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# The effects of impression management demands on heart rate, self-reported social anxiety, and social competence in undergraduate males

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## Abstract

The effects of self-presentation demands were evaluated through conversational probe (CP) role-play tasks. Participants ( $N=29$ ) were required to manage their self-presentations (i.e., the impression they made, in each of two conditions). During high impression management (IM) demand, participants were evaluated on their performance. During Low IM demand, participants evaluated a confederate's performance. The High IM demand condition produced significantly higher heart rate (HR) and self-reported anxiety. HR and self-reported anxiety accounted for a significant amount of the variance in criterion measures of social competence. Greater social competence during High IM was associated with higher HR. Greater social competence during Low IM was associated with lower HR and lower self-reported anxiety. Although preliminary, these results suggest that uncontrolled IM demands contributed to mixed results found within and between social anxiety studies in the literature. Implications for the treatment of social anxiety are discussed. © 2001 Elsevier Science Inc. All rights reserved.

*Keywords:* Behavioral assessment; Psychophysiological assessment; Role playing; Social anxiety; Social skills

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## 1. Introduction

Few studies have simultaneously assessed relationships among self-reported social anxiety, physiological arousal, and social competence in different social

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situations. Using a variety of measures and a variety of social interaction tasks, have been assessed relationships among subsets of these variables with inconsistent results (Beidel, Turner, & Dancu, 1985; Cook, Melamed, Cuthbert, McNeil, & Lang, 1988; Dogde, Hope, Heimberg, & Becker, 1988; Glass & Arnkoff, 1989, 1994; Lang, Cuthbert, & Bradley, 1998; Turner & Beidel, 1985). Consequently, the roles of self-reported social anxiety, physiology, and social competence remains unclear.

Recently, Strahan and Conger (1998) found high levels of self-reported social anxiety to have no detrimental effects on participants' performances. High levels of social anxiety are often assumed to be correlated with high levels of physiological arousal. These results conflict with the prevailing performance deficit model (Gibbons, 1991; Hope, Gransler, & Heimberg, 1989; Ingram, 1990). However, social situations often have different self-presentation demands (Leary & Kowalski, 1995). No studies have as yet assessed these variables while controlling for the effects of self-presentation or impression management (IM) demands. IM demands may be key to understanding the inconsistent results found both within and between social anxiety studies.

The relationship between social anxiety and social competence is in need of conceptual and empirical work (McNeil, Reis, & Turk, 1995). The performance deficit model predicts that high anxiety impairs performance. Many assume that socially anxious persons are socially inept (Hope et al., 1989; Strahan & Conger, 1998). Social competence in socially anxious persons is thought to suffer due to the demands of increased self-focused attention, increased physiological arousal, and/or aroused affect (Gibbons, 1991; Hope et al., 1989; Ingram, 1990; Strahan & Conger, 1998). Physiological arousal and situational context play a role in the relationship between social anxiety and social competence, but this role is not fully understood.

Empirical findings relative to the relationship between social anxiety and social competence are mixed both within and between studies. Modest support has been found for the assertion that people with social anxiety show impaired social competence (Beidel et al., 1985; Clark & Arkowitz, 1975; Rapee & Lim, 1992; Stopa & Clark, 1993; Strahan & Conger, 1998). This relationship varies by social task (e.g. impromptu speech task, heterosexual social interaction, etc.) (Beidel et al., 1985). Self-focused attention appears to be detrimental only if participants already lacked confidence in their social abilities (Burgio, Merluzzi, & Pryor, 1986). Although participants in Strahan and Conger's (1998) study displayed degrees of social anxiety equivalent to that found in social phobics, they showed no deficits in social competence.

The evidence in support for social competence deficits in socially anxious persons is primarily based on males engaged in heterosexual social interactions. Nevertheless, these studies have all assessed social competence behaviors differently. Some used global ratings (e.g., a single rating to describe overall performance) (Beidel et al., 1985). Some used different sets of molecular behaviors (e.g., head-nodding, standing erect, gaze-aversion, eye contact, etc.)

(Glass & Arnkoff, 1989; McNeil et al., 1995; Walters & Hope, 1998). More recently, Strahan and Conger (1998) used middle level dimensions of content, verbal fluency, and nonverbal competence as well as a global rating. Paradoxically, differences have been found between anxious and nonanxious groups in molecular behaviors while at the same time finding no difference in the global quality of the social interactions (Beidel et al., 1985). Needless to say, it is difficult to draw conclusions from studies using different variables and obtaining conflicting evidence.

Most studies of social competence and social anxiety fail to incorporate specific linguistic and affective measures. Many have called for further inquiry into multi-modal measures of verbal and nonverbal conversational behaviors in order to reasonably compare social competence in social anxiety studies (Beidel et al., 1985; Glass & Arnkoff, 1989; Strahan & Conger, 1998; Walters & Hope, 1998).

Level of self-reported anxiety is often expected to correlate with physiological arousal. Socially anxious persons often display more physiological reactivity and more self-reported anxiety and fear in social situations than nonsocially anxious persons (Beidel et al., 1985; Borkovec, Stone, O'Brien, & Kaloupek, 1974; Turner, Beidel, & Larkin, 1986; Turner, Beidel, & Townsley, 1992). However, self-reported anxiety and fear measures do not correlate with physiological measures in many clinical and incarcerated populations (Lang et al., 1998). Unfortunately, few studies investigating relationships between social anxiety and physiological response have assessed a normative control sample.

Although often uncorrelated with self-report measures, physiological response reliably differentiate socially anxious patients from patients with other anxiety disorders, and from normal controls (Beidel et al., 1985; Borkovec et al., 1974; Lang et al., 1998; Rapee, Brown, Anthony, & Barlow, 1992; Turner et al., 1986; Turner, Beidel, & Townsley, 1992). Heart rate (HR), however, does not play a uniform role in social anxiety (Lang et al., 1998; Lang, Levin, Miller, & Kozak, 1983; Turner & Beidel, 1985). HR response is more reactive in socially anxious males during a heterosexual social interaction role-play than during a same-sex role-play or an impromptu speech task (Beidel et al., 1985). HR varies widely from person to person, but higher HR during exposure treatment, consistently undetected by self-report measures, remains highly predictive of successful treatment outcomes (Lang et al., 1998; Turner, Beidel, Long, & Greenjouse, 1992). Despite its variability, HR response is one of the most reliable physiological measures in the assessment and treatment of anxiety.

There are inconsistent results linking social anxiety with social competence as well as social anxiety with physiological arousal. There are also no published data describing relationships among social anxiety, social competence, and physiological arousal in nonclinical populations. Nevertheless, distinguishing normal control responses from anxious patient responses implies knowledge of normative physiological and self-reported anxiety responses to social situations. Additionally, distinguishing between related anxiety disorders on the basis of

social competence and self-reported anxiety also implies knowledge of normative social competence behaviors. Although studies have made these distinctions, no such normative data exist.

Behavioral assessment is highly related to context. Beidel et al. (1985) found situational factors to mediate physiological reactivity. However, the situational factor in the Beidel et al. (1985) study, although rationally driven, was not theoretically derived. Consequently, Beidel et al. (1985) proposed no theoretical relationships associating situational factors to physiological arousal, social competence behavior, and/or self-reported anxiety (Turner et al., 1986; Turner, Beidel, & Townsley, 1992). Whether the uncoupling of self-reported anxiety, social competence, physiology, and social situations across and within studies is ubiquitous, or a function of pathology, habituation, or uncontrolled variability in social situations remains unknown.

## **2. Self-presentation theory**

Self-presentation theory of social anxiety emerged from the study of non-clinical anxiety in social situations. The theory associates social anxiety with perceived situational factors. Incorporating aspects of the cognitive-behavioral model, self-presentation theory parsimoniously accounts for the full range of social anxiety experienced by clinical and nonclinical populations (Leary & Kowalski, 1995). Severity of social anxiety is accounted for by a quantitative increase in symptoms. No evidence of a qualitative difference between clinical and nonclinical populations exists at this time (Beidel et al., 1985; Glass & Arnkoff, 1994; Leary & Kowalski, 1995; Turner et al., 1986; Turner, Beidel, & Townsley, 1992). Thus, normative control responses to social anxiety can be cautiously, but reasonably, applied to clinical populations.

According to self-presentation theory, all people experience social anxiety in social situations when two conditions are present: The individual (a) possesses motivation to make a particular impression (good or bad), and (b) doubts that the desired impression successfully will be made (low self-efficacy) (Leary & Kowalski, 1995). Consequently, social situations where persons desire to make a particular impression have greater self-presentation or IM demands than social situations where persons are not so motivated. Salient evaluation of social performance and a perceived audience are known to increase IM demands (Leary & Kowalski, 1995). Self-presentation theory provides a theoretical foundation for inducing increased social anxiety as a manipulation by invoking a demand for IM.

This study utilized a nonclinical population of male undergraduates in two social situations: (a) High impression management (High IM), and (b) Low impression management (Low IM). During High IM demand, participants were evaluated on their performance. During Low IM demand, participants evaluated a confederate's performance. The High IM condition was anticipated to induce

higher state anxiety and higher HR than the Low IM condition. Molecular, middle level, and global multi-modal measures of linguistic and affective behaviors utilized elsewhere (Penn et al., 1999; discussed in Penn, Corrigan, & Racenstein, 1998) and similar to those used by Strahan and Conger (1998) were obtained for each participant during each condition. Congruent with the performance deficit model and some previous research, participants with the least self-reported anxiety, the least fear of social situations, and lowest HR in both conditions were expected to demonstrate the highest social competence.

### **3. Method**

#### *3.1. Participants*

Participants were 29 undergraduate males recruited from psychology classes at a Chicago metropolitan area university. Participants received extra credit in exchange for participation. Participants were 53% white, mean age 21 years, with a mean of 14 years of education.

#### *3.2. Measures*

##### *3.2.1. Heart rate*

HR measures were collected continuously throughout the experimental conditions. HR was sampled at 2 Hz relayed through a Coulbourn 8-bit analog-to-digital convertor (L25-08) to Labtech Notebook software on a personal computer. HR was measured with a photoplethysmographic sensor placed on the center of the distal phalanx of the left index finger. The HR signal was processed through a Coulbourn Pulse optical Densitometer (S71-40) and a Coulbourn Tachometer (S77-26). HR was calculated by subtracting baseline beats per minute from post-role-play beats per minute for each participant in each condition.

##### *3.2.2. Subjective Units of Distress (SUDS)*

A SUDS (1–100) was used as an indirect measure of state anxiety. Participants were trained in the use of the anchored scale and made aware of a SUDS poster affixed to the wall next to the participant's chair for reference. In addition to baselines, SUDS data were collected before and after each condition. Participants were instructed to base post-role-play SUDS ratings on the highest level of anxiety experienced during the role-play. SUDS ratings were calculated by summing baseline SUDS and post-role-play SUDS for each participant in each condition.

##### *3.2.3. Fear Questionnaire — Social Phobia (FQ-Social)*

The Fear Questionnaire includes a Social Phobia subscale (FQ-Social) which is commonly used in social anxiety research (Marks & Mathews, 1979; McNeil et

al., 1995). The FQ-Social includes five anxiety-producing situations that are rated on a Likert type scale (0–8) for degree of avoidance. The FQ-Social has demonstrated moderate to high internal consistency and appropriate discriminate validity (Oei, Moylan, & Evans, 1991).

### 3.2.4. *Impression Scale (IS)*

The IS is a five-point Likert type scale with the following four items: (a) Social Skills, Poor to Good; (b) Content of Conversation, Uninteresting to Interesting; (c) Friendliness, Unfriendly to Very Friendly; and (d) Attractiveness, Unattractive to Very Attractive. The IS was created to underscore the need to evaluate the confederate in the Low IM condition and increase the IM demand in the High IM condition.

### 3.2.5. *Social skills assessment*

The following molecular social skills were rated on anchored five-point Likert type scales ranging from 1 (*Poor*) to 5 (*Good*): (a) Overall social skill; (b) Clarity, the clear enunciation of speech; (c) Fluency, smoothness of speech, absence of verbal interruptions such as “uh,” stutters, etc.; (d) Affect, the appropriate communication of feeling through facial expression, use of gestures, voice tone, etc.; (e) Gaze, eye contact; and (f) Involvement, the extent to which the individual appears involved in conversation with the confederate. Asks questions was rated on a Likert scale with a range from 1 (*None*) to 5 (*Many*).

Social competence was assessed by two research assistants unfamiliar with the study, the participants, and the experimental conditions. Raters were trained on 20 conversational probes (CP's) drawn from a library of role-plays from previous research (Penn, Hope, Spaulding, & Kucera, 1994). When an ICC coefficient of greater than .70 was achieved, the CPs from the present study were rated.

Assistants rated the first CP for all participants first, followed by the second CP for that participant. They were unable to refer to previous ratings. ICCs were averaged across the two conditions and were above .90 for all molecular social skills ratings.

Consistent with previous research (Penn, Meuser, Spaulding, Hope, & Reed, 1995), molecular social skill ratings were combined into three middle level composite indices of social competence by summing standardized *z* scores for each skill: (a) Verbal Social Skill (VSS)=the sum of Overall Social Skill and Asks Questions; (b) Nonverbal Social Skill (NSS)=the sum of Affect, Involvement, and Gaze; and (c) Paralinguistic Social Skills (PSS), the sum of Fluency and Clarity. Also consistent with previous research, the three indices appear to share a moderate degree of variance (see Table 1) (Penn et al., 1999).

VSS, NSS, and PSS indices were also summed to obtain global competence ratings in order to compare global competence ratings from other studies, to control for the overlapping variance apparent in the middle level indices, and to assess the degree of aggregate variance accounted for by the predictor measures (see Table 3).

Table 1  
Low IM condition Pearson *r* correlation matrix

	HR	SUDS	FQ-Social	VSS	NSS	PSS
HR	1.00	-.26	-.30	-.54*. <sup>#</sup>	-.30	-.32
SUDS		1.00	.42*	-.20	-.15	-.22
FQ-Social			1.00	-.16	-.32	-.33
VSS				1.00	.61*. <sup>#</sup>	.61*. <sup>#</sup>
NSS					1.00	.49*
PSS						1.00

HR = heart rate; SUDS = Subjective units of distress scale; FQ-Social = Social Phobia subscale on the Fear Questionnaire; VSS = Verbal Social Skills; NSS = Nonverbal Social Skills; PSS = Paralinguistic Social Skills.

\* Denotes significance ( $P < .05$ , two-tailed).

<sup>#</sup> Denotes significance after a Bonferroni correction ( $P < .003$ , two-tailed).

### 3.3. Procedure

After informed consent was obtained, participants were seated in a reclining chair, electrodes were attached, and video taping was initiated. An 8-min habituation period followed. Participants were trained in the use of the SUDS (1–100). Baseline SUDS and HR data were collected.

Participants then took part in two sequential videotaped CP role-plays corresponding to the High and Low IM conditions, each with a different confederate. CP requires the participant to initiate and maintain a conversation with a stranger for 3 min (Mueser et al., 1996; Penn et al., 1995). The confederates, undergraduate females, were trained to employ standardized prompts during the conversation (e.g. “Tell me about your family?”) if a period of 5 s elapsed after the confederate had spoken and the participant had not responded.

In the Low IM condition, participants were told that the confederate was the focus of the evaluation, that she was instructed to make the best possible impression, and that they were to evaluate her using the IS. In the High IM condition, participants were told that they were the focus of the evaluation, to make the best impression possible on the confederate, and that the confederate as well as a research assistant would evaluate them using the IS. IS was shown and read to the participants who received the High IM condition prior to the Low IM condition. Each condition was followed by a 3-min recovery period. Confederate participation and order of conditions were counterbalanced across participants.

Upon completion of the last recovery period, the participants were administered the FQ-Social and videotaping ceased.

## 4. Results

Two paired samples *t* tests were conducted to ascertain whether the High IM condition indeed succeeded in inducing greater social anxiety than the Low IM

Table 2  
High IM condition Pearson *r* correlation matrix

	HR	SUDS	FQ-Social	VSS	NSS	PSS
HR	1.00	-.22	-.36	.38*	.53*.#	.26
SUDS		1.00	.41*	-.17	-.13	-.24
FQ-Social			1.00	-.31	-.39*	-.13
VSS				1.00	.85*.#	.37
NSS					1.00	.42*
PSS						1.00

HR = heart rate; SUDS = Subjective units of distress scale; FQ-Social = Social Phobia subscale on the Fear Questionnaire; VSS = Verbal Social Skills; NSS = Nonverbal Social Skills; PSS = Paralinguistic Social Skills.

\* Denotes significance ( $P < .05$ , two-tailed).

# Denotes significance after a Bonferroni correction ( $P < .003$ , two-tailed).

condition. With an  $\alpha$  level of .05, SUDS and HR were indeed significantly higher in the High IM condition, SUDS,  $t(28) = 2.29$ ,  $P = .03$ , and HR,  $t(28) = 2.60$ ,  $P = .02$ . The mean summed SUDS for the High IM condition was 83.20 while the mean summed SUDS for the Low IM condition was 71.72. Mean HR (beats per minute) increase during the High IM condition was 5.02 while the mean HR increase during the Low IM condition was 1.72. The High IM condition produced significantly more anxiety and physiological arousal than the Low IM condition.

To assess relationships among the independent and dependent measures, a correlation matrix was calculated for each IM condition utilizing the Bonferroni correction procedure. An  $\alpha$  of .003 was required for significance (see Tables 1 and 2). A series of backward stepwise multiple regression analyses was then performed to determine the extent to which predictors (HR, SUDS, FQ-Social) accounted for variance in the criterion measures of social competence (Global, VSS, NSS, PSS; criterion probability of  $F$  to remove  $\geq .10$ ). Models to predict social competence were tested.

In the Low IM condition, higher social competence was predicted by lower HR and less self-reported anxiety. HR and the FQ-Social were retained in a model predicting 39% of the variance in global social competence. HR and SUDS ratings were retained in a model accounting for 37% of the variance in VSS. HR and FQ-Social were retained in a model accounting for 22% of the variance in NSS. HR and FQ-Social were again retained in a model accounting for 25% of the variance in PSS (see Table 3). In the Low IM condition, greater social competence was consistently associated with lower HR and lower self-reported anxiety.

In contrast, during the High IM condition, greater social competence was predicted by higher HR. HR was the only predictor retained in a model predicting 20% of the variance in global social competence. HR accounted for 11% of the variance in VSS and 26% of the variance in NSS. In this condition, greater social



Table 3  
Multiple regression analyses predicting indices of social competence

Social competence index	Variable	<i>B</i>	S.E. <i>B</i>	$\beta$	<i>P</i> value	Adjusted $R^2$
<i>Low IM</i>						
Global	HR	− 0.38	0.10	− .61	<.01	
	FQ-Social	− 0.33	0.10	− .49	<.01	.39
VSS	HR	− 0.18	0.05	− .64	<.01	
	SUDS	− 1.9	0.01	− .37	.02	.37
NSS	HR	− 0.13	0.05	− .43	.02	
	FQ-Social	− 0.14	0.06	− .45	.02	.22
PSS	HR	− 6.83	0.03	− .46	.01	
	FQ-Social	− 7.50	0.03	− .47	.01	.25
<i>High IM</i>						
Global	HR	0.41	0.14	.48	.01	.20
VSS	HR	0.14	0.07	.38	.04	.11
NSS	HR	0.21	0.06	.53	<.01	.26
PSS	HR	5.72	0.04	.26	.18 ns	.03

HR = heart rate; SUDS = Subjective units of distress scale; FQ-Social = Social Phobia subscale on the Fear Questionnaire; VSS = Verbal Social Skills; NSS = Nonverbal Social Skills; PSS = Paralinguistic Social Skills.

competence was associated with higher HR regardless of self-reported anxiety (see Table 3).

## 5. Discussion

Results from the Low IM condition supported the proposed hypothesis and the performance deficit model. In the Low IM condition, social competence decreased as self-reported anxiety and physiological arousal increased. There was a substantial overlap in the variability accounted for by the FQ-Social and the SUDS. Increased self-reported anxiety and increased physiological reactivity appear to contribute to decrements in verbal, nonverbal, paralinguistic, and global social competence in situations in which the interpersonal IM demands are low. Beidel et al. (1985) also found a trend toward decrements in overall social skill ratings associated with increased self-reported anxiety and arousal during heterosexual social interaction tasks and impromptu speech tasks. These results suggest that greater social competence during a Low IM demand social situation requires lower physiological arousal and as well as lower perceived anxiety.

In contrast, results from the High IM condition did not support the performance deficit model and the proposed hypothesis. In fact, findings were in the entirely opposite direction. During High IM demand, greater social competence was associated with greater physiological arousal, and were unrelated self-

reported anxiety. Consistent with Strahan and Conger's (1998) findings, social competence behavior was not associated with self-reported anxiety. The higher physiological reactivity during the High IM condition is consistent with Beidel et al. (1985) findings of higher arousal during heterosexual social interaction role-plays, a relatively High IM social situation. These results suggest that higher arousal during a High IM demand situation contributes to social competency.

Examination of the relationships among anxiety, physiology, and social competence revealed that demand for IM inherent in the social situation is an important mediating factor in relationships among such variables. This study of normative participant responses suggests that normative social competence behavior is associated with different physiological responses in social situations with different IM demands. Individuals in social situations where the task demands High IM require higher physiological arousal in order to demonstrate social competency regardless of the level of self-reported anxiety or fear of social situations. In contrast, individuals in situations where the social task demands Low IM require lower physiological arousal and less perceived anxiety to demonstrate social competency. Interestingly, what appears to be an inconsistent relationships among anxiety, physiology, and social competence within and between studies in the literature may be, in part, a function of uncontrolled IM task demands in the social situations in which behavioral assessments occurred.

Although preliminary, these results have important implications for the treatment of social anxiety, as they offer an estimate of the normative response in different social situations. During treatment of social anxiety, it is common to role-play problematic social situations (Butler & Wells, 1995; Heimberg & Juster, 1995). According to these results, varying IM demands in social situations requires attention to different sets of appropriate physiological and anxiety responses in order to provide for optimal social competence behaviors. For instance, during a social task in which IM demands are quite high, such as asking for a date or public speaking, focusing only on decreasing physiological reactivity and anxiety may not facilitate optimal socially competent behaviors because a certain level of arousal is associated with competence with this type of social task. However, during a social task in which IM demands are low, such as having an informal conversation with a neighbor, attending to a decrease in physiological reactivity and anxiety may facilitate optimal socially competent behaviors.

Our results are limited by several factors. A larger *N* may have provided additional power to account for a greater amount of variance in the High IM condition as well as provided for the addition of more predictor variables. There are probably other measurable factors accounting for the difference in variances found in the High and Low IM conditions that were not available in this study. A concurrent assessment of cognitive factors would have added to our understanding of the results. A replication, of course, is needed. Additionally, demographic features of the sample were fairly circumscribed. There is a need to examine both males and females in clinical and community samples in order to learn more about these processes and possible treatment implications as well.

Future inquiry is also needed to elucidate the parameters of an “optimal” physiological response to different social situations, if it exists. Further explication as to why self-reported anxiety appears unrelated to social competence behaviors in High IM conditions is needed as well. Further development and standardization of induced IM demand would assist in the comparison of results in future studies. And, of course, further development and standardization of molecular, middle-level, and global social competence measures are needed so that researchers and clinicians can properly compare social competence behaviors across studies.

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