Quality of Life Inventory (QOLI; Frisch, Cornell, Villanueva, & Retzlaff, 1992) was used to assess participants' perceptions of their well-being and satisfaction with life. The Liebowitz Self-Rated Disability Scale (LSRDS; Schneier et al., 1994) was used to assess impairment due to emotional problems, in this case social fears. To assess participants' preference for affiliation with others, the Cheek and Buss Sociability Scale, a five item self-report scale, was completed by participants (Cheek & Buss, 1981).

2.3 Physiological Assessment

Skin conductance and heart rate were monitored continuously throughout a series of behavioral assessment tasks using the Biopac MP100 Data Acquisition System. Biopac's AcqKnowledge 3.7 software was used to analyze the data. Heart rate was measured using the noninvasive NIBP100 for the first 25 participants. This device provides a measurement of heart rate via assessment of blood pressure. The device uses a wrist sensor that applies variable pressure directly above the radial artery, continuously measuring pulse pressure. Because calibration of

this device for each participant proved to be more time consuming than anticipated, for the remaining participants heart rate was measured using two pre-gelled disposable electrodes placed by the participant on his or her rib cage. For all participants, palmar sweat gland activity (skin conductance level) was measured in microSiemens with the Biopac GSR100C using a constant voltage method. Silver-silver chloride, unpolarizable, finger electrodes containing isotonic recording gel were placed on the participants' index and middle fingers of the non-dominant hand. One ground was placed on the lower arm.

3. Procedures

3.1 Participant Recruitment

The shyness scale (the RCBS) was completed by 1,303 introductory psychology students. The mean score was 33.0 ($SD = 9.5$). Students with a shyness score equal to one standard deviation above or below the mean (scores of 24 and below and 43 and above) were eligible to participate in the study. Students were informed of their eligibility for the study by electronic mail and if interested, they volunteered for the study using an electronic system. Informed consent was obtained from all participants prior to the start of the study. The participants then completed the CIDI-Auto on a computer in a private room. Participants who met criteria for one of the three groups based on their diagnostic status then participated in the behavioral assessment tasks and completed the self-report measures.

Seventeen participants, ten of whom were students at the University of Maryland, were recruited from a social phobia treatment study being conducted at the Maryland Center for Anxiety Disorders. The study recruited participants through newspaper and radio advertisements. Individuals who responded to the advertisements and were appropriate for the treatment study came to the Maryland Center for Anxiety Disorders for an assessment. Individuals who met criteria for generalized social phobia using the ADIS-IV were invited to participate in this study in addition to the treatment study. Participants completed the consent process for this study and then participated in the study as described above.

3.2 Behavioral Assessment Tasks

A series of behavioral tasks assessed participants' anxiety and social skill. Prior to the behavioral tasks, baseline levels of physiological arousal were assessed during a five minute resting period. Participants rated their distress during the baseline period using a Subjective Units of Distress Scale (SUDS) that ranged from zero to eight, with zero being no anxiety and eight being intense anxiety. Heart rate and skin conductance levels were recorded continuously during the baseline and the behavioral assessment tasks. After the baseline period, participants engaged in two unstructured three minute conversation tasks, one with an opposite sex confederate and one with a same sex confederate. Confederates were trained to remain neutral during the interaction, leaving the conversation burden to the participant. After these tasks, participants rated their distress using the SUDS scale. In addition, they provided ratings of perceived anxiety and effectiveness using Likert scales.

After the conversation tasks, participants engaged in an impromptu speech task. The participants selected three topics from among a list of five potential topics and had three minutes to prepare for the speech. Participants then delivered a five minute speech. The two confederates and the experimenter served as the audience. At the end of the task, participants provided a SUDS rating and ratings of their perceived anxiety and effectiveness using the Likert scales. The participants then completed the self-report measures.

The behavioral tasks were videotaped and rated by independent raters who were unaware of group status. Raters used Likert scales similar to those completed by the participants and to

those used in previous assessments of skill and anxiety during similar tasks (Turner, Beidel, Cooley, Woody, & Messer, 1994; Turner, Beidel, Dancu, & Keys, 1986). The Social Performance Rating Scale (SPRS; Fydrich, Chambless, Perry, Buergener, & Beazley, 1998) was used by independent raters to assess micro-level variables of the participants' performance during the behavioral assessment tasks (e.g., conversation flow, voice quality, gaze, discomfort, and length of response). The raters were trained so that interrater reliability was .80 with the experimenter on all variables. Twenty-five percent of the behavioral assessments were rated by two trained raters to assess interrater reliability, which was .80 or higher for all variables.

4. Results

4.1 Demographic Characteristics

Comparisons of demographic characteristics across the three groups were conducted. No significant relationship was found between group membership and sex ($\chi^2(2, N = 78) = 4.57, p > .05$). The percentage of females was 40.0% in the social phobia group, 30.8% in the shy group, and 59.3% in the non-shy group. There was a significant relationship, however, between group membership and race/ethnicity ($\chi^2(2, N = 78) = 8.57, p < .05$). Slightly over half (57.7%) of the shy group was non-white, compared to 29.6% of the non-shy group and 20.0% of the social phobia group. Similarly, age was significantly related to group membership ($F(2, 75) = 10.98, p < .05, \eta^2 = .226$). Bonferroni-adjusted pairwise comparisons revealed that those in the social phobia group were significantly older than those in the other two groups (social phobia: $M = 23.6$ years, $SD = 6.4$; shy: $M = 19.5$ years, $SD = 1.9$; non-shy: $M = 19.1$ years, $SD = 1.3$). The shy and non-shy groups did not differ in terms of age. In subsequent analyses, group differences in age and race/ethnicity were controlled statistically. Race/ethnicity and age were not significant covariates unless specifically noted. An alpha level of .05 was used for all statistical tests.

4.2 Shyness

The mean score on the shyness scale for the total sample ($N = 78$) was 39.1 ($SD = 14.9$). Based on a one-way analysis of covariance (ANCOVA) controlling for age and race/ethnicity, mean RCBS scores for the three groups were significantly different ($F(2, 73) = 413.33, p < .05, \eta^2 = .919$). Bonferroni-adjusted pairwise comparisons revealed that the social phobia group had significantly higher shyness scores ($M = 51.7, SD = 4.9$) than the shy group ($M = 47.2, SD = 4.5$), and that both of these groups had significantly higher shyness scores than the non-shy group ($M = 19.7, SD = 3.1$). The mean shyness score among the shy group was at the 93rd percentile of the recruitment sample, indicating successful recruitment of this group from the pool of eligible participants.

4.3 Symptomatology

Key symptoms of social phobia were examined among the three groups in the study (Table 1). The core feature of social phobia is a marked and persistent fear of social situations. All other DSM-IV criteria for the diagnosis rest on the presence of social fears. By definition, all of those with social phobia in the present study reported having social fears. Among the shy group, however, only 65.4% reported having social fears. Thus, about one-third (34.6%) denied presence of social fears despite their high levels of self-reported shyness. Because they did not endorse the presence of any social fears, they did not meet criteria for social phobia. Among the non-shy group, 25.9% reported social fears, with the majority reporting a fear of public

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speaking. Common fears reported by the shy and social phobia groups were fear of participating in conversations, meetings or classes, and parties, and fear of public speaking.

Another diagnostic feature of social phobia is the avoidance of feared social situations. Among the social phobia group, almost all (96.0%) reported that they avoid social situations they fear. Among the shy group, half (50.0%) reported that they avoid feared social situations. When examining only the shy who reported social fears, the majority (76.5%) reported avoidance of feared social situations. Among the social phobia and shy groups, the most common situations avoided were conversations, public speaking, meetings/classes, and parties. A small proportion of the non-shy group (7.4%) reported avoidant behaviors in response to social fears, primarily avoidance of public speaking.

With respect to somatic symptoms, 100% of the social phobia group reported their presence when encountering a feared social situation. Commonly reported symptoms included racing heart, sweating, stomach upset, blushing and trembling. Among the shy group, 65.4% reported somatic symptoms when encountering feared social situations, most commonly racing heart, blushing, sweating, and stomach upset. About one-fifth (22.2%) of the non-shy group reported somatic symptoms, primarily racing heart and blushing.

A between-subjects multivariate analysis of covariance (MANCOVA) examined group differences in the average number of feared social situations, avoided social situations, and somatic symptoms. The results indicated a significant main effect for group membership ($F(6, 144) = 11.38, p < .05, \eta^2 = .322$). Univariate ANCOVAs revealed that each of the dependent variables was significantly related to group membership (Table 2). Pairwise comparisons using the Bonferroni correction revealed that those with social phobia reported more social fears, avoidance of social situations, and somatic symptoms than the shy group, which in turn reported more of these symptoms than the non-shy group.

4.4 Negative Social Cognitions and Sociability

A between-subjects MANCOVA examining group differences on negative social cognitions and sociability revealed a significant main effect for group ($F(4, 140) = 22.22, p < .05, \eta^2 = .388$). Univariate ANCOVAs revealed that both dependent variables were significantly related to group membership (negative cognitions: $F(2, 70) = 84.80, p < .05, \eta^2 = .708$; sociability: $F(2, 70) = 18.15, p < .05, \eta^2 = .341$). Pairwise comparisons (Bonferroni correction) indicated that all groups differed significantly on the measure of negative cognitions, with the social phobia group reporting the highest level ($M = 53.5, SD = 11.1$), followed by the shy group ($M = 36.1, SD = 13.2$), and then the non-shy group ($M = 9.9, SD = 6.8$). The social phobia and shy groups reported similar levels of sociability (social phobia: $M = 15.3, SD = 4.2$; shy: $M = 16.1, SD = 3.1$), which were significantly lower than that reported by the non-shy group ($M = 21.6, SD = 3.2$).

4.5 Functional Impairment and Quality of Life

A between-subjects MANCOVA revealed a significant main effect for group on measures of impairment in functioning and quality of life ($F(4, 146) = 12.81, p < .05, \eta^2 = .260$). Univariate ANCOVAs revealed that both dependent variables were significantly related to group membership (functional impairment: $F(2, 73) = 23.21, p < .05, \eta^2 = .389$; quality of life: $F(2, 73) = 28.76, p < .05, \eta^2 = .441$). Pairwise comparisons (Bonferroni correction) indicated significant differences across all three groups. The social phobia group reported the lowest level of quality of life ($M = 0.6, SD = 1.2$), followed by the shy group ($M = 2.0, SD = 1.1$), and then the non-shy group ($M = 3.3, SD = 1.1$). The social phobia group reported a higher level of functional impairment ($M = 14.3, SD = 7.8$) than the shy ($M = 6.0, SD = 7.0$) and non-shy

groups ($M = 1.6$, $SD = 2.0$); the shy and non-shy groups did not differ significantly from each other.

4.6 Anxiety and Effectiveness in Behavioral Assessment Tasks

4.6.1 Subjective Anxiety—A repeated measures MANCOVA examined group differences on the Subjective Units of Distress scale (SUDS) across baseline and the behavioral assessment tasks (Table 3). There was no significant main effect for task. The main effect for group was significant ($F(2, 72) = 26.09$, $p < .05$, $\eta^2 = .420$) as was the task by group interaction effect ($F(6, 216) = 3.49$, $p < .05$, $\eta^2 = .088$). Bonferroni adjusted pairwise comparisons revealed that the social phobia and shy groups reported similar ratings of anxiety for the baseline and the conversation tasks and their ratings were significantly higher than those of the non-shy group. For the speech task, however, the social phobia group reported significantly higher anxiety than the shy group, which in turn reported significantly higher anxiety than the non-shy group.

4.6.2 Ratings of Effectiveness and Anxiety—In addition to the anxiety ratings reported above, both participants and independent observers completed ratings of anxiety and effectiveness for the behavioral tasks. A repeated measures MANCOVA was used to evaluate the effect of the rater (i.e., self versus independent observer as a within-subjects factor), the task (i.e., conversation tasks and speech task as a within-subjects factor), and group (between subjects factor) on anxiety and effectiveness ratings (Table 4). Only the main effect for group was significant ($F(4, 128) = 7.71$, $p < .05$, $\eta^2 = .194$). Univariate analyses indicated significant group effects for both anxiety and effectiveness (anxiety: $F(2, 64) = 18.58$, $p < .05$, $\eta^2 = .367$; effectiveness: $F(2, 64) = 16.55$, $p < .05$, $\eta^2 = .341$). Bonferroni-adjusted pairwise comparisons revealed that the social phobia and shy groups were rated as equally anxious (across raters and tasks); both groups were also rated as significantly more anxious than the non-shy group. For effectiveness, the social phobia group was rated as least effective (across raters and tasks), followed by the shy group and then the non-shy group.

4.6.3 Ratings of Specific Behaviors—Independent observers rated participants' specific behaviors (i.e., gaze, voice quality, length of responses, discomfort, and flow) during the behavioral tasks. A between-subjects MANCOVA for ratings of molecular-level behaviors during the conversation tasks indicated that there was a significant main effect for group ($F(10, 122) = 3.84$, $p < .05$, $\eta^2 = .239$). Univariate ANCOVAs revealed significant group effects for each dependent variable (Table 5). Bonferroni-adjusted pairwise comparisons indicated that the social phobia and shy groups had significantly poorer voice quality and higher levels of discomfort compared to the non-shy group. The social phobia group also had significantly poorer facial gaze, conversation flow, and length of responses compared to the non-shy group. The shy group did not differ significantly on these measures from either the social phobia or non-shy groups.

A between-subjects MANCOVA on ratings of three behaviors relevant to the speech task (gaze, voice quality, and discomfort) indicated a significant main effect for group ($F(6, 128) = 2.93$, $p < .05$, $\eta^2 = .121$). Each follow-up univariate ANCOVA was statistically significant. Based on Bonferroni-adjusted pairwise comparisons, the social phobia and shy groups had significantly poorer facial gaze and voice quality during the speech task compared to the non-shy group. The social phobia group exhibited significantly more discomfort (e.g., rigidity, fidgeting) than the non-shy group; the shy group did not differ significantly from the other two groups on this measure. The covariate age was significant for facial gaze and voice quality, with older participants having better gaze and voice quality.

4.7 Physiological Reactivity during Behavioral Assessment Tasks

As noted previously, two methods were used to measure heart rate. An analysis of heart rate data revealed that heart rate did not differ significantly between the two methods for baseline, the conversation tasks, or the speech task (baseline: $t(70) = 1.90$, $p > .05$; opposite sex conversation task: $t(72) = 1.84$, $p > .05$; same sex conversation task: $t(72) = 1.88$, $p > .05$; speech task: $t(69) = 0.52$, $p > .05$). Thus the data were combined. A repeated measures MANCOVA evaluated the effect of task (i.e., baseline, conversation tasks, and speech) and group on heart rate and skin conductance levels (Table 6). None of the main or interaction effects was significant.

5. Discussion

This study was designed to better understand the relationship between shyness and social phobia. Some researchers have hypothesized that these conditions rest on a continuum with social phobia being conceptualized as “extreme shyness” (e.g., Marshall & Lipsett, 1994; McNeil, 2001; Stein, 1999), while others have suggested that the conditions are overlapping, with shyness being a broader, more heterogeneous category (e.g., Beidel & Turner, 1999; Heckelman & Schneier, 1995; Heiser, Turner, & Beidel, 2003). Former studies have indicated that many highly shy persons do not meet criteria for social phobia (Chavira, Stein, & Malcarne, 2002; Heiser, Turner, & Beidel, 2003). This study extends prior research by comparing highly shy persons with and without generalized social phobia across various dimensions, including symptomatology, daily functioning, and quality of life, as well as social skill, anxiety, and psychophysiology during simulated conversation and performance tasks.

With respect to what might be considered “core” features of the two conditions, the social phobia group reported a significantly greater number of social fears, avoidance of social situations, negative thoughts, and somatic symptoms than the shy group, which in turn, reported more symptoms than the non-shy group. Prior studies suggested that specific clusters of symptoms may be more prevalent among the shy compared to those with social phobia. For example, Carducci, Hutzler, Morrison, and Weyer (2001) reported that shyness had more conceptual similarity with social phobia on the affective dimension (i.e., fear and anxiety), and less so on the behavioral dimension (i.e., avoidance) in their study. In the present study, however, all symptom clusters were more prevalent among the social phobia group relative to the shy group. The shy group also reported less functional impairment in their daily lives and a higher quality of life than those with social phobia. These data are consistent with prior studies of social phobia (Amies, Gelder, & Shaw, 1983; Liebowitz, Gorman, Fyer, & Klein, 1985; Schneier et al., 1994; Stein & Kean, 2000; Stein, McQuaid, Laffaye, & McCahill, 1999; Turner et al., 1986; Wittchen & Beloch, 1996), but this study is the first to include a shy, non-phobic comparison group. These overall findings are consistent with the hypothesis that the shyness and social phobia rest on a continuum.

However, a closer look at reported social fears revealed that, while all of those with social phobia reported social fears, a necessary criterion for the disorder, the shy group was much more heterogeneous. Specifically, one-third of the highly shy group without social phobia did not report *any* social fears during the diagnostic interview (i.e., the CIDI). Thus, although they reported high levels of shyness on the shyness inventory (i.e., the RCBS), they denied having a fear of specific social situations on the CIDI. The RCBS is a dimensional measure which asks participants to rate how characteristic a statement is of them (e.g., “I feel inhibited in social situations.”) on a scale of 1 to 5. The CIDI, on the other hand, asks respondents for a positive or negative response to being anxious or afraid in social situations and inquires about commonly feared situations. Although these differences in methodology and terminology may partly explain these discrepant findings, it is unlikely that they explain them fully. Thus, the shy participants without social phobia who did not report any social fears or meet any diagnostic

criteria for social phobia appear to be qualitatively different from their counterparts. This finding provides partial support for the hypothesis that the two conditions are overlapping but different conditions, with the shy being a more heterogeneous group.

One possible distinction between the two groups is that the shy population includes individuals who are not fearful of social situations, but rather are reserved and prefer to be alone (Zimbardo, 1977). These individuals would be low on the dimension of sociability, which has been shown to be related to but unique from shyness (Bruch, Gorsky, Collins, & Berger, 1989; Cheek & Buss, 1981). In this study, the shy and social phobia groups did not differ on self-reported sociability, although both reported lower levels than the non-shy group. Given that sociability is not a distinguishing factor, it remains unclear why such a large proportion of shy individuals did not endorse social fears while others reported multiple, non-circumscribed fears. This key finding highlights heterogeneity of the shy population.

This study included a series of behavioral assessment tasks designed to directly examine anxiety and social behaviors in conversation and performance situations. Participants and independent observers rated anxiety and skill during these tasks. The extant literature documents that persons with social phobia experience more anxiety and do not perform as well as non-anxious persons in social and performance situations (Alden & Wallace, 1995; Hofmann, Gerlach, Wender, & Roth, 1997; Hofmann, Neuman, Ehlers, & Roth, 1995; Juster, Heimberg, & Holt, 1996). In this study, the shy and social phobia groups reported similar anticipatory anxiety prior to the behavioral assessment tasks and similar anxiety levels during the conversation tasks. The social phobia group, however, reported higher levels of anxiety during the speech task. For both tasks, the social phobia group was not as effective as the shy group and both groups were less effective than the non-shy group. For molecular-level variables (e.g., facial gaze), the social phobia group exhibited more skill deficits than the shy group across tasks.

Results from the behavioral tasks suggest that shy persons are more skilled in general in social situations than those with social phobia, and less anxious in more formal situations, such as speeches. Although the shy were equally anxious as those with social phobia during more informal social tasks (e.g., conversations), they performed better despite their anxiety. These findings may account in part for group differences in reported functional impairment and quality of life.

Past research has found that persons with social phobia rate their own performance in behavioral tasks more poorly than independent observers (Alden & Wallace, 1995; Rapee & Lim, 1992), supporting the hypothesis that persons with this disorder have a negative cognitive bias regarding their own performance (Clark & Wells, 1995; Rapee & Heimberg, 1997). In the current study, the tendency to underestimate one's performance or overestimate one's anxiety was not found among any group. The participants' ratings of their performance and anxiety during behavioral tasks were consistent with those of independent raters across groups and tasks.

Despite group differences during the behavioral tasks on subjective distress, these differences were not reflected in the psychophysiological measures used in this study. Our findings are consistent with those of another investigation by Edelmann and Baker (2002), who reported that persons with social phobia, other anxiety patients, and non-anxious persons did not differ on any physiological measures recorded during various behavioral tasks, including a baseline and a conversation task. In addition, they found that those with social phobia inaccurately rated their bodily sensations (heart rate and sweating), perceiving more arousal than objectively measured. The inconsistency between self-reported somatic symptoms and actual physiological responses has long been noted (Lang, 1978) and perhaps explains the lack of

differences in heart rate and skin conductance in this study despite significant differences in subjective distress. Yet another possibility is that the tasks typically used in these studies require significant effort and energy of all participants, such as voice projection and gesturing, and that this cardiovascular response may mask differences between groups (McNeil, Ries, & Turk, 1995). In addition, in this study only the tonic dimension of heart rate and skin conductance was examined; results may have been different if phasic arousal was examined both for event-related changes and spontaneous fluctuations. Finally, the tasks were analogue tasks which may have affected participants' behavior and responses.

Results of this study provide partial support for both the continuum hypothesis and the shyness heterogeneity hypothesis. The overall pattern of results, with the social phobia group reporting more symptomatology, more impairment, and more social skills deficits supports the continuum model. However, the unexpected finding of a subgroup of highly shy persons without social fears is not well explained by the continuum model. This group appears to be quite large and qualitatively different from those with social phobia lending support for the hypothesis that shyness is a broader, more heterogeneous construct than social phobia. The nature of social fears if any among this group remains unclear and in need of further research. The shy group overall appears to experience fewer symptoms and less impairment than those with social phobia. Future research should focus on factors that may "protect" the highly shy without social phobia from the debilitating effects social anxiety. Based on this study, possible factors include differences in the nature of social fears, a less intense experience or interpretation of somatic symptoms and anxiety, and more social skill during conversational and performance tasks.

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Table 1
Presence of Social Fears, Social Avoidance, and Somatic Symptoms

Variable	Social Phobia (n = 25)		Shy (n = 26)		Non-Shy (n = 27)		Chi-Square Statistic
	#	%	#	%	#	%	
Social Fears							
Any social fear	25	100.0	17	65.4	7	25.9	$\chi^2(2, N = 78) = 30.61, p < .05$
No social fears	0	0.0	9	34.6	20	74.1	$\chi^2(2, N = 78) = 30.61, p < .05$
Parties	20	80.0	10	38.5	0	0.0	$\chi^2(2, N = 78) = 35.10, p < .05$
Conversations	25	100.0	12	46.2	1	3.7	$\chi^2(2, N = 78) = 48.28, p < .05$
Meetings/classes	21	84.0	11	42.3	1	3.7	$\chi^2(2, N = 78) = 34.29, p < .05$
Formal speaking	25	100.0	11	42.3	5	18.5	$\chi^2(2, N = 78) = 36.21, p < .05$
Eating in public	8	32.0	2	7.7	0	0.0	N/A ^d
Writing in public	4	16.0	3	11.5	0	0.0	N/A ^d
Social Avoidance							
Any avoidance	24	96.0	13	50.0	2	7.4	$\chi^2(2, N = 78) = 40.75, p < .05$
Parties	19	76.0	8	30.8	0	0.0	$\chi^2(2, N = 78) = 33.38, p < .05$
Conversations	20	80.0	8	30.8	0	0.0	$\chi^2(2, N = 78) = 36.55, p < .05$
Meetings/classes	14	56.0	5	19.2	0	0.0	$\chi^2(2, N = 78) = 22.65, p < .05$
Formal speaking	17	68.0	5	19.2	1	3.7	$\chi^2(2, N = 78) = 27.78, p < .05$
Eating in public	5	20.0	1	3.8	0	0.0	N/A ^d
Writing in public	2	8.0	1	3.8	0	0.0	N/A ^d
Somatic Symptoms							
Any symptom	25	100.0	17	65.4	6	22.2	$\chi^2(2, N = 78) = 33.42, p < .05$
Racing heart	25	100.0	13	50.0	6	22.2	$\chi^2(2, N = 78) = 32.59, p < .05$
Sweating	23	92.0	10	38.5	2	7.4	$\chi^2(2, N = 78) = 38.20, p < .05$
Stomach upset	12	48.0	4	15.4	0	0.0	$\chi^2(2, N = 78) = 18.97, p < .05$
Blushing	18	72.0	12	46.2	6	22.2	$\chi^2(2, N = 78) = 12.94, p < .05$
Trembling	13	52.0	2	7.7	3	11.1	$\chi^2(2, N = 78) = 17.43, p < .05$
Other	9	36.0	2	7.7	0	0.0	N/A ^d

^aExpected cell frequencies are too small to support a reliable chi-square test.

Table 2

Average Measures of Symptomatology

Variable	Social phobia (<i>n</i> = 25)		Shy (<i>n</i> = 26)		Non-Shy (<i>n</i> = 27)		One-way ANCOVA	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Social fears	4.1	0.8	1.9	1.8	0.3	0.5	$F(2, 73) = 47.85, p < .05$	.567
Situations avoided	3.1	1.2	1.1	1.4	0.0	0.3	$F(2, 73) = 37.47, p < .05$	.507
Somatic symptoms	3.7	1.0	1.6	1.5	0.6	1.2	$F(2, 73) = 29.01, p < .05$	.443

Table 3

Subjective Units of Distress (SUDS) by Task

SUDS ^a	Social phobia (n = 24)		Shy (n = 26)		Non-Shy (n = 27)	
	M	SD	M	SD	M	SD
Baseline	3.5	1.7	3.1	1.7	1.6	1.5
Opposite Sex Conversation	5.0	1.5	3.6	1.9	1.7	1.5
Same Sex Conversation	5.0	1.3	3.8	2.1	1.6	1.5
Speech	6.5	1.7	4.3	2.1	2.4	2.0

^a SUDS ratings range from zero (no anxiety) to 8 (intense anxiety).

Table 4

Anxiety and Effectiveness Ratings by Task and Rater

Variable	Social phobia (<i>n</i> = 19)		Shy (<i>n</i> = 23)		Non-Shy (<i>n</i> = 27)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Anxiety ^a						
Conversation Tasks						
Self ratings	2.9	0.6	4.1	1.2	5.3	1.3
Independent ratings	3.5	1.1	4.2	1.2	5.2	1.2
Speech						
Self ratings	2.9	1.0	3.8	1.4	5.2	1.5
Independent ratings	3.7	1.6	4.5	1.5	5.2	1.5
Effectiveness ^b						
Conversation Tasks						
Self ratings	3.8	0.8	4.6	0.9	5.7	1.1
Independent ratings	4.1	1.0	4.7	1.0	5.4	1.1
Speech						
Self ratings	3.4	1.2	4.3	1.2	5.4	1.2
Independent ratings	4.3	1.4	5.1	1.2	5.3	1.4

^a Anxiety ratings range from 1 (extremely anxious) to 7 (very comfortable).

^b Effectiveness ratings range from 1 (not at all effective) to 7 (very effective).

Table 5

Ratings of Molecular-Level Behaviors by Task

Variable ^b	Social phobia ^a		Shy (<i>n</i> = 23)		Non-Shy (<i>n</i> = 27)		One-way ANCOVA	η ²
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Conversation Tasks								
Gaze	3.6	1.2	4.1	0.8	4.2	0.9	<i>F</i> (2, 64) = 4.21, <i>p</i> < .05	.116
Voice Quality	3.4	1.2	3.6	0.9	4.3	0.7	<i>F</i> (2, 64) = 9.63, <i>p</i> < .05	.231
Length	3.9	1.2	4.0	0.6	4.4	0.7	<i>F</i> (2, 64) = 3.66, <i>p</i> < .05	.103
Discomfort	3.0	1.1	3.3	0.8	3.9	0.9	<i>F</i> (2, 64) = 7.89, <i>p</i> < .05	.198
Flow	3.1	1.0	3.6	0.7	4.0	0.9	<i>F</i> (2, 64) = 8.48, <i>p</i> < .05	.209
Speech Task								
Gaze	3.3	1.3	3.2	1.0	3.9	1.0	<i>F</i> (2, 65) = 5.87, <i>p</i> < .05	.153
Voice Quality	3.5	1.1	3.6	0.9	4.3	0.7	<i>F</i> (2, 65) = 8.57, <i>p</i> < .05	.209
Discomfort	3.2	1.0	3.7	1.0	4.0	0.9	<i>F</i> (2, 65) = 4.54, <i>p</i> < .05	.123

^a *n*=19 for Role Plays; *n*=20 for Speech Task.

^b Ratings range from 1 (very poor) to 5 (very good); for discomfort, ratings range from 1 (very high) to 5 (very low).

Table 6

Heart Rate and Skin Conductance by Task

Variable	Social phobia (<i>n</i> = 20)		Shy (<i>n</i> = 25)		Non-Shy (<i>n</i> = 22)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Heart Rate (beats per minute)						
Baseline	78.7	12.9	78.5	12.4	81.2	11.1
Opposite Sex Conversation	82.4	14.1	84.5	12.8	85.7	8.8
Same Sex Conversation	81.6	13.4	83.5	13.3	82.7	10.2
Speech	86.5	13.7	84.5	13.6	87.3	10.9
Skin Conductance (microSiemens)						
Baseline	4.8	3.4	3.4	2.4	3.6	1.7
Opposite Sex Conversation	6.5	4.3	5.8	3.6	5.7	2.2
Same Sex Conversation	7.0	4.8	6.0	3.6	5.9	2.3
Speech	8.0	5.1	6.8	4.4	6.4	2.3