NONVERBAL SENSITIVITY
AS A FUNCTION OF SOCIAL ANXIETY

By

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Abstract

While clinical research has led to the development of treatment programs which have effectively reduced social anxiety in clinical and analogue populations, one of the major shortcomings in this area has been the lack of conceptual clarity. The present study attempted to elucidate the nature of the prevalent social problem in an investigation of the relation between sensitivity to nonverbal social cues and social anxiety. Twenty-four socially anxious women and 24 socially nonanxious women were selected from undergraduate classes on the basis of their scores on the Social Avoidance and Distress Scale (SAD). Moderately and severely depressed subjects were excluded from the study using the Beck Depression Inventory (BDI).

Upon their arrival at the laboratory, subjects interacted with a female confederate for 4 minutes. For one half of the interaction, the confederate displayed a relaxed demeanor. During the second interval, the confederate altered her behaviour to portray an anxious state. Subjects were randomly assigned to relaxed-anxious or anxious-relaxed conditions. Following the interaction, subjects rated their level of comfort and that of the confederate. In addition, subjects were asked to describe how the confederate responded to them during their conversation. The subsequent essays were coded by two independent judges. Subjects were also asked directly whether or not they perceived a change in the confederate's behaviour. The interactions were videotaped and each two minute interval was rated by two independent
judges along the following dimensions: observation, posturing, gestures, head nods, number of pauses and time spent talking. Judges also rated subjects on global measures of social skill and anxiety.

Multivariate analyses of covariance using depression as a covariate were used for data analysis. Based on Crozier's (1979) notion of anxious self-preoccupation it was predicted that socially anxious subjects would be less sensitive to changes in the nonverbal behaviour of the confederate compared to socially nonanxious subjects. Differential sensitivity across groups was not demonstrated. Significant differences between socially anxious and nonanxious subjects were not obtained on subjects' self-reports and only one of six interaction measures differentiated the two groups.

Findings were interpreted in light of the methodological limitations of the current study and in the context of the relevant research. The effect of statistically controlling for depression was discussed in relation to ancillary analyses which excluded this covariate. It was suggested that future research control for the potential confounding influence of depression when investigating social anxiety. Furthermore, it was recommended that sensitivity to vocal cues in relation to social anxiety could provide a fruitful avenue for experimental inquiry.
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The relation between social competence and psychiatric disorders is well established. In 1961, Zigler and Phillips provided data suggesting that premorbid level of social functioning was a good predictor of the adjustment of psychiatric patients following a period of hospitalization. Since then, a growing number of researchers have supported the notion of social skill deficits as a basis for major forms of psychopathology (Argyle and Kendon, 1967; Curran and Wessberg, 1981). Furthermore, social incompetence has been related to numerous other dysfunctional behaviours including alcohol abuse (Kraft, 1971), sexual problems (Barlow, 1973), drug addiction (Callner & Ross, 1976), and marital discord (Eisler, Miller, Hersen & Alford, 1974).

Research has also indicated that social incompetence represents a significant problem for college students. For example, dating problems are frequently accompanied by anxiety, depression and academic failure (Hopkins, Malleson and Sarnoff, 1958; Lucas, Kelvin and Ojha, 1966; Arkowitz, Hinton, Perl & Himadi, 1978). Martinson and Zerface (1970) reported that students were more interested in learning how to get along with the opposite sex than with receiving help in choosing a vacation or learning about their abilities, interests, intelligence and personalities.

The prevalence of social problems in college populations was investigated by Borkovec, Stone, O'Brien and Kaloupek (1974). They reported that 15.5% of males and 11.5% of females in introductory psychology experienced at least some fear of being with a member of the opposite sex and 32% of males and 38.5% of females experience at least
some fear of meeting someone for the first time. More recent surveys substantiate the finding that social problems, especially in heterosocial situations, are a major concern for a large proportion of college students (Galassi & Galassi, 1979). Zimbardo (1977) surveyed nearly 5,000 people including both college and noncollege populations. More than 80% of those questioned reported that they were "shy at some point in their lives" and 40% of this group described themselves as "presently shy."

The findings reviewed thus far underscore the importance of research into the nature and treatment of social incompetence. Social incompetence is a widespread problem that can interfere with daily functioning and may lead to serious life adjustment problems.

Over the course of the last fifteen years, there has been a growing interest in the development of treatment programs to increase the social functioning of socially incompetent college students and other nonpsychiatric populations (Curran, 1975; Rehm & Marston, 1968; Martinson & Zerface, 1970; Malkiewich and Merluzzi, 1980). Most of the treatment research may be categorized into one of three major theoretical formulations. The classical conditioning model states that social incompetence is the result of conditioned anxiety (Wolpe, 1973). According to this view, unpleasant social experiences are associated with various cues in social situations. Anxiety is then aroused when anticipating or responding to similar situations and results in poor performance, avoidance or escape. It is assumed that the problem can be eliminated by deconditioning the anxiety thus allowing for the
expression of more appropriate behaviours. Empirical evidence in
support of this conceptualization comes from studies demonstrating the
effectiveness of systematic desensitization in reducing social anxiety
(Bander et al, 1975; Mitchell & Orr, 1974; Fishman & Nawas, 1973). The
skill deficits model states that social incompetence is due to an
inadequate or inappropriate behavioural repertoire (Curran, 1977).
Limited social skills do not allow the individual to effectively handle
the demands of the situation. The consequence is poor social
performance and in some cases, anxiety, avoidance or escape. Social
skills trainings or response acquisition treatment programs exemplify
this model (Twentyman & McFall, 1975; Curran, Gilbert & Little, 1976;
MacDonald et al, 1975). Lastly, the cognitive-evaluative model
defines the source of social incompetence as the faulty appraisal of
one's performance and the expectation of negative consequences (Galassi
& Galassi, 1979). Because of negative self-evaluations, excessively
high performance standards, unrealistic expectations, irrational
beliefs, faulty perceptions or misinterpretation of feedback, socially
incompetent individuals perform poorly in social situations or avoid
them. Treatment programs based on this conceptualization have employed
strategies such as rational restructuring (Kanter & Goldfried, 1979) and
self-reinforcement (Rehm & Marston, 1968) to reduce the high level of
social anxiety experienced by socially incompetent individuals. While
these theoretical formulations are based on differing views, treatment
programs generated from these three perspectives have demonstrated their
efficacy in reducing targeted
problem areas in socially incompetent populations (Curran, 1977; Malkiewich & Merluzzi, 1980; Curran & Gilbert, 1975).

For many years, the majority of research on social incompetence focused on treatment methods. More recently, however (Curran, 1977; Hersen & Bellack, 1977), assessment issues have received an increasing amount of attention. Bellack (1983) uncovered 35 articles dealing with the assessment of social skills in adults published in behavioural journals and the Journal of Consulting and Clinical Psychology in 1980 and 1981. The current dilemma facing researchers and clinicians working in this area is summarized nicely by Curran and Wessberg (1981): "We have been struggling to deal with issues that, as yet, have not been defined or clarified" (p. 420). They concur with Hersen and Bellack's (1977) observation that most of the simple treatment-outcome studies have been done and that it is now time to do the more difficult assessment studies. Curran's (1979) explanation of this issue is poignantly recounted in an article entitled "Pandora's Box Reopened? The Assessment of Social Skills."

The term social incompetence used thus far was chosen arbitrarily. Researchers have used a variety of terms to refer to research in this area including social inadequacy, social dysfunction and social skills (Curran & Wessberg, 1981; Curran, 1979). While this difference in terminology adds some confusion when reading the literature, the same questions faces all researchers. What is social skill? What are the components of adequate social performance? As Curran (1979) stated, we cannot measure what we cannot define or more importantly as clinicians,
we cannot effectively treat that which we cannot measure accurately.

To summarize, research on social competence began with a focus on treatment-outcome studies. While treatment methods were found to be effective, definitional and assessment issues gradually came to the forefront in the literature (Curran, 1977). Over the last seven years, researchers have emphasized the importance of viewing social competence as a "megaconstruct" (Curran, 1979) and the necessity of developing more sophisticated methodologies to assess this construct properly (Bellack, 1983). Researchers have become keenly aware of the lack of conceptual integration in this area (Schlenker & Leary, 1982) and the urgency of refining our questions and assessment strategies in order to organize and interpret the large body of data that has accumulated (Curran & Wessberg, 1981).

Social Anxiety and Social Skill

Within the realm of assessment issues associated with research in this area, the concepts social skill and social anxiety are frequently referred to without sufficient clarification. Bellack (1979) reports that "the distinction between skill and anxiety and their interrelationship is not always clear in the literature" (p. 167). While in some studies both variables are assessed giving them equal weight in treatment-outcome and assessment research (Arkowitz et al., 1975; Schwartz & Gottman, 1976), in other cases anxiety is either not
assessed or examined only secondarily (Eisler et al., 1975; Bellack et al., 1976). Due to this inconsistency in the literature, statements regarding the relation between social anxiety and social skill must be made with caution.

Curran (1979) recommends that researchers be wary of the multiple etiological and maintaining factors of poor social performance in their assessment of social skills. He presents a minimodel of social performance in which social skills and interference mechanisms (conditioned anxiety or faulty cognitive-evaluative processes) are conceptualized as orthogonal constructs. Using a somewhat oversimplified conceptual framework, individuals are categorized in one of four ways: adequate social skills and no interference, adequate social skills and interference, inadequate social skills and no interference or inadequate skills and interference. For the purposes of the discussion that follows, it is important to underscore the fact that socially unskilled individuals may or may not be socially anxious and socially anxious individuals may or may not be socially unskilled. Furthermore, if the socially anxious individual displays skill deficits, these deficits may or may not be qualitatively different than those of the socially unskilled individual. For example, the socially anxious individual may know what to say and how to say it, but may be unable to do so as the result of an interference mechanism while the socially unskilled individual may lack the knowledge to respond appropriately. The remainder of this introduction will concentrate on the assessment of social anxiety, what researchers have determined thus far and current
trends in assessment research to further clarify this construct.

Assessment of Social Anxiety

Researchers' efforts to specify the components of social anxiety have generally focused on behavioural and/or cognitive indices. The bulk of this literature has placed almost exclusive emphasis on observable response dimensions including speech content, length of conversation, pauses, voice volume, rate of speech, pitch, tone, kinesics, eye contact and facial expression (Bellack & Morrison, 1982). Research findings indicate that while high and low socially anxious groups have been successfully differentiated based on judges' subjective global ratings of anxiety and skill (Bellack, 1979; Curran, 1977), specific, objective behavioural measures have yielded inconsistent results (Fischetti et al, 1977; Cacioppo et al., 1979).

In light of the failure of behavioural measures to differentiate contrasted groups of socially anxious individuals, researchers have focused a great deal of attention on methodological problems associated with the assessment of social skills (Bellack, 1979; Bellack, 1983; Curran, 1977; Curran, 1979; Wessberg et al, 1979; Bellack et al, 1979). Among the issues raised by these and other authors are the reliability, validity and utility of the predominant assessment strategies which include self-report inventories, in vivo observation, observation of staged or simulated naturalistic interactions and role play tests. On another level, researchers have become keenly aware of problems regarding the appropriateness of the behavioural units selected for the
measurement of social skills. While some studies have focused on global or molar skill categories, others have measured specific or molecular response components and still others have assessed both (Hersen & Bellack, 1976; Bellack, 1979). Given the potential complexity of personal, situational, cultural and interactional variables involved in the measurement of this construct (Curran & Wessberg, 1981), the importance of a multimethod-multilevel approach has become a major theme in the assessment literature. "Our knowledge of traditional psychometric techniques must increase as well as our degree of methodological sophistication" (Curran, 1979, p.59).

In addition to a heightened awareness of experimental design and the use of empirically validated assessment strategies, the lack of consistent behavioural differences between socially anxious and nonanxious individuals has resulted in the investigation of possible cognitive differences between these two groups. Smith and Sarason (1975) and O'Banion and Arkowitz (1977) found that socially anxious individuals recall more negative information and interpret negative feedback less favorably than do nonanxious individuals. Furthermore, they tend to underestimate their own performance and expect greater negative evaluations from others, although judges' ratings of skill may not differentiate high and low socially anxious groups (Clark and Arkowitz, 1975). Goldfried and Sobocinski (1975) and Gormally et al (1971) demonstrated that irrational beliefs were positively correlated with self-report measures of social anxiety. Consistent with these latter two studies, Smith et al (1983) provided evidence that socially
anxious individuals under social-evaluative threat experience increases in cognitive activity that reflects concern over the evaluation of others. Lastly, Cacioppo et al (1979) found that socially anxious men generated more negative self-statements while anticipating a conversation with an unfamiliar woman than their nonanxious counterparts. While the results of these studies do not provide definitive evidence regarding the casual role of cognitive responses in social anxiety, they strongly suggest that social anxiety has an important cognitive component. Based on this research Galassi and Galassi (1981) conclude that there is more evidence of a cognitive deficit associated with social anxiety than a behavioural deficit.

A third outgrowth of the failure to specify reliable behavioural indices of social anxiety has been a renewed interest by clinical researchers in the dynamic nature of social interaction. It has been suggested that simple frequency measures are not adequate to detect behavioural differences in social skill (Arkowitz et al. 1975). According to Fischetti et al (1977), frequency counts ignore the reciprocal nature of a social interaction, especially the synchronization of responses to a partner's behavioural cues. Given this increased awareness in the interactional characteristics of social interaction, a growing number of researchers are focusing on the importance of conducting more fine-grained analyses of response sequences in order to isolate the fundamental indices of social skill as well as the behavioural markers of social anxiety (Scott & Edelstein, 1981; Glasgow & Arkowitz, 1975).
By way of introduction to a discussion of the relevant clinical research, a few comments on the nature of social interaction appear warranted. While clinical researchers have primarily focused upon the intrapersonal deficits associated with social anxiety, social psychologists have brought to light the importance of interpersonal and contextual variables associated with effective social performance. In a comprehensive review of the experimental work on social performance, Argyle and Kendon (1967) present evidence to suggest that the patterning of action in time, paralinguistic features, visual orientation, bodily movement, facial expression and looking patterns are all important dimensions of a social encounter. These dimensions are said to reflect the complex and ever-changing nature of an interaction.

The terms "working consensus" (Goffman, 1959), "interactional synchrony" (Kendon, 1970), "traffic rules" (Goffman, 1955) and "rhetorical sensitivity" (Hart & Burks, 1972) stress the importance of assessing the interactional variables associated with effective social performance. The common theme underlying these terms is that of recognizing and responding to cues emitted by the other person in order to maintain a social interaction. According to Argyle and Kendon's (1967) sensorimotor model of social skill, the socially competent individual is one who continuously monitors the immediate situation and modifies his or her performance in light of continuous external feedback from the other person and internal criteria such as his or her desired goals.

In order to further understand the nature of social skill and the
relation between social skill and social anxiety, clinical researchers have broadened the scope of their investigations to incorporate the interactional perspective outlined above. One of the major proponents of this expansion is Trower (1979, 1980, 1982). According to this author, social incompetence can be accounted for in one of two ways. It may be the result of skill component deficits which include normative social behaviours (eye contact, gestures, greetings, partings, segments of discourse). Social incompetence may also be due to skill process deficits. Within this category, Trower (1980) includes both cognitive and perceptual deficits which may occur during the course of an interaction. Negative or unrealistic expectations, negative attributions, failure to monitor one's own behaviours or social cues in the immediate situation and failure to synchronize one's performance with the other person are all classified as skill process deficits.

Morrison and Bellack (1981) agree with Trower's (1980) expansion of the concept of social skill to encompass interactional or process components. They propose that social perception skill, the ability to accurately read the social environment, is an important dimension of social skill. "Regardless of the magnitude of response skill, the individual cannot perform effectively if he/she does not adequately receive and process the relevant interpersonal stimuli" (p. 70). Morrison and Bellack specify five components of social perception in social skill: (a) listening, or attending to the interpersonal partner, (b) getting clarification, or the ability to both perceive confusion and to appropriately seek elucidation from the interpersonal partner,
(c) relevance, or insuring that a response is related to the conversation as a whole, as well as to the immediately preceding communication, (d) timing, or the performance of responses at appropriate latency, and (e) perception of emotion. While these components are not identical to those suggested earlier, both Morrison and Bellack (1981) and Trower (1980) acknowledge the importance of cognitive and perceptual processes in their conceptualizations of social skill. In both cases, the importance of receiving, interpreting and responding to social cues emitted by the interpersonal partner is stressed. As such, these authors' recommendations that clinical investigations into the nature of social skill be expanded to incorporate interactional variables represent the assimilation of a large body of social psychological literature which has illuminated the fluctuating nature of social interactions.

In summary, the current trends in the assessment of social skill and the relation between social skill and social anxiety have developed as result of the failure of specific behavioural measures to reliably differentiate contrasted groups. Efforts to characterize these constructs have most recently focused on the interactional or process variables associated with social interaction. Social psychologists have emphasized the importance of monitoring and responding to social cues in order to maintain a social encounter. With this in mind, clinical researchers are beginning to investigate the validity of an interactional approach in the assessment of social skill and social anxiety in which sensitivity to social cues plays a central role.
Relevant Research

Fischetti et al (1977) examined the timing and placement of social responses in high and low heterosexual-socially anxious undergraduate males. Subjects were selected on the basis of behavioural ratings of their social anxiety and social skill as well as a self-report measure of heterosexual-social anxiety. Two socially competent groups and one socially incompetent group, each made up of twelve subjects, were used in the study. Subjects viewed a 10 minute prerecorded tape of a female speaker discussing personal and general aspects of her life and were asked to press a switch whenever they felt it was a good time to respond with a gesture and/or a vocal response. One of the socially competent groups served as the criterion for determining the intervals considered to be appropriate places to respond. Findings supported the original hypothesis: While the two groups of socially competent individuals did not differ from the group of socially incompetent individuals in their frequency of responses, there were significant differences in agreement over the placement or timing of their responses. Socially competent subjects tended to cluster their responses systematically whereas socially incompetent subjects tended to respond in a more random fashion. The authors concluded: "The data from this study point out the importance of expanding investigations into specific nature of social skill beyond the simple emission of behaviour to accurate placement of those behaviours and the ability to discriminate cues that may guide response synchronization" (p. 193).
Peterson et al (1981) used the same methodology to examine the timing and placement of social responses in heterosexual-socially anxious women and obtained similar, albeit weaker, findings than those of Fischetti et al (1977). The attenuated levels of significance were explained in terms of less contrasted groups and a lack of research regarding the social skills of women which necessitated the use of subject selection procedures primarily designed for and validated on men. The authors concluded, however, that their findings, in combination with those of Fischetti et al (1977), indicate the importance of response synchronization in the assessment of socially incompetent populations.

Trower (1980) investigated the components and processes of skilled and unskilled social behaviour in sixty patients referred for behaviour therapy or social skills training (see previous section for discussion of skill component deficits and skill process deficits). Patients were asked to participate in a laboratory-type social interaction test with one male and one female confederate. The female confederate systematically varied her speaking and attending behaviour during the first and second phases of the interaction, each phase lasting 4 minutes. The male role partner remained silent until the third phase at which time he displayed verbally aggressive and argumentative behaviours toward the patient. Dependent measures included speech, looking at other, smiling, communicative gestures and posture shifts. Skilled patients were found to speak, look, smile, gesture and change their posture more than unskilled patients. Furthermore, the skilled group
showed more variability in behaviour in response to situational changes. Trower concluded that unskilled patients are deficient not only in absolute levels of behaviour but in their pattern of behaviour as well.

Although these findings must be interpreted in the light of a select psychiatric population, Trower addressed two issues in this study that are of importance to researchers in the area. First, an attempt was made to empirically determine some of the essential elements of socially skilled behaviour. Second, the nature of social incompetence was investigated on a process or interactional level as well as in terms of specific behavioural components. Unlike the Fischetti et al (1977) and Peterson et al (1981) studies, Trower used a role-play situation to assess his skilled and unskilled groups, thus employing a measure more representative of social interaction.

Steffen and Reckman (1978) examined the selective perception and interpretation of interpersonal cues in 20 socially anxious and 20 nonanxious male undergraduates. They suggested that socially anxious individuals may be selectively attending to interpersonal cues and/or differentially interpreting such cues in social situations. Subjects were introduced to a female confederate and informed that their task was to get to know each other. Their interaction was video-taped and lasted for 6 minutes. In counterbalanced order across subjects, the confederate behaved positively for 3 minutes and negatively for 3 minutes. The dependent measures included: (a) a written description by the subject stating how his partner responded to him during their conversation and (b) a series of 7-point scales on which the subject
rated the frequency with which the confederate smiled, looked at him, asked questions and initiated conversation. Three additional scales asked the subject to rate the extent to which the confederate displayed interest in him, displayed warmth toward him and how generally positive she had responded toward him. Subjects also rated the degree to which they felt she would like to work with them in another experiment. Differential perception of social behaviour was not demonstrated. The only significant finding was in subjects' response to the item "I believe she would very much like working with me in another experiment." Low anxious subjects agreed with this statement more so than the high anxious subjects. The authors concluded that differences between high and low socially anxious subjects' performances may be more a factor of interpretation than their perception of social events.

Steffen and Reckman (1978) relied solely on self-report data to assess the differential perceptions of their subjects. The reasons for doing so are particularly unclear given that they had video-taped the subjects' interactions with the confederate. Behavioural observations may have revealed differences between groups in their responses to changes in the confederate's behaviour. Additionally, subjects' level of comfort or discomfort was not assessed. It was not clearly established that subjects in the high socially anxious groups were more anxious while interacting with the confederate than low anxious subjects. Another limitation of Steffen and Reckman's study was the absence of descriptive information regarding the positive and negative behaviours of the confederate. As a result, the actual nature of the
social stimulus remains unknown. In light of these limitations, it is
difficult to evaluate the significance of Steffen and Reckman's
findings.

The studies discussed thus far suggest that interactional variables
are a potentially reliable index for discriminating between socially
competent and incompetent groups. When a social situation is not held
constant (i.e. the partner's behaviour changes over the course of the
interaction), socially unskilled individuals can be distinguished from
socially skilled individuals on the basis of overt behaviour (Trower,
1980). Furthermore, socially anxious and nonanxious groups have been
shown to differ in their interpersonal styles of responding to others in
a social context; nonanxious individuals display greater synchronization
in responding to others than do anxious individuals whose responses
appear to be random and unrelated to social cues emitted by an

Taken as a whole, these findings indicate that when presented with a
standardized sequence of social cues, socially competent and incompetent
groups can be distinguished on the basis of response synchronization and
behavioural variability, measures which reflect the dynamic nature of
social interaction.

Nonverbal Communication and Social Anxiety

The relation between sensitivity to social cues and social anxiety
has only recently been investigated. As such the robustness of the
findings presented above has not yet been determined. Assessment and
procedural techniques are far from sophisticated. The choice of appropriate dependent measures and the construction of a credible and representative social context in which to assess process or interactional variables such as sensitivity to social cues require further empirical study. Finally, little is known about the particular social cues to which socially nonanxious individuals attend when interacting with someone. The research discussed above suggests that socially nonanxious individuals are more sensitive to their interpersonal partner's behaviour than anxious individuals. However, the basis of their sensitivity is not known. Given the recent impetus of research in this area, the significance of nonverbal communication in relation to sensitivity to social cues would appear to be an appropriate starting point at which to explore some of these issues in greater detail.

Nonverbal behaviour plays an important role in human communication. The significance of nonverbal communication is reflected in the numerous functions it serves. For example, nonverbal behaviour compliments verbal content by giving the listener some idea of the affective state of the speaker. When presented with messages in which nonverbal and verbal channels are contradictory, listeners tend to place more credence on nonverbal behaviours (Shapiro, 1968). Both tone of voice (Mehrabian & Wiener, 1967) and facial expression (Mehrabian & Ferris, 1967) have been implicated as of greater importance to observers than verbal content. Nonverbal behaviour is also a potent reinforcer. Eye contact, hand gestures and head-nods can, when used appropriately, act as
reinforcers during normal interactions to increase the frequency of
selected behaviours emitted by the other partner (Hargie, Saunders &
Dickson, 1981). An equally important function of nonverbal behaviour is
the regulation of the flow of communication between speaker and
listener. The pattern of gaze is particularly important in the
synchronizing of a social interaction (Argyle, Lalljee & Cook, 1968).
Finally, nonverbal behaviour is an important source of feedback. In
order to sustain communication, the participants must have a knowledge
of how their messages are being received. Goffman (cited in Argyle &
Kendon, 1967) described this process as the "working concensus" of an
encounter. Nonverbal behaviour provides the individual with cues
regarding the responses of the other person.

Given the significance of the nonverbal channel in communication, a
lack of sensitivity to nonverbal cues could lead to serious impairments
in social situations. Rosenthal et al (1979) developed the Profile of
Nonverbal Sensitivity Test (PONS) to assess individual differences in
the ability to decode cues in a variety of channels of nonverbal
communication. The PONS is composed of 220 film segments of 20 short
scenes portrayed by a young woman. The subject's task is to view each
segment and circle the label (one of two alternatives provided) that
correctly describes the scene enacted in the segment. Researchers found
that subjects scoring higher on the PONS also scored as better adjusted,
more interpersonally democratic and encouraging, less dogmatic, more
extraverted, more popular and more interpersonally sensitive as judged
by acquaintances, clients, spouses or supervisors. These findings are
interesting, however since social interaction involves the sending as well as receiving of messages, the PONS provides only limited information regarding differential sensitivity to nonverbal cues in situations where the recipient is a passive observer.

In a study conducted by Christensen et al (1980), sensitivity to nonverbal cues as a function of social competence was examined. Drawing from the literature concerning test anxiety and task performance, the authors hypothesized that socially unskilled persons would report greater self-preoccupation when compared to socially skilled persons. Furthermore, drawing from the same body of research, they hypothesized that anxiety, arousal and self-focusing tendencies in social situations would result in the reduction of an individual's ability to perceive cues displayed by others, in particular nonverbal cues which are generally subtle in nature.

Before discussing their research, an elaboration of the literature concerning the effects of anxiety on task performance will clarify the origin of their hypotheses. Test anxiety studies have supported Easterbrook's arousal-cue-utilization theory (in Sarason, 1980) which states in part, that anxiety reduces the range of task-relevant cues utilized in task performance. Wine (1971) has elaborated upon this idea by proposing that self-centered responses interfere with attention to task-relevant stimuli necessary for good performance. The self-preoccupied direction of attention in highly test-anxious persons in comparison to low test-anxious individuals is supported by a number of studies (see Sarason, 1980 for a review). Assuming a state of anxiety
arousal, Christensen et al (1980) predicted that "socially incompetent" individuals would display increased self-preoccupation and a subsequent narrowing of cue utilization similar to that of test-anxious subjects.

Fifteen high-competence female undergraduates and fifteen low-competence women were asked to engage in a structured interview with another student (a female confederate). Subjects were given a standardized set of questions to be used during the interview. Ten questions were provided for each of the three topics to be covered. Subjects were instructed that if their partner appeared uncomfortable with a particular set of questions, they should proceed to the next topic. The experimental manipulation involved the confederate displaying a series of nonverbal cues indicating tension during the second set of questions. During the first and third set of questions, the confederate portrayed a relaxed demeanor. Following the interview, subjects completed self-report scales to measure degree of anxiety, embarrassment, self-consciousness and how much they felt the confederate liked them.

Global ratings by the confederate and experimenter showed that the high and low competence groups did not differ in terms of their behaviour during the interview, however the high competence group terminated the second set of questions significantly earlier than the low competence group. None of the self-report measures yielded significant differences between the two groups. Postexperimental interviews indicated that both groups perceived tension in the confederate at the same point during the second question set. An
analysis of the reasons given by the low-competence group for not discontinuing indicated that subjects either felt the nature of the questions was not anxiety-provoking or that the tension was attributable to the experimental situation as opposed to the interview topic.

The researchers primary hypothesis was based on the assumption that socially incompetent individuals would experience greater anxiety and self-focussing tendencies in the experimental situation. Self-report measures indicated that the low competence group was not significantly different from the high competence group on either of these two measures. This investigation was not, therefore, an adequate test of their hypothesis. As suggested by Christensen et al. (1980), the highly-structured format of the interview situation may have been the reason for no differences in anxiety between the two groups. If subjects had been required to take more responsibility during the interview with the confederate, group differences may have resulted.

Summary

While clinical research has led to the development of treatment programs which have effectively reduced social anxiety, one of the major shortcomings in this area has been the lack of conceptual integration. Despite the quantity of data that has been generated, terms such as social incompetence, social skill and social anxiety have been used interchangeably in the literature. Insufficient attention has been given to defining these constructs and the nature of their relation. Consequently, clinical researchers are beset with the ominous task of
treated a disorder that has not been adequately defined.

In the current study, the term social incompetence is used to refer to social problems in general without specific reference to etiological or maintaining factors. The term social skill is used to describe the components of effective interpersonal behaviour. Social anxiety is defined as anxiety in social situations. It is suggested that socially anxious and socially unskilled individuals are not equivalent clinical populations. The focus of the present study is on the assessment of social anxiety. More specifically, this study examines the nature of the relation between a particular social skill and social anxiety.

For many years social psychologists have acknowledged and studied the relation between social cues and social interaction. A handful of clinical studies have shown that socially anxious individuals lack the ability to encode and decode social cues. The importance of nonverbal behaviour in human communication suggests that an inability to accurately monitor and respond to such cues can interfere with the maintenance of a social interaction. The current study investigates the relation between sensitivity to nonverbal social cues and social anxiety in order to further clarify the nature of this prevalent clinical problem.

Overview and Experimental Hypothesis

The research to be presented examines the relation between nonverbal sensitivity and social anxiety. Borrowing from the Trower (1980) methodology, a social interaction task involving a confederate
displaying changes in their behaviour was employed in order to avoid the difficulties encountered by Christensen et al (1980). It was expected that a less structured interaction task would be sufficiently involving so that highly anxious subjects would experience significant discomfort. Unlike the studies reviewed earlier, the investigation included verbal as well as nonverbal dependent measures. Researchers of nonverbal communication state that verbal and nonverbal components are so closely intertwined that they cannot be studied in isolation of one another. It is possible that individuals may display sensitivity to nonverbal cues emitted by their interpersonal partner using verbal and/or nonverbal channels.

The study was designed to test the hypothesis that socially anxious individuals are less sensitive to changes in the nonverbal behaviour of their interpersonal partner than socially nonanxious individuals. Sensitivity was defined as the ability to monitor and respond to changes in the nonverbal behaviour of an interactant. It was expected that socially anxious individuals would display less variability in their behaviour (verbal/nonverbal) across conditions in which their partner's behaviour changed than would socially nonanxious individuals.

This hypothesis was based on data indicating that socially anxious individuals engage in negative self-evaluations (Cacioppo et al, 1979) and fear negative evaluations from others (Smith et al, 1983; Watson & Friend, 1969). There is considerable evidence in the test anxiety literature to support the relation between self-focused attention or task-irrelevant cognitions and poor task performance (Wine, 1971).
Researchers have integrated this large body of literature within a distribution-of-attention model which states that self-focused attention interferes with attention paid to task requirements. The range of cues utilized in task performance is thereby reduced resulting in impaired performance (Sarason, 1980). In the case of social anxiety, individuals are attending to or evaluating their social performance as opposed to focusing on their interpersonal partner. Consequently, their ability to perceive and respond to cues displayed by others is reduced. Crozier (1979) refers to this conceptualization of social anxiety as "anxious self-preoccupation". In a comprehensive theoretical paper, Schlenker and Leary (1982) agree with Crozier's (1979) proposition that self-attention is an important component of social anxiety.

Empirical support for this model stems largely from correlational studies which relate task-irrelevant cognitions to social anxiety (Cacioppo et al., 1979) and treatment-outcome studies which indicate that modifying these cognitions can result in the reduction of social anxiety (Kanter & Goldfried, 1979). While the goal of this study is neither to prove nor disprove a model of social anxiety, confirmation of the hypothesis could lend support to Crozier's (1979) notion of anxious self-preoccupation.
Method

Subjects

Twenty-four socially anxious women (mean age 23.96) and twenty-four socially nonanxious women (mean age 23.25) participated in the study. Subjects were solicited on a voluntary basis from winter, spring and summer undergraduate classes at the University of British Columbia.

Subjects were screened for inclusion in the study using the Social Avoidance and Distress Scale (SAD; see Appendix A), a well-known trait measure of social anxiety developed by Watson & Friend (1969). The SAD is a 28-item self-report questionnaire which measures subjective distress and avoidance in social situations. Social avoidance is defined as avoiding being with, talking to or escaping from others for any reason. Social distress is defined as the reported experience of a negative emotion, such as being upset, distressed, tense or anxious in social interactions. Item content varies in terms of the sex of the person with whom the subject is interacting, his/her status relative to the subject, whether he/she is a friend or stranger and public and private conditions. K-R 20 homogeneity indices of .94 have been obtained and one-month test-retest reliabilities reported in the literature are .68 and .79 (Bellack & Hersen, 1979). The mean score for females is 8.23 and the standard deviation is 8.01. Subjects at least one half standard deviation above or below the mean (greater than 13 or less than 5) were included in the study. The socially anxious group had a mean score of 17.25 and a standard deviation of 3.05 while the socially nonanxious group had a mean score of 2.50 and a standard
deviation of 1.44.

According to the literature, there is a general consensus that depressed persons are less socially skillful than nondepressed persons (Youngren & Lewinsohn, 1980). Although the bulk of this research has focused on the interpersonal behaviour of depressed psychiatric patients, there is some evidence to suggest that social skill deficits are also present in depressed college students (Gotlib & Robinson, 1982; Jacobson & Anderson, 1982). In order to control for depression as an alternative interpretation of the data, the Beck Depression Inventory (BDI; see Appendix B) was employed to screen out moderately and severely depressed subjects. The BDI is a clinically derived self-report inventory of state depression which consists of 21 items covering affective, cognitive, motivational and physiological areas of depressive symptomatology (Beck, 1967). Bumbery et al (1978) determined that the BDI is a valid instrument for the measurement of depression in a university population. Subjects scoring 16 or higher, representing moderately and severely depressed individuals, were not used in the study. The mean score and standard deviation of the socially anxious group were 6.88 and 3.92, respectively. The socially nonanxious group had a mean score of 2.38 and a standard deviation of 2.75.

Apparatus and Setting

The experimental room consisted of three chairs, a small desk, and a book shelf. A videotape system that included a Sony video camera, a Sony solid-state video recorder, and a Sony television was used to
obtain records of the interactions. The video camera was positioned 12 feet away from the subject and confederate who sat facing one another with chairs turned slightly toward the camera.

**Procedure**

The SAD and BDI were distributed in undergraduate classes. Students who expressed interest in participating were asked to complete the questionnaires and informed that they would be contacted by phone to arrange a convenient time to take part in the study.

Subjects were met individually by the experimenter (a fourth year female undergraduate) who was blind to their condition. Due to the unexpectedly lengthy period of time required to run subjects, the principal investigator assumed the role of experimenter for 17 subjects collected during the summer months. Arrangements were made to ensure that the second experimenter was blind to the condition of these subjects. Upon arrival at the laboratory, subjects were asked to take a seat and informed that the second subject (a confederate) had yet to arrive. Several minutes later, the confederate arrived and was seated next to the subject. The experimenter then proceeded with the following introduction:

Social skills are very important in getting to know people and developing friendships. In this project, we want to assess your social skills and look at the different styles people use in getting to know someone new. There are two parts to this study. Firstly, I will ask you to get to know each other. There is no right or wrong way to act in this situation. Just do whatever you
would normally do when you meet someone for the first time. A
video camera will be used during this part of the study. All video
tapes will be kept confidential and will be seen only by
individuals working on the project. Following your conversation, I
will ask you to complete several questionnaires independently.
After completing the forms, I will answer any questions you may
have about the study.

The subject and confederate were then given consent forms which they
were asked to read and sign. Following this, the experimenter turned on
the video camera, instructed the subject to begin the conversation and
left the room.

The experimenter reentered the lab at the end of four minutes and
escorted the confederate to another room where she was supposedly
completing the remaining questionnaires. After filling out the
questionnaires, the subject was informally interviewed to check for any
suspicions regarding the experimental procedures and then fully
debriefed.

Confederate's Behaviour

Two female undergraduates were recruited to play the role of
confederate. Each student interacted with 24 subjects and remained
blind to the condition of each subject and the specific nature of the
experimental hypothesis. The confederate role was comprised of two
phases. In the relaxed phase, the confederate's behaviour included head
nodding, appropriate eye contact, expressive hand gestures, smiling and
a comfortable body posture. In the anxious phase, the confederate's
behaviour consisted of nonsignaling hand gestures (fingers twitching,
clinging hands, hands grabbing chair or braced unnaturally), poor eye
contact (infrequent and of short duration), movements of the mouth
(biting lips, mouth closed tightly) and posture shifts. These nonverbal
 cues were chosen on the basis of work done by Waxer (1979) who
identified a distinct nonverbal cue cluster associated with anxiety.
During both phases the confederate was minimally responsive to subjects'
questions and did not initiate conversation. Each phase was two minutes
in duration. The experimenter, who was outside the room during the
interaction, signaled the confederate at the end of two minutes by
coughing briefly. Subjects were randomly assigned to relaxed-anxious
and anxious-relaxed conditions.

A pilot study was conducted in order to ensure that the two phases
of the confederate's role were accurately discriminated by naive
observers. Throughout the data collection period, weekly training
sessions were held to minimize variations in the confederate's
performance and maintain a clear distinction between phases. Upon
completion of the data collection, observer ratings were collected by
two undergraduate judges using a 7-point scale to determine if the
selected nonverbal cues successfully conveyed relaxation and anxiety (1
= anxious, tense; 7 = relaxed, at ease).

**Measures**

Videotapes of the subjects' interactions with the confederate were
coded independently by two trained undergraduate judges who were blind
to the specific nature of the study. The following measures were
obtained:
Nonverbal-nonvocal behaviours. (a) observation - the fraction of each two minute interval when the subject looked at the confederate, whether or not it could be ascertained that the subject was making direct eye contact with the confederate; (b) posturing - the number of gross body shifts in each interval (i.e. leaning forward or backward against the chair, arms crossing, legs crossing, shifting position in chair in some way); (c) communicative gestures - the number of expressive hand gestures (hand movements which emphasize verbal content); (d) head nods - due to the difficulty of defining head nods in terms of discreet behavioural units, they were scored on the basis of occurrence/nonoccurrence over 5-second intervals.

Nonverbal-vocal behaviours. (a) number of pauses in each two minute interval (periods of silence lasting 5 seconds or more); (b) time spent talking.

Verbal-vocal behaviours. (a) situational statements - statements about the experimental situation; (b) self-disclosive statements - statements about self; (c) questions about the confederate's comfort/discomfort; (d) questions (excluding those regarding the confederate's comfort/discomfort).

Global ratings. Judges rated subjects on global measures of skill
(1 = not at all skillful, handles situation poorly; 7 = very skillful, handles situation effectively) and anxiety (1 = very anxious, tense; 7 = very comfortable, relaxed) based on the entire 4 minute interaction.

**Self-report measures.** After interacting with the confederate, subjects rated their own comfort/discomfort and that of the confederate using 7-point scales. Subjects were then asked to describe in their own words how their partner responded to them during their conversation. The resulting essays were read by two undergraduate judges (blind to the subject's condition and the specific nature of the experimental hypothesis) who bracketed off all references to specific overt behaviours, quotations of the confederate's statements, general descriptions of the confederate's interpersonal style, perceptions of change in the confederate's behaviour and statements about self.

Subjects' scores were calculated as the total number of statements that fell under each category with the exception of perception of change in the confederate's behaviour which was coded as either yes (the subject perceived a change) or no (the subject did not perceive a change). This measure was adopted from the work of Steffen and Reckman (1978) to assess subjects' attention to the confederate's behaviour during their interaction.

The pilot study revealed that in the majority of cases subjects were reporting their responses to the confederate instead of describing the confederate's behaviour. Consequently, a fourth measure was added
which asked subjects whether or not they observed a change in their partner's behaviour and if so, to describe what they observed. Judges coded subjects' responses as either yes (the subject perceived a change) or no (the subject did not perceive a change).\footnote{Before data collection was completed, two videotape cassettes were stolen. As a result, three dependent measures could not be coded. These were situational statements, self-disclosive statements and questions. Since this was not a replication study and these measures were not critical in testing the central hypothesis of the study, it was decided to proceed with data analysis without this information.}
**Results**

After all dependent measures were coded, it was observed that two variables demonstrated almost no variation across subjects. Quotations by the confederate, a measure used to categorize essay responses, and subjects' questions regarding the confederate's comfort during their interaction occurred in only 3 and 9 cases, respectively. Given the marked absence of information in these measures, they were not included in the subsequent data analyses and discussion.

**Inter-rater Reliabilities**

Table 1 lists the interrater reliabilities for the essay categories and videotape ratings. Pearson Product-Moment correlations were used to calculate agreement between judges.

The correlation coefficients for posturing and descriptive statements about the confederate low indicated only moderate reliability although all of other reliability coefficients are high. Although not indicated by the overall reliability index, judges' level of agreement increased substantially over the course of coding statements about the confederate. In the case of posturing however, the judges reported some difficulty in distinguishing gross body shifts from finer body movements. Given these moderate correlations, significant relationships based on posturing and statements about the confederate are considered suggestive and require further empirical verification.
Table 1. Interrater Reliabilities

<table>
<thead>
<tr>
<th>Essay Categories</th>
<th>Correlations (r)①</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=48</td>
</tr>
<tr>
<td>References to Specific Overt Behaviours</td>
<td>.95</td>
</tr>
<tr>
<td>Descriptive Statements about Confederates</td>
<td>.70</td>
</tr>
<tr>
<td>Statements about Self</td>
<td>.90</td>
</tr>
<tr>
<td>Perception of Change</td>
<td>.91</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Videotape Ratings</th>
<th>Correlations (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=48</td>
</tr>
<tr>
<td>Global skill</td>
<td>.83</td>
</tr>
<tr>
<td>Global anxiety</td>
<td>.81</td>
</tr>
<tr>
<td>Observation</td>
<td>.91</td>
</tr>
<tr>
<td>Posturing</td>
<td>.69</td>
</tr>
<tr>
<td>Gestures</td>
<td>.96</td>
</tr>
<tr>
<td>Nods</td>
<td>.91</td>
</tr>
<tr>
<td>Time spent talking</td>
<td>.96</td>
</tr>
<tr>
<td>Pauses (≥ seconds)</td>
<td>.89</td>
</tr>
</tbody>
</table>

① All correlations have p < .001
Confederates' Behaviour

Inter-rater reliability for judges' ratings of the two confederates across relaxed and anxious intervals was .85 using the Pearson Product-Moment correlation coefficient. The mean rating of relaxation for both confederates was 6.71. In the anxious interval, the confederates' mean ratings were 2.33 and 1.46. A 2(Intervals) X 2(Confederates) analysis of variance (ANOVA) yielded a significant main effect for intervals, \( F(1,92) = 2203.11, p < .01 \), for confederates, \( F(1,92) = 18.21, p < .01 \) and for their interaction, \( F(1,92) = 18.21, p < .01 \). The main effect for confederates and the interval by confederate interaction were due to the significant difference between confederates in the anxious interval. A 2(Confederates) X 2(SAD) ANOVA on subjects' perceptions of the confederates' degree of comfort or discomfort during their interaction was carried out in order to determine whether or not this statistical difference between confederates was perceived by subjects. There was no main effect for SAD, \( F(1,44) = 2.47, \text{ns} \), for confederates \( F(1,44) = 0.07 \) ns, or their interaction \( F(1,44) = 0.07 \), ns. The difference between the confederates in the anxious interval does not appear to have been a critical factor in subjects' perceptions of their interactions. Based on this analysis, the difference between confederates in the anxious interval as perceived by judges' ratings was not incorporated into the data analysis presented below.
Subjects' Global Skill and Anxiety

Judges' mean global ratings of social skill were 4.08 for the socially anxious group and 5.00 for the socially nonanxious group. A two-tailed t-test indicated that this was not a significant difference (p > .05). The socially anxious group had a mean global anxiety rating of 4.71 compared to 5.63 for the nonanxious group. This difference was statistically significant, t(46) = -2.06, p < .05. A t-test was performed on subjects' self-ratings of comfort/discomfort following their interaction with the confederate. Socially anxious subjects had a mean rating of 3.75 and nonanxious subjects had a mean rating of 5.00. This difference was also statistically significant t(46) = -3.41, p < .05. Lastly, two-tailed t-tests revealed a significant difference between self-ratings of comfort/discomfort and judges' global ratings of anxiety for the socially anxious group, t(46) = -2.11, p < .05, but not for the nonanxious group, t(46) = -1.75, p > .05.

In summary, these findings indicate that while objective judges did not observe a difference in the level of social skill displayed by socially anxious and nonanxious subjects, they did observe a difference on their levels of anxiety. The latter result is in agreement with socially anxious subjects' self-reports that they experienced greater anxiety during their interactions with the confederate than socially nonanxious subjects. However, anxious subjects perceived themselves as more uncomfortable than did objective judges. There was no such discrepancy between self-ratings and objective global ratings of anxiety for the socially nonanxious group.
Depression Scores

As reported earlier, the mean BDI scores for socially anxious and nonanxious groups were 6.88 and 2.38, respectively. A 2(SAD) X 2(Condition) ANOVA revealed a significant main effect for SAD, $F(1,44) = 20.70, p < .01$. The F ratios for the main effect for condition and the SAD X condition interaction were not significant. Based on this finding, BDI scores were incorporated into the main data analysis as a covariate.

Order Effects

A one-way multivariate analysis of variance (MANOVA) with repeated measures was conducted to determine whether or not the order in which the relaxed and anxious intervals were portrayed to subjects by the confederate had a significant effect, irrespective of subject group or interval. The MANOVA revealed a nonsignificant main effect for condition, $F(6,41) = 1.35$, ns (see Appendix C for summary table and figures). Additional analyses were carried out to investigate the relation between SAD, condition and interval. A 2(SAD) X 2(Condition) X 2(Interval) multivariate analysis of covariance (MANCOVA) with depression as the covariate showed a nonsignificant effect for the SAD

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Hotellings method for calculation of multivariate F's is used throughout the Results section (Winer, 1971).
X condition X interval interaction, $F(6,17) = .82$, ns. The SAD X condition interaction was also not significant, $F(6,17) = 2.15$, ns. Lastly, the multivariate F's for the SAD X interval interaction and the main effect for SAD were nonsignificant, although some univariate F's were significant. These latter two results will be discussed further in the next section. Given the absence of a significant relation between condition and SAD, and given that condition was counterbalanced across groups, order effects were not considered in subsequent data analysis.

Interaction Measures

A 2(SAD) X 2(Interval) MANCOVA with BDI scores as the covariate for repeated measures was employed to analyze nonverbal-nonvocal and nonverbal-vocal dependent measures (see Table 4). The main effect for SAD was nonsignificant, $F(6,40) = 1.58$, ns, however univariate F-tests indicated a significant effect for observation between groups, $F(1,45) = 7.45$, $p < .01$. The within-subjects factor (interval) produced a highly significant main effect, $F(6,41) = 7.37$, $p < .001$. According to the subsequent univariate analyses, the following measures produced significant effects across intervals: gestures, $F(1,46) = 18.56$, $p < .001$, nods $F(1,46) = 12.76$, $p = .001$, time talking, $F(1,46) = 26.29$, $p < .001$, and pauses, $F(1,46) = 10.71$, $p < .01$. The multivariate test for

1Hotellings method for calculation of multivariate F's is used throughout the Results section (Winer, 1971).
the SAD X interval interaction effect was nonsignificant, $F(6.41) = 1.27, ns$. Univariate F-tests did reveal a significant difference between groups in the relaxed interval for gestures $F(1,46) = 5.70, p < .05$.

Figures 4 and 5 summarize in graphic form the significant findings of this analysis. The socially nonaxious group spent a significantly greater amount of time observing the confederate across intervals compared to the anxious group. Furthermore, a change in the confederate's behaviour from relaxed to anxious resulted in significant decreases in the frequency of nods and gestures and time spent talking across groups. Socially anxious and non-anxious subjects also displayed a significant increase in number of pauses when the confederate's behaviour changed. Lastly, the analysis revealed that the nonanxious group gestured more frequently than the anxious group when the confederate was relaxed and displayed a significant decrease in gesturing when the confederate was anxious.
Table 4. Means and Standard Deviations for Repeated Measures between Groups

<table>
<thead>
<tr>
<th>Repeated Measures</th>
<th>Statistic</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Relaxed HSA&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Observation</td>
<td>M</td>
<td>81.96</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>31.53</td>
</tr>
<tr>
<td>Posturing</td>
<td>M</td>
<td>1.79</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.37</td>
</tr>
<tr>
<td>Gestures</td>
<td>M</td>
<td>6.29</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>8.74</td>
</tr>
<tr>
<td>Nods</td>
<td>M</td>
<td>4.58</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>3.78</td>
</tr>
<tr>
<td>Talking</td>
<td>M</td>
<td>43.46</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>17.01</td>
</tr>
<tr>
<td>Pauses</td>
<td>M</td>
<td>1.71</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.52</td>
</tr>
</tbody>
</table>

<sup>a</sup>n = 24  
<sup>b</sup>HSA = High Social Anxiety  
<sup>c</sup>LSA = Low Social Anxiety
Figure 4. Observation, posturing and gestures as a function of social anxiety and confederate's behaviour.
Figure 5. Nods, talking and pauses as a function of social anxiety and confederate's behaviour.
Post-Interaction Measures

A one-way MANCOVA across SAD using BDI as the covariate was conducted to analyze subjects' written responses collected following their interaction with the confederate. Table 5 presents a summary of the means and standard deviations for the post-interaction essay. The main effect for SAD was not significant, $F(3,43) = .454, \text{ ns}$. The results of the subsequent univariate F-tests were as follows: references to confederate's behaviour, $F(1,46) = 4.82, \text{ ns}$, descriptive statements about the confederate, $F(1,46) = .337, \text{ ns}$, and statements about self, $F(1,46) = .203, \text{ ns}$.

The two self-report measures used to assess whether or not subjects able to perceive a change in the confederate's behaviour were analyzed the chi-squared statistic. Table 6 summarizes the results of this analysis. There were no significant differences between socially anxious and nonanxious subjects on either measure. The z statistic (Johnson, 1976) was employed to examine within group differences across the probabilities of these two measures. The proportion of subjects who perceived a change in the confederate's behaviour was significantly greater for the socially anxious group, $z(0.05) = -3.75$, and the socially nonanxious group, $z(0.05) = -3.42$, when asked directly if they observed a change.
Table 5. Means and Standard Deviations
for Post-Interaction Essay across Groups (n=24)

<table>
<thead>
<tr>
<th>Coded Categories</th>
<th>Statistic</th>
<th>Social Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>References to Confederate's</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behaviours</td>
<td>M</td>
<td>1.58</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.75</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>1.89</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.17</td>
</tr>
<tr>
<td>Descriptive Statements about</td>
<td>M</td>
<td>5.29</td>
</tr>
<tr>
<td>Confederate</td>
<td></td>
<td>5.13</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.49</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.99</td>
</tr>
<tr>
<td>Statements about Self</td>
<td>M</td>
<td>2.63</td>
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Table 6. Corrected Chi-squared Statistics for Subjects' Responses to Perception of Change Measures

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<th>P</th>
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<td>6</td>
<td>18</td>
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<tr>
<td></td>
<td>LSA</td>
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a High Social Anxiety
b Low Social Anxiety
In summary, analyses of the post-interaction measures revealed no significant differences between the socially anxious and nonanxious groups in terms of the frequency of references to specific overt behaviours emitted by the confederate, descriptive statements regarding the confederate's interpersonal style, or statements about themselves while interacting with the confederate. Furthermore, no differences were observed when subjects' post-interaction essays were coded according to the absence or presence of the perception of a change in the confederate's behaviour. Finally, when specifically asked whether or not they observed a change in the behaviour of the confederate, both socially anxious and nonanxious groups showed a significant increase in the number of subjects who answered yes. However, there was no significant group effect on this measure.
Discussion

The results of this study do not support the hypothesis that socially anxious individuals are less sensitive to changes in the nonverbal behaviour of their interpersonal partner than socially nonanxious individuals when level of depression is controlled. Both groups reported observing a change in the confederate's behaviour according to their post-interaction self-reports. Furthermore, verbal and nonverbal interaction measures as rated by objective judges revealed a significant group X confederate's behaviour interaction on only one of six variables. The nonanxious group displayed a significantly greater decrease in the frequency of their communicative gestures when the confederate portrayed an anxious state compared to the anxious group. However, both socially anxious and nonanxious subjects displayed decreases in time spent talking, nodding, and gesturing as well as a significant increase in the number of pauses when the confederate appeared anxious.

In terms of absolute levels of behaviour, the nonanxious group spent more time observing the confederate than did the anxious group. Significant group differences were not obtained on measures of posturing, gestures, nodding, time spent talking or number of pauses. The failure of five of the six specific behavioural measures to differentiate between socially anxious and nonanxious individuals in the current study is consistent with the notable absence of reliable behavioural indices in past research. These findings lend support to the recommendation made by Fischetti et al (1977) that researchers
expand their empirical horizons beyond the measurement of simple frequencies in order to more fully understand the nature of social anxiety.

Judges' global ratings of subjects' skill and anxiety revealed no difference between groups in terms of social skill; however, a significant difference was observed in their levels of anxiety. Anxious subjects displayed greater levels of anxiety than their nonanxious counterparts. In addition, anxious subjects perceived themselves as more uncomfortable than did objective judges rating their degree of anxiety. This discrepancy between judges' ratings and subjects' self-reports was not observed for the nonanxious group. These results are consistent with previous findings in the literature (Clark & Arkowitz, 1975) and support the notion that behavioural indices are not adequate measures of social anxiety (Galassi & Galassi, 1981). The discrepancy between anxious subjects' self-reports and judges' global ratings suggests the presence of an 'interference mechanism' which is cognitive in nature (Curran, 1979). One possible explanation is that socially anxious individuals fear that they may be evaluated negatively by others (Watson & Friend, 1969; Smith et al, 1983) and as a result, experience greater anxiety.

There was a significant order effect across groups on the interaction measures. The pattern of findings for the order effects was variable and therefore not readily interpretable. An attempt to explain these results in relation to social anxiety would be conceptually confusing given this lack of consistency in the data. It is recommended
that the influence of a relaxed, then anxious interpersonal partner versus an anxious, then relaxed partner be examined independently of social anxiety before attempting to investigate the relation between social anxiety and systematic changes in the behaviour of an interpersonal partner.

Methodological Considerations

While the present study attempted to provide an experimentally sound test of the original hypothesis, there were a number of methodological shortcomings that should be considered when evaluating the findings. Firstly, the duration of the social interaction task was 4 minutes. Trower (1980) employed a similar experimental manipulation and obtained positive results; however, the interaction between the subjects and confederates lasted 12 minutes. Steffen and Reckman (1978) also used a naturalistic social interaction task but found no support for their hypothesis. The duration of the interaction task in their investigation was 6 minutes. It is possible that the shorter time durations used in Steffen and Reckman's study as well as the present study were only sufficient to demonstrate an expected decrease in the frequency of behaviours when individuals interact with an unresponsive confederate. On the other hand, a longer interaction period may have revealed a significant difference between socially anxious and nonanxious groups.

A second possible shortcoming of this study involves the choice of dependent variables. The interaction measures employed (posturing,
gestures, nods, observation, pauses, time talking) were limited to assessing changes in gross behaviours. More refined measures such as facial movements may have provided for the possibility of discriminating subtle behavioural responses. In terms of the global ratings of anxiety and social skill recall that judges rated each subject based on her overall performance during the interaction task. It remains unknown as to whether or not global ratings on these two dimensions following each 2 minute interval would have demonstrated differences between socially anxious and nonanxious subjects in their responses to the confederate's behaviour. Finally, a few comments are in order regarding the two post-interaction measures of the subjects' perceptions of change in the confederate's behaviour. Due to the retrospective nature of these measures, it was not possible to determine at what point subjects observed a change. Once again, had such data been obtained, it may have discriminated socially anxious and nonanxious groups on the basis of the immediacy or latency of their perceptions of the change in the confederate's behaviour.

Before leaving this discussion of methodological concerns associated with the dependent measures, it is important to take note of the difference in data obtained from the two perception of change measures. In the first instance, subjects were asked to describe in their own words how their partner responded to them during their conversation. The second measure was more direct and asked subjects the following question: "Did you notice a change in your partner's level of comfort or discomfort over the course of the conversation?" When asked
indirectly, 25% of the socially anxious group and 46% of the nonanxious group described a change in the confederate's behaviour. When asked directly, 79% of the socially anxious group and 92% of the nonanxious stated that they observed a change. While the differences between the two groups on either measure were not significant, the difference between the two measures was significant. It appears that the more direct measure acted as a cue which aided subjects in recalling the confederate's behaviour change during the interaction. Furthermore, this finding suggests that the indirect measure is not valid as an absolute measure of subjects' perceptions. In future, researchers in this area who chose to employ similar retrospective measures of subjects' perceptions must determine whether or not they wish to assess all perceptions made by their subjects or only those perceptions which are most immediately recalled by subjects.

One last methodological limitation of the present study which may have contributed to the negative findings was the role of the confederate. The shift from an anxious to relaxed state (or vice versa) was dramatic and therefore an unlikely representation of the typically subtle nonverbal cues that characterize social interactions. Had the confederate's change in behaviour been less obvious, the socially anxious group may not have perceived the change as easily as the nonanxious group.

Conclusions

In order to interpret the findings of the present study, they must
be examined not only in light of their methodological soundness, but in relation to the relevant research as well. The present study statistically controlled for the influence of depression as an alternative interpretation of the results. Depression was not controlled for in any of the relevant studies reviewed earlier. Ancillary analyses excluding depression as a covariate revealed that while differential sensitivity across groups was not demonstrated, the number of significant group differences on the interaction measures was substantially different. Socially nonanxious subjects spent significantly more time observing the confederate, nodding, and talking, and paused less frequently than did the socially anxious subjects. Furthermore, subjects' essay responses revealed that the nonanxious group recorded a greater number of references to specific overt behaviours emitted by the confederate than did the anxious group. These results underscore the importance of controlling for the impact of depression in studies investigating the nature of social anxiety. While the outcome of the present study remains unchanged when depression is statistically controlled, it remains an empirical question as to whether or not the findings of past research are strong enough to remain when the test of significance is more stringent.

Two of the three studies reviewed earlier which employed a live social interaction test to investigate the relation between sensitivity to social cues and social anxiety did not obtain differential sensitivity across groups (Steffen & Reckman, 1978; Christensen et al, 1980). Furthermore, these two studies and the present study selected
college students as subjects. In contrast to this, the third investigation which utilized a live social interaction test (Trower, 1980), selected subjects from a pool of psychiatric patients diagnosed as neurotic, phobic, and having personality disorders. Although Trower's findings supported the hypothesis that socially unskilled individuals are less responsive to situational cues than skilled individuals, the heterogenous nature of the subject sample and the use of verbal and nonverbal cues on the part of the confederates do not allow one to speculate on the relation between sensitivity to nonverbal social cues and social anxiety. Based on the findings of the current study and the relevant research, it appears that socially anxious individuals are no less sensitive to nonverbal social cues than socially nonanxious individuals.

Recommendations

While current findings do not support Crozier's (1979) proposition that self-attention is an important component of social anxiety, the theory of anxious self-preoccupation should not be abandoned prematurely. The experimental evidence suggests that social anxiety is not related to a decrease in sensitivity to nonverbal social cues. However, there is evidence to suggest that socially anxious individuals may be less sensitive to vocal cues when compared to nonanxious individuals. Fischetti et al (1977) and Peterson et al (1981) employed a prerecorded tape of a female voice to demonstrate that heterosexual-socially anxious
college students lack the ability to discriminate cues that guide the timing and placement of social responses. One possible direction for future research would be to test out the generalizability of these findings based on vocal dependent measures in the context of a live social interaction.

A second avenue for experimental inquiry stems from the negative results of the present study as well as those of Steffen and Reckman (1978) and Christensen et al (1980). In both structured and unstructured social situations, socially anxious individuals appear to have the ability to perceive nonverbal cues. However, it may be the case that socially anxious individuals interpret these cues differently than their nonanxious counterparts. Recall that in the Christensen et al (1980) study, socially competent subjects responded more immediately to cues of tension displayed by the confederate even though competent and incompetent groups became aware of the tension at the same point. Post-experimental interviews revealed that socially incompetent subjects tended to attribute the confederate's tension to situational factors versus the confederate's behaviour. Additional experimentation is needed to clarify the relation between social anxiety and perception, interpretation and responsivity.

Furthermore, the present study did not address the issue of sex differences. There is evidence to suggest that females are, in general, better decoders of nonverbal cues than males (Hall, 1978). Further research is needed to better understand the relation between sex and social anxiety.
APPENDIX A

Social Avoidance and Distress Scale
Social Avoidance and Distress Scale

The following questions are concerned with your beliefs, feelings, and actions. Decide whether each statement is more true or false as applies to you personally and circle either true (T) or false (F) after each.

Work quickly, giving your first reaction to each statement. If a statement is sometimes true and sometimes false, decide which is more typical of you personally.

1. I feel relaxed even in unfamiliar social situations.  T F
2. I try to avoid situations which force me to be very sociable.  T F
3. It is easy for me to relax when I am with strangers.  T F
4. I have no particular desire to avoid people.  T F
5. I often find social occasions upsetting.  T F
6. I usually feel calm and comfortable at social occasions.  T F
7. I am usually at ease when talking to someone of the opposite sex.  T F
8. I try to avoid talking to people unless I know them well.  T F
9. If the chance comes to meet new people, I often take it.  T F
10. I often feel nervous or tense in casual get-togethers in which both sexes are present.  T F
11. I am usually nervous with people unless I know them well.  T F
12. I usually feel relaxed when I am with a group of people.  T F
13. I often want to get away from people.  T F
14. I usually feel uncomfortable when I am in a group of people I don't know.  T F
15. I usually feel relaxed when I meet someone for the first time.  T F
16. Being introduced to people makes me tense and nervous.  T F
17. Even though a room is full of strangers, I may enter it anyway.  T F
18. I would avoid walking up and joining a large group of people.  T F
19. When my superiors want to talk with me, I talk willingly.  T F
20. I often feel on edge when I am with a group of people.  T F
21. I tend to withdraw from people.  T F
22. I don't mind talking to people at parties or social gatherings.  T F
23. I am seldom at ease in a large group of people.  T F
24. I often think up excuses in order to avoid social engagements.  T F
25. I sometimes take the responsibility for introducing people to each other.  T F
26. I try to avoid formal social occasions.  T F
27. I usually go to whatever social engagements I have.  T F
28. I find it easy to relax with other people.  T F
APPENDIX B

Beck Depression Inventory
Beck Inventory

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY! Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1  0 I do not feel sad.
   1 I feel sad.
   2 I am sad all the time and I can't snap out of it.
   3 I am so sad or unhappy that I can't stand it.

2  0 I am not particularly discouraged about the future.
   1 I feel discouraged about the future.
   2 I feel I have nothing to look forward to.
   3 I feel that the future is hopeless and that things cannot improve.

3  0 I do not feel like a failure.
   1 I feel I have failed more than the average person.
   2 As I look back on my life, all I can see is a lot of failures.
   3 I feel I am a complete failure as a person.

4  0 I get as much satisfaction out of things as I used to.
   1 I don't enjoy things the way I used to.
   2 I don't get real satisfaction out of anything anymore.
   3 I am dissatisfied or bored with everything.

5  0 I don't feel particularly guilty.
   1 I feel guilty a good part of the time.
   2 I feel quite guilty most of the time.
   3 I feel guilty all of the time.

6  0 I don't feel I am being punished.
   1 I feel I may be punished.
   2 I expect to be punished.
   3 I feel I am being punished.

7  0 I don't feel disappointed in myself.
   1 I am disappointed in myself.
   2 I am disgusted with myself.
   3 I hate myself.

8  0 I don't feel I am any worse than anybody else.
   1 I am critical of myself for my weaknesses or mistakes.
   2 I blame myself all the time for my faults.
   3 I blame myself for everything bad that happens.
0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.

0 I don't cry anymore than usual.
1 I cry more now than I used to.
2 I cry all the time now.
3 I used to be able to cry, but now I can't cry even though I want to.

0 I am no more irritated now than I ever am.
1 I get annoyed or irritated more easily than I used to.
2 I feel irritated all the time now.
3 I don't get irritated at all by the things that used to irritate me.

0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.

0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions than before.
3 I can't make decisions at all anymore.

0 I don't feel I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel that there are permanent changes in my appearance that make me look unattractive.
3 I believe that I look ugly.

0 I can work about as well as before.
1 It takes me extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.

0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.

0 I don't get more tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing almost anything.
3 I am too tired to do anything.
18  0  My appetite is no worse than usual.
     1  My appetite is not as good as it used to be.
     2  My appetite is much worse now.
     3  I have no appetite at all anymore.

19  0  I haven't lost much weight, if any lately.
     1  I have lost more than 5 pounds. I am purposely trying
     2  I have lost more than 10 pounds. to lose weight by eat-
     3  I have lost more than 15 pounds. ing less Yes  No

20  0  I am no more worried about my health than usual.
     1  I am worried about physical problems such as aches and pains; or
        upset stomach; or constipation.
     2  I am very worried about physical problems and it's hard to think
        of much else.
     3  I am so worried about my physical problems, that I cannot think about
        anything else.

21  0  I have not noticed any recent change in my interest in sex.
     1  I am less interested in sex than I used to be.
     2  I am much less interested in sex now.
     3  I have lost interest in sex completely.
APPENDIX C

Results of one-way MANOVA for Order Effects
Figure 1. Observation and posturing as a function of condition.
Figure 2. Gestures and nods as a function of condition.
Figure 3. Talking and pauses as a function of condition.
Table 2. Means and Standard Deviations for Repeated Measures across Conditions and Groups\(^{a}\)

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<td>LSA</td>
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<tr>
<td>(frequency)</td>
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\(^{a}\)\(n = 12\)
\(^{b}\)HSA = High Social Anxiety
\(^{c}\)LSA = Low Social Anxiety
Table 3. Summary of Univariate F-tests for Condition Effect

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Curran, J.P. & Gilbert, F.S. A test of the relative effectiveness of a systematic desensitization program and an interpersonal skills training program with date anxious subjects. *Behavior Therapy*, 1975, 6, 510-521.


